

ELECTRIC RAILWAY JOURNAL

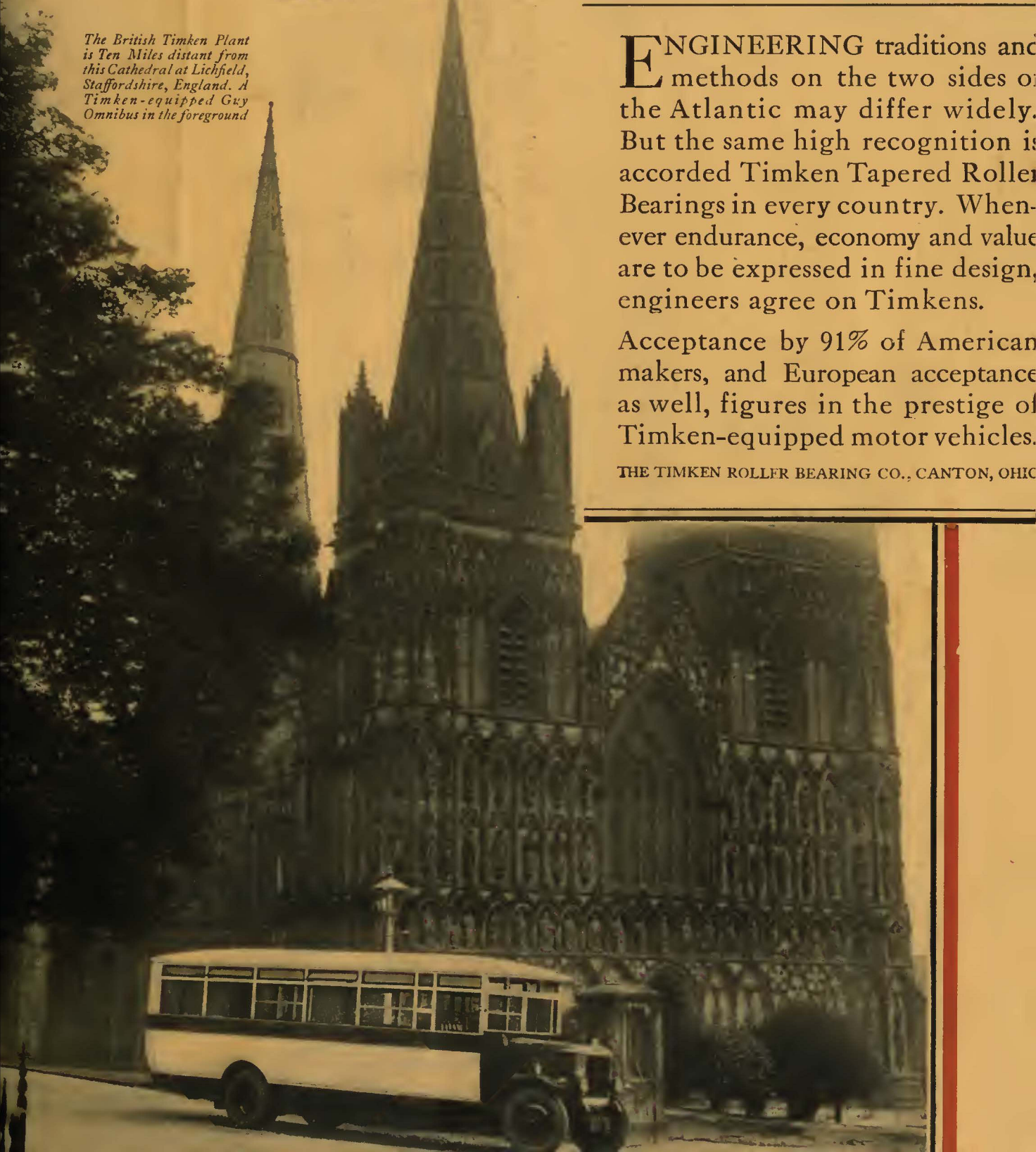
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From the Coffin Award Briefs

IT WOULD obviously be a considerable task for any electric railway executive to dig out for himself the new developments disclosed in the voluminous briefs filed for the Coffin prize competition. Nevertheless every progressive operator is vitally interested in this annual array of accomplishments.

For that reason ELECTRIC RAILWAY JOURNAL has made it an annual practice to publish, soon after the convention, a complete abstract of the winning brief, together with the new developments disclosed by each property entering the competition. The brief of the Pennsylvania-Ohio Electric Company, which won the 1926 award, was published in the JOURNAL of Oct. 16. Some of the new practices developed in Baltimore appear in this issue. Next week's JOURNAL will be devoted very largely to articles presenting new ideas developed by the other contestants.

To save the reader's time, practices that have already been published are not repeated. Some of the contestants this year found it convenient to use clippings or reprints from the JOURNAL as exhibits in their briefs. Since the Coffin Award Foundation is prepared again this year to publish a complete résumé of the material from all the briefs in book form, the JOURNAL confines itself to presenting to the industry promptly only the essentially new things disclosed by the various contestants.

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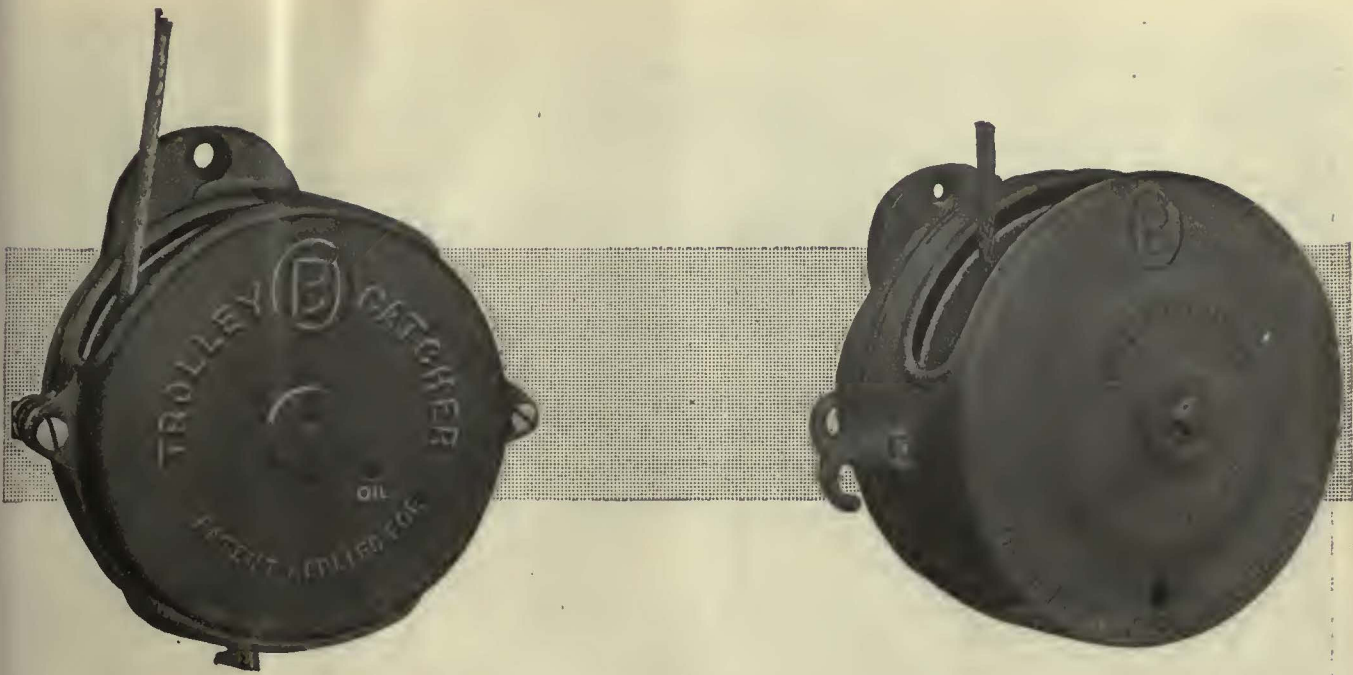
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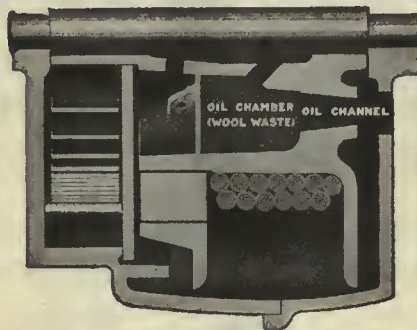


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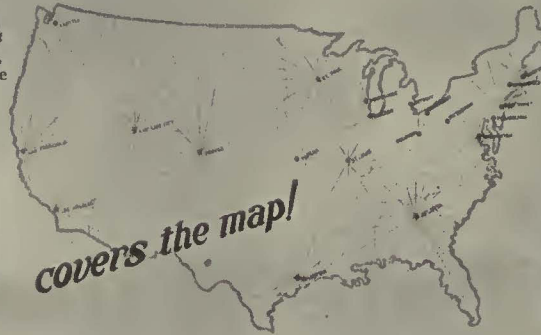
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Westinghouse Automotive Air Brakes are standard factory equipment on one or more classes models produced by the following automotive manufacturers.

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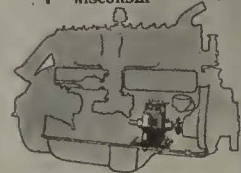


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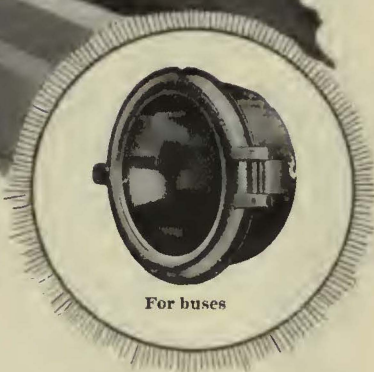
- increased patronage is attracted by rapid highway transportation that embodies the traditional railway security.
- faster schedules result from the ability to make shorter stops smoothly.
- life and property are safeguarded by a powerful, yet easily-controlled retarding force, developed without driver fatigue.
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For electric railway cars



For buses

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Relief from Paving Burdens

Three states and a number of municipalities have relieved electric railways from paving burdens, according to a recent Bulletin of the American Electric Railway Association. In most instances the relief granted was the cancellation of all paving and repaving requirements except the track foundation and damage to surface paving occasioned by operation of cars.

Companies thus relieved from surface paving can eliminate the question of tie and paving maintenance by installing *Steel Twin Tie Track*—a permanent foundation. Steel Twin Ties in concrete cost no more than most other track designs. Steel Twin Ties in concrete will outlast the rail. Steel Twin Ties and concrete require a minimum of maintenance during the life of the rail.

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The International Steel Tie Company
Cleveland, Ohio



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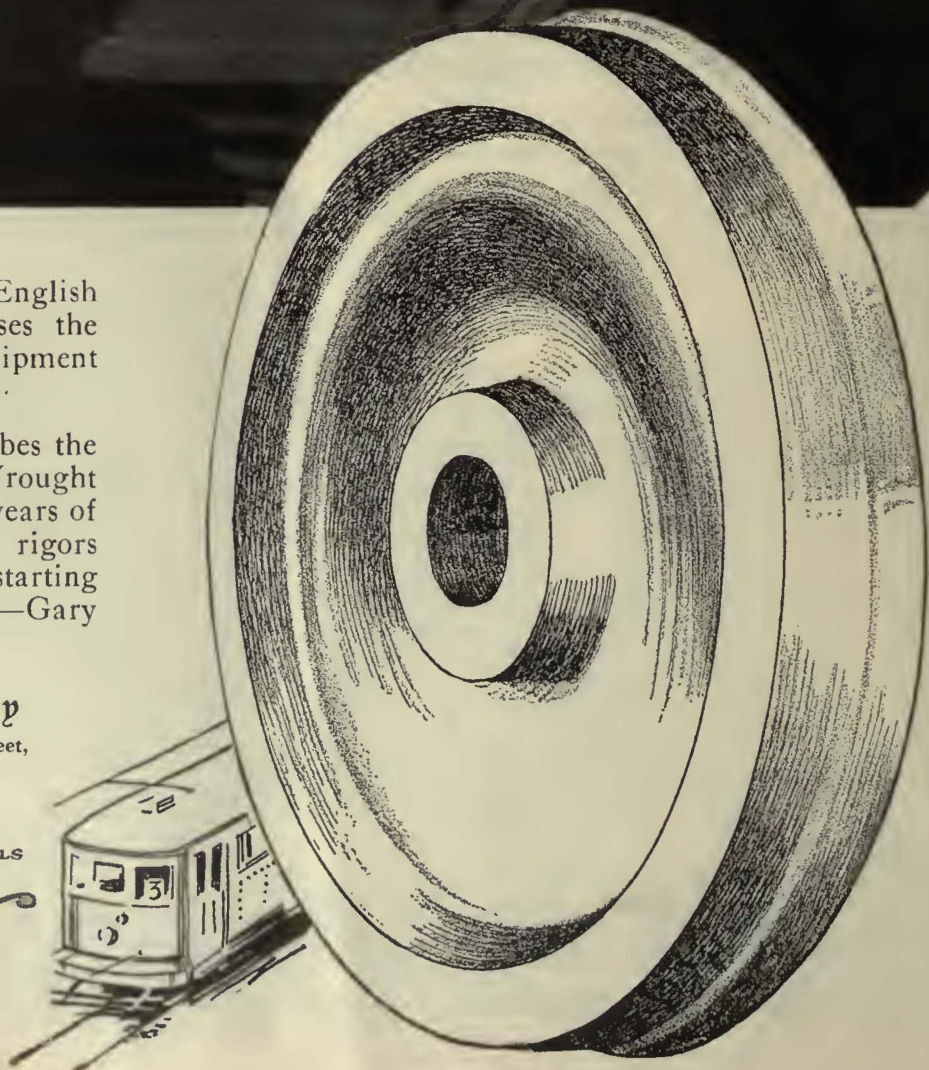


"Go!" No word in the English language so aptly expresses the need of electric railway equipment in peak periods.

And no word better describes the co-operation of Gary Wrought Steel Wheels. Rendering years of service—withstanding the rigors of frequent stopping and starting as only wrought steel can—Gary Wheels always say "Go."

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AN IMPORTANT PIECE OF MECHANISM

WITH the exception of the air brakes, the controller and the power mechanism, no piece of apparatus on a car is in use so many times each day as the door and step controlling mechanism. With such constant operation, the door engine *has* to be a durable and simple piece of apparatus—both easy to maintain and un-failing in performance. The National Pneumatic Company, therefore, has developed door and step controlling systems as dependable, as durable, as simple and as easy to maintain as any other piece of mechanism that is vital to car operation. These systems, as a consequence, have become a standard in modern car specifications.

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Light on the Bus Braking Question

The ABC's of Bus Brakes and Braking Systems

Compressor Mountings and Drives. There are three general types of compressor mountings.

Front end: mounted on the front cover plate of the vehicle engine and driven direct from an eccentric on the main crankshaft.

Side: mounted beside the vehicle engine and driven by gears, chains, belts, an auxiliary shaft, or some combination of these.

Transmission: mounted beside the transmission and driven through gears from a special power take-off.

The Side and Transmission mounted compressors are not difficult to install and can be put on practically any vehicle. However, if the compressor is efficient, trouble usually develops in the drive, particularly on the Side mounted type. The pulsating compressor load wears gears, chains, and universals rapidly. Chains and universal renewals are common, and where the timer is driven from the same shaft timing trouble appears. The Transmission-mounted compressor is less subject to drive trouble as only gears are used and of course no timer or other trouble can develop from it. However, it is inclined to become noisy and is not the simplest or most satisfactory installation.

The Front-end mounting and drive is by far the simplest and most rugged. When installed it is practically a part of the motor and not a piece of auxiliary apparatus. An eccentric on the main engine crankshaft drives it. There are no gears, chains or universals. The compressor hasn't even a crankshaft of its own. It has less than half the number of parts contained in any self contained or auxiliary compressor. Vibration is reduced to the lowest possible point because the pulsations are absorbed by the main engine crankshaft and bearings—those designed for the heaviest duty.

Not all motors at present can take a front-end mounted compressor, but wherever possible it is much to be preferred from every standpoint—installation, operation and maintenance.

This is the seventh of an informative series on Bus Brakes. The series consists of:

- A—What Brakes Must Do.
- B—How many wheels should brakes go on?
- C—Self-equalization and brake adjustments.
- D—Curing the skid.
- E—Metal to metal or molded linings?
- F—Braking Power.
- G—Compressor Mountings and Drives.
- H—Compressor Cooling.
- I—The Control Valve.
- J—Maintenance on Different Types.

These topics will appear in the above order. Address any comments, suggestions or requests for advance information to:

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During this period maintenance was reduced from 21.2 per cent of gross revenue to 13.6 per cent. Power costs were reduced from 12.8 per cent of gross revenue to 8.8 per cent; and total operating cost from 36.2 per cent to 28.8 per cent. Such figures speak for themselves. They are directly attributed to new car operation under none too favorable conditions. Cincinnati NEW Cars are in service today on many well-known properties. And in *every* case they have proved successful.

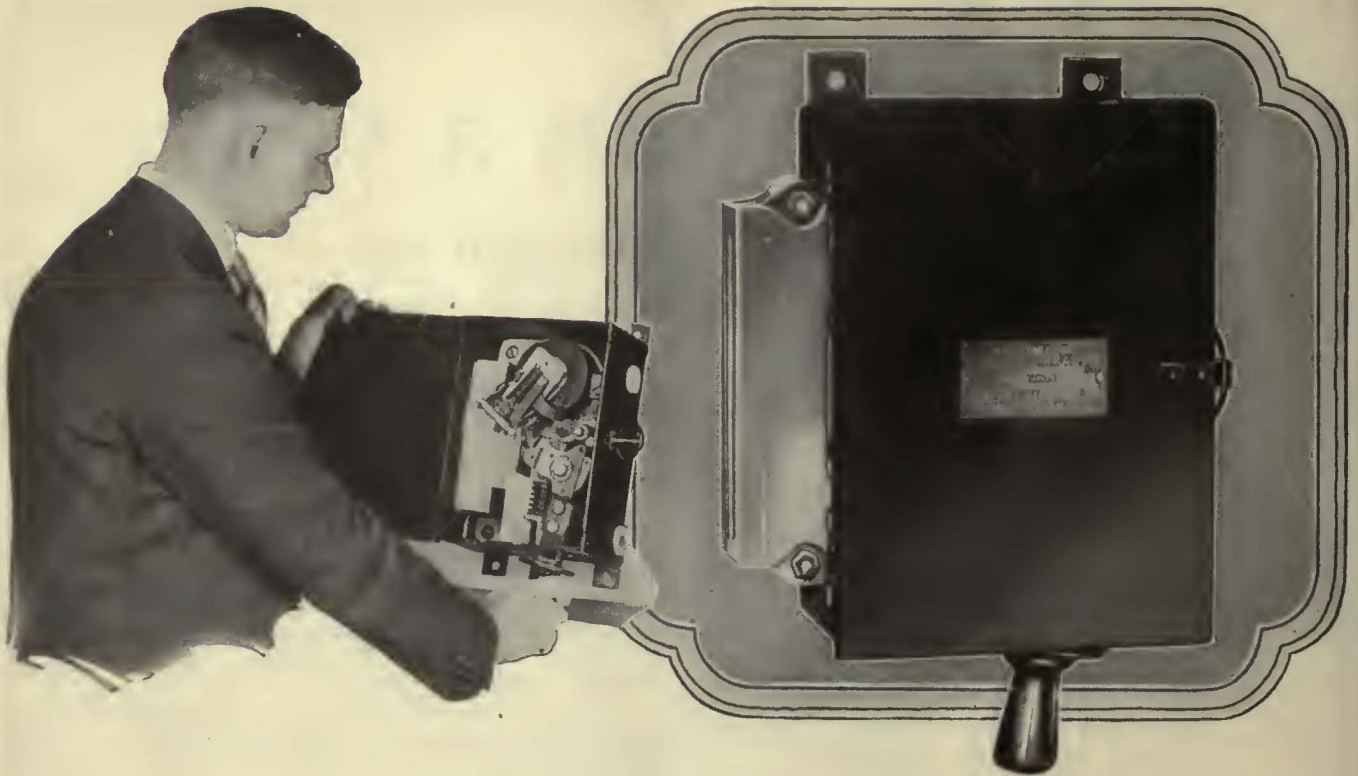
Full details, blueprints of Cincinnati NEW Cars and operating data on request.

THE CINCINNATI CAR COMPANY
CINCINNATI, OHIO

CINCINNATI
New
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A step ahead of the modern trend



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You will be impressed with the improvements that so plainly indicate superiority in this Circuit Breaker, as compared with obsolete types.

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Most important of all, its quick action and superior contact-breaking mechanism give *better* protection to costly car equipment.



There comes a time when equipment grows old in point of service, when the cost to maintain it becomes excessive. As you review the advantages of this *modern* type-MR Breaker, consider also the lowered maintenance costs that would result from replacing your obsolete types.

Ask your G-E Office to send you this MR Breaker for inspection or trial.



For
Modern Equipment Standards

GENERAL ELECTRIC

Electric Railway Journal

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

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 68

New York, Saturday, October 30, 1926

Number 18

The Bus Case Is Sound Provided Its Import Is Understood

REPRESENTATIVES of the Bus Division of the R. A. A. have recently submitted to the Interstate Commerce Commission their views regarding the principles that should govern interstate bus regulation. Boiled down, these include two primary contentions: First, that interstate bus operation is essentially a local matter and should be regulated by the state commissions in the states affected; second, that bus transportation is an industry in its own right, that it is an addition to the sum total of transportation facilities offered the public and that it should be regulated regardless of its effect on existing carriers.

Most transportation men are agreed with the first principle set down, namely, that interstate bus operation in its present stage of development is essentially a local matter and of interest primarily to the states concerned. It is also probable that bus operation of the scheduled common carrier variety will always remain largely a local service. Although long distance operations may be expected to expand in the next few years, these operations will be of the special party or tour variety rather than regularly scheduled common carrier service. In this form of bus operations the elements of pleasure and sightseeing are large factors in determining the character of the service rendered. Time and cost are secondary rather than primary factors. Such service, if properly developed under competent and responsible management, offers an attractive substitute for tours in individually owned machines and may be expected to draw its passengers from that source rather than from existing common carriers. Thereby it fulfills the primary requirement for being considered a transportation service in its own right. It offers an entirely different character of service at rates needed to maintain quality and reliability. Such operations seem to fall outside the classification of common carriers on fixed schedules and routes.

In considering bus operations which fall within the limits of common carrier service the question of whether these operations should be judged on their own merits without regard to existing carriers depends entirely on what the nature of the operations is to be. If the bus service is merely a duplication of the rail service on highways, both in the character of operations and rates of fare, then the bus contention is entirely unfounded and the existing carriers should most decidedly be considered in judging the necessity for the new service. Under such conditions bus operations are merely a duplication of existing facilities and represent an economic loss to the community.

When two vehicles are operated where one was operated before, with no corresponding increase in traffic, some one stands to pay the piper, and that some one is the man who buys transportation service. Under

such conditions the bus does not offer something new, but merely tears down something which already exists. Only when a rail carrier is consistently operating at a loss, and when it is established that such operations cannot be made profitable, is the substitution of buses for rail service justified. Surely bus men are themselves in a delicate position when advocating that no consideration be given the existing carriers in determining the necessity for a new bus line, for what is sauce for the goose is also sauce for the gander. If the mere desire for more transportation is to become ample basis for granting certificates to operate, then the holders of existing certificates of convenience and necessity are indeed the possessors of nothing more than scraps of paper. Carrying this reasoning to the *reductio ad absurdum*, a maximum amount of service would be provided on a given route by granting operating rights to all who applied.

But would it? What about the character of the service rendered? And what about the cost of giving the service? That is where this reasoning falls down, for duplication of service in kind represents economic waste, and when there is economic waste in rendering utility service the user pays the bill, either in his fare or in being forced to put up with an inferior ride.

Bus operations may be considered in their own right without regard to existing carriers only when the service rendered is of an entirely different character at rates high enough to insure maintenance of the quality. When the bus service offers a different *character* of service at distinctive rates it represents an addition to transportation facilities and not a duplication. Under such conditions the bus creates its own patronage instead of drawing from the riders on the existing carriers. *And the rate of fare charged is the key to the situation.* With the rate of fare sufficiently higher than railway rates and with both regulation and competition operating to keep the character of service rendered up to the level of the rate charged, then the bus, even when operated parallel to an existing carrier, seems to have some claims for being considered a transportation agency in its own right.

The bus men cite the example of telephone and telegraph service as precedent on which to base their own case. Consideration for a moment of the difference in the character of these services and of *the rates charged* shows the situation in its proper light. Though these are both communication services the telephone has not attempted to duplicate the telegraph, but provides a service that is entirely different in character at an entirely different rate. The bus has before it a wonderful future, provided that its own advocates rise to their opportunity. It is high time that bus men stopped thinking in terms of railway passengers, railway rates and railway replacement and devote themselves to building what they claim to represent—an industry in its own right.

Plans for Next Year's Convention Should Be Made Early

NOW while the thoughts of the 45th convention are still fresh in mind, it is a good time to think about the 46th. In previous years, the location has been decided some time during the late winter or spring, leaving only a short time before active work commenced.

Many companies, both manufacturing and operating, are making their budgets for next year. The location of the convention has a decided bearing on such estimates. Then, too, the work of several committees of the association, such as that on membership, will find it advantageous to approach prospective members with definite plans.

Few people realize the great volume of work behind the preparation of a convention having the enormous proportions as that just witnessed in Cleveland by more than 8,000 delegates. That, of course, is a compliment to those who prepared it. Nevertheless, besides the work of the convention committee and the director, there is much necessary work on the part of manufacturers that could in a measure be better directed if focused on a definite objective.

Also, the date bears some thought. The first week of October has for years been chosen. The reason for this seems to be tied into the more or less stereotyped Atlantic City schedule, fitting in with hotel accommodations, etc., following the season's rush to that resort. In Cleveland these factors did not prevail. The accountants, principally, are affected, since the first of the month is obviously the busiest time for them and this has been a factor that has been responsible for preventing many delegates of this important association from attending.

With the ever-growing size of the annual convention and its increasing importance in this period of the industry's recovery it seems particularly advisable to plan earlier that we may plan better.

Make Better Use of Existing Streets Before Spending Money to Widen Them

IMMEDIATE widening of roads in and about the large cities of the United States is being vigorously urged by the American Road Builders Association as a means of relieving traffic congestion. The enormous expenditure necessary for such an undertaking is justified, it is claimed, because the cost of traffic delays is greater than would be the cost of widening and improving the roads. Despite the plausibility of this argument considerable uncertainty exists as to the actual measure of relief that would be afforded by simply increasing roadway areas. So far as city traffic is concerned, experience shows that additional street space is absorbed as rapidly as it is provided without any marked diminution of congestion. Before spending vast sums to widen the streets, careful consideration might well be given to the possibilities of making better use of those we already have.

Observation clearly shows that the actual capacity of existing streets has by no means been reached. The volume of traffic that can be moved over a given route in a given time depends on the effective width of the roadway and the average speed of vehicles. Generally speaking, both can be increased with comparative ease.

On our busiest streets parked automobiles often occupy anywhere from a quarter to two-thirds of the roadway. Angle parking and double parallel parking

are permitted in the very cities where the gravest concern is felt concerning the traffic situation. Huge vans back up to the curb and spend hours loading or unloading regardless of the extent to which they block the movement of other vehicles.

To make matters worse the average speed of vehicular movement in many streets has become so slow that the horse is replacing the automobile for certain kinds of trucking in our large cities, because the cost of waiting is thereby reduced. A tremendous number of unnecessary delays occur. Time and again a single vehicle making a left-hand turn blocks two or three lines of moving traffic. Policemen frequently exercise poor judgment in controlling traffic at busy intersections. On the other hand, automatic synchronized signal lights often hold large numbers of vehicles motionless although there is no cross traffic moving.

Whether or not a program involving wholesale widening of roads is desirable is not for the electric railway industry to say. In the cities, however, results are likely to be disappointing if it is undertaken on the theory that traffic congestion will thereby be substantially relieved. Unless provision is made to restrict the use of widened streets to traffic movement rather than the storage of vehicles, there will be an increase in storage space but little real improvement in facilities. Making more efficient use of the existing roadway, rather than building more roadway to use inefficiently, offers a quicker and better solution of the problem.

Light for Electric Railways in Professor Ripley's Criticisms

THE latest article in the series by Prof. W. Z. Ripley on corporate finance published in the *Atlantic Monthly* appears in the November issue of that magazine and undertakes to throw light on the financial practices occasioned by the rapid growth of the power and light industry. Approaching this question from the standpoint of the public's interest, Professor Ripley confines his discussion to the holding company. After setting up what he considers the weaknesses and dangers attending the rapid growth of these organizations, the author deserts his customary high plane of scientific inquiry and yields to the temptation of becoming rhetorical. This is done by inferring that some of the conditions described are sufficiently general to warrant federal investigation. That is obviously unfair. To an industry which has made such phenomenal progress there is bound to be attracted the speculator who stretches the limits of sound practice. There is ample evidence—and the author cites some of it—to indicate that those engaged in building for the future as well as the present have decried some of the very practices which are criticized.

Although discussing primarily the power and light industry, and particularly the situation of the holding companies, the article touches a few points of interest to electric railway men. Little cause to quarrel can be found with the professor in contending that sale of stock direct to customers carries with it the assumption of increased responsibility by the utility and that this activity should be properly safeguarded in the public interest, as well as in the interest of the utility itself. But in the case of the electric railways there is little danger for some time to come of "overselling" securities direct to the public. At the present time the principal problem of the electric railways is that of re-establish-

ing their credit. However, this is a good time for the industry to fix in mind the responsibilities as well as the advantages that attend the sale of stock to its patrons.

Electric railways have had considerable experience with the evil results of inadequate provision, during a period of adequate rates and profits, for depreciation and obsolescence. During periods of prosperity, when there is no question of increased rates involved, there is a natural disposition on the part of regulatory authorities to permit adequate reserves to be set up. The precedents thus established are extremely important to the preservation and development of the industry in leaner years. There is now a growing realization in the electric railway industry that failure to set aside adequate depreciation allowances in the past is responsible for the large amount of obsolete equipment on its hands today. Now that there is strong evidence of steadily improving conditions it is important that a definite policy be adopted as rapidly as possible looking to the establishment of adequate renewal reserves. Only in that way can the industry hope so to preserve its plant and equipment as to meet effectively the conditions set up by modern transportation requirements.

New York Five-Cent Referendum Act Defective

ELECTION day in New York, Nov. 2, will not see the question of a 5-cent fare referendum submitted to the voters. The Court of Appeals has effectually squelched any such proposal. The matter had been passed upon before by the lower courts, but only as to the regularity of the proceeding, not on any of the technical points involved.

So an end has been put to an obnoxious piece of legislation sired by former Mayor Hylan and nurtured by former Comptroller Craig. Although these gentlemen were anathema or worse one to the other in office, they appeared in the rôle of Damon and Pythias in this little piece of hokum, which fixed the citizens' attention upon the 5-cent fare alone. The unrevealed effect, however, would have been to prohibit action by the authorities, thus making transit contracts immune to change.

The opinion of the court was to the effect that if there was a shred in the law that could be saved, it was not worth saving. Consequently it declared it to be folly to submit this "maimed and worthless thing" to the voters. In other words, as it now stands revealed the legislation was an attempt to fool the public into the belief that a vote was merely a vote for or against the 5-cent fare. This deceit was continued even in the form of the question to be printed upon the official ballot which mentioned only the fare.

In New York there has never been a clean-cut expression of public opinion on the vitally important questions of an independent subway system and municipal operation. By this bill a neat trap was laid to trick the people into a vote that (without their knowing it) meant an independent system and municipal operation, because with agreements between the city and the existing companies practically prohibited, no other course than municipal operation would be possible. The bill that the courts have scotched by their action would have perpetuated the present transit conditions in New York, made intolerable by the very people who, not content with their work of opposition while in office, sought by this impudent means to bedevil things still further.

All the Noise Is Getting Nowhere

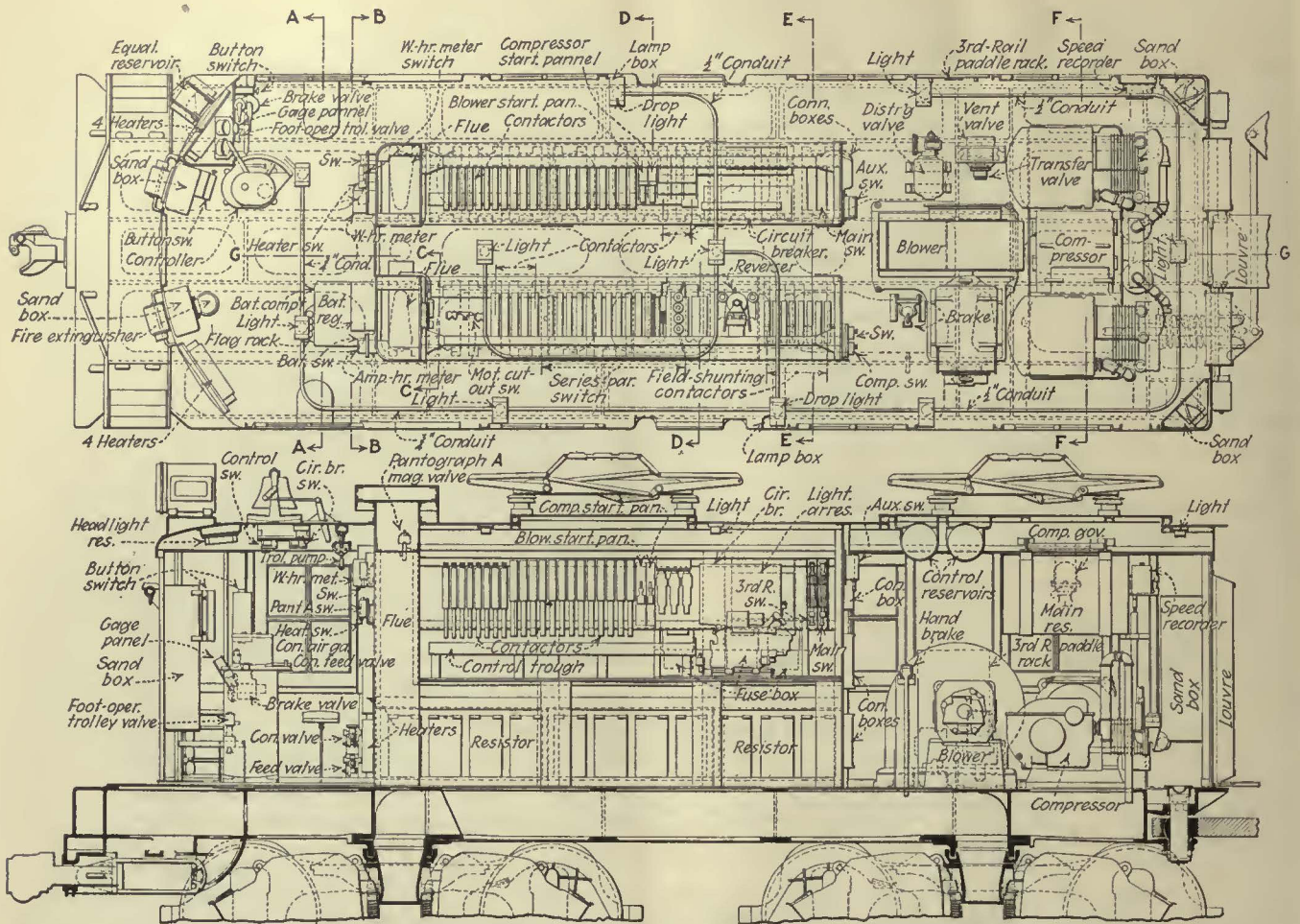
ANY disposition, if such there really be, by the two major steam railroads of Pennsylvania to enter into competition in kind by the operation of buses in territory already served by the electric railways or by other legalized carriers deserves to be condemned, but it does seem that the over-zealous Governor Pinchot, in refusing to sanction charters for subsidiary bus companies sponsored by these railroads, has gone out of his way to malign the Public Service Commission. The Governor pretends to foresee the steam carriers swallowing up the present highways to their own aggrandizement, and then proceeds intemperately to lash the Public Service Commission.

Off hand, the correspondence between the Governor and the commission over the matter might make it appear that the controversy is a purely local one, grounded in a manifest disapproval of the personnel of the commission as now constituted, but it really goes deeper than that. It is an indirect attack on regulation itself. The commission appears to be cognizant of the need on its part to protect the existing carriers from encroachment one upon the other. The Governor says, however, that if he were to sign the railroad bus subsidiary charters, the commission could grant certificates of public convenience without anybody's being able to stop it. There has, however, been no evidence of this. Any such action on the part of the commission would probably be in direct violation of the rights of the existing carriers, provided, of course, that these carriers are prepared to meet their contractual obligation.

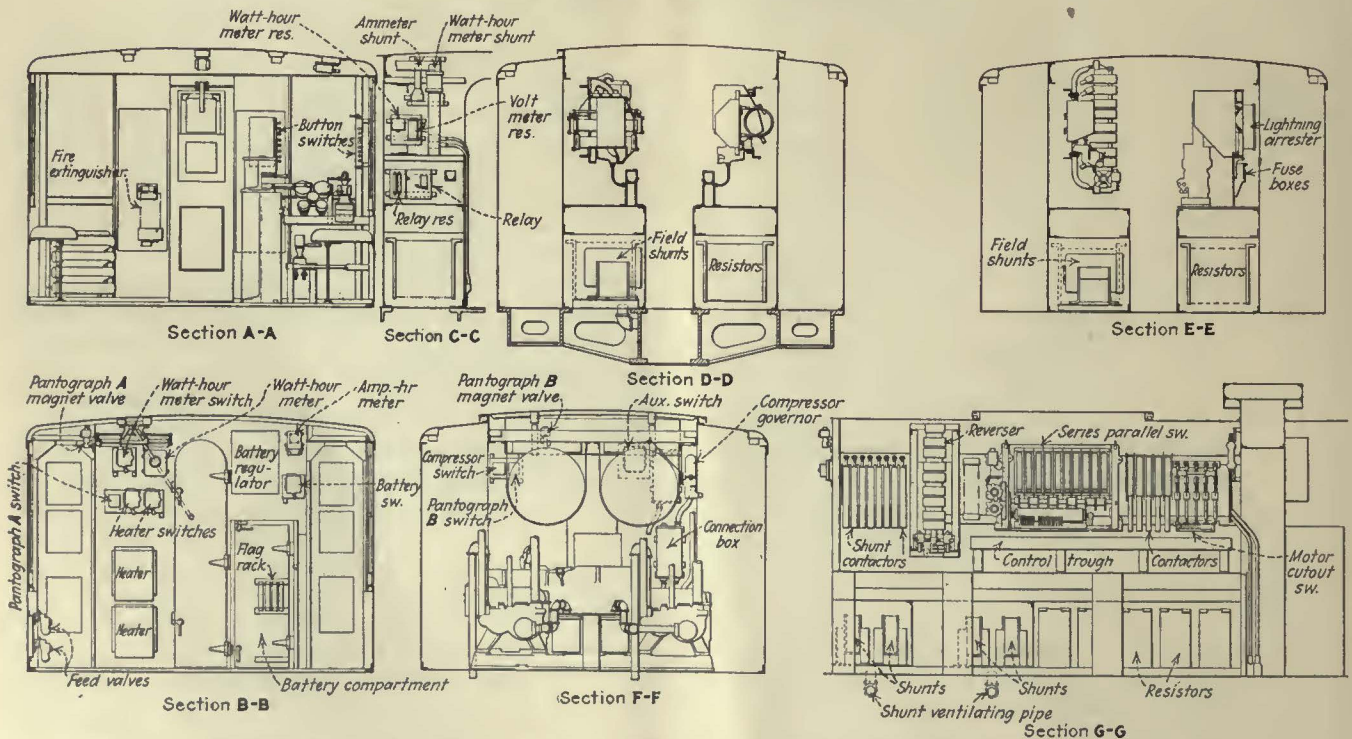
Still the fear that the Governor purports to feel is shared in other quarters. This is made plain in a statement by Powell Evans, president of the Schuylkill (Electric) Railway, Girardville, published on Oct. 20. Reference to this statement is made elsewhere in this issue. It deserves careful attention not only in Pennsylvania but in other states. Mr. Evans says that the electric railways urged the facts upon the steam railroads patiently and temperately before the bus programs of these companies were finally adopted, but without effect, "whereupon protest was made to the Governor, the Public Service Commission and the courts, with the result that the charters were denied." He says that the electric railways throughout the state "propose to resist to the utmost the unjustifiable aggression initiated by the steam lines against established, responsible and equally legitimate local competitors."

In other words, here is a situation in which a Governor pretends that the members of the Public Service Commission cannot be trusted to protect the rights of the small against encroachments by the large corporations, in which the commission says that each applicant for the right to operate must prove his case, and in which the electric railways have been unable to impress the steam railroads with a point of view they rightfully regard as reasonable. With due respect to all the parties involved, it certainly would seem that nothing can be gained by further blind adherence, particularly on the part of the steam railroads, to the policies that have so far marked the progress of this controversy. The very mutuality of their interest ought perforce to bring the steam railroads and the electric railways together to devise a plan eminently fair to each. It is not the first time this has been found to be the only adequate way to avoid consequences terrible alike to the carriers and the public.

New Electric Engines Weighing More than 170 Tons Placed in the Freight Service of New York City



Floor Plan, Above, and Sectional Elevation, Below, Show the Layout of Equipment that is Mounted Above the Cast-Steel Floor Frame of This Latest New York Central Electric Locomotive. Air Ducts Between Blowers and Propulsion Motors Built in as Integral Parts of the Floor Frame



Five Cross-Sections Shown Above Illustrate the Compact Grouping of Apparatus. In the Lower Right-Hand Corner is a Partial Longitudinal Section Showing the Control Assembly

New Electric Freight Locomotive Placed in Service by New York Central

Two Units Just Received Perform Well Within Specification Limits—Designed to Operate from Third Rail or Overhead Construction of Present Type or that Contemplated on West Side Tracks—Three Running Connections Are Provided with Two Steps of Inductive Field Shunts, Allowing Nine Running Speeds with Full Load Varying Between 4 M.p.H. and 24.8 M.p.H.

By Edwin B. Katte

Chief Engineer Electric Traction, New York Central Railroad

THE New York Central Railroad's new electric freight locomotives are designated as Class R and will be used for hauling through freight on the electric division and west side freight tracks in New York City and vicinity.

These engines, two of which have been purchased, differ from any previous electric locomotives of the company in that they are built in two nearly identical units. The units are connected by a special coupling and can be separated for shop purposes, but are numbered alike and will not be separated in service. The designed weight was 170 tons, the actual scale weight of the first locomotive is 353,600 lb., all on the drivers. In an illustration is shown the general outline of the locomotive and the principal dimensions.

Each unit consists of a box type cab mounted on two four-wheel swivel trucks, not articulated. The floor



More than 100 Cars Weighing 3,000 Tons Were Hauled by This New Engine Between New York and Harmon at Varying Speeds up to 34½ M.p.H.

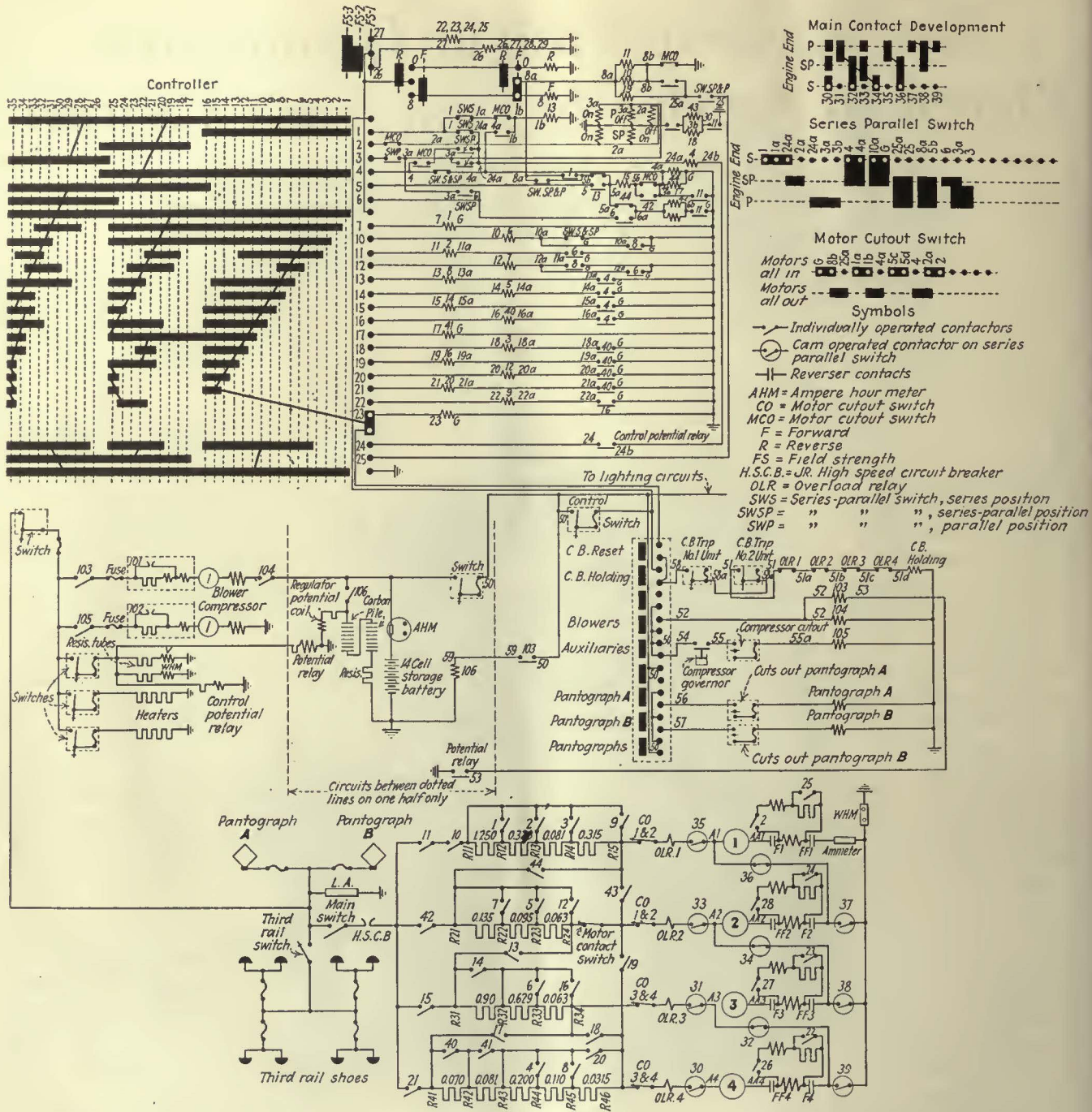
frame is a single steel casting, as shown in an accompanying illustration. This use of large steel castings for underframes and truck frames is the most notable mechanical feature of this locomotive and simplifies the construction by eliminating great numbers of bolts, nuts and small parts. Extending longitudinally through the middle of the underframe casting is a large duct for conveying air from the blower above, through the centerplates to the traction motors. Lugs for lifting the cab from the trucks, buffer beams with push pole pockets, convenient attachment for couplers, for truck safety chains, etc., and side steps are cast integral.

The truck frame is an integral steel casting and embraces side frames, end frames and

transom. The transom is cast hollow, to conduct the air which passes downward through the large centerplate opening to the motors. Lugs for spring nose suspension of the motors are cast on the transom. The cast frame is supported at the middle of each side on a semi-elliptic spring, the ends of which are carried in cast steel spring hangers, swung between two equalizer bars. The equalizer bars are cushion-supported on each journal box by a nest of helical springs, which adds very materially to the good riding of the locomotive. The journal boxes are made of cast steel with brackets projecting from the under side for the support of the third rail shoe beam. The wheels, which are all drivers, have cast steel spoke centers and steel tires. The journals are 7 in. x 14 in.

PRINCIPAL DIMENSIONS AND WEIGHTS OF NEW YORK CENTRAL LOCOMOTIVE

Length over coupler faces.....	68 ft. 2 in.
Length of each cab.....	29 ft. 0 in.
Truck centers.....	16 ft. 0 in.
Spread of third rail shoes.....	49 ft. 0 in.
Height of floor over rails.....	5 ft. 4½ in.
Height of roof over rails.....	12 ft. 7½ in.
Height of trolley retracted.....	14 ft. 7 in.
Width over cab sheets.....	9 ft. 10 in.
Width over all (over eaves).....	9 ft. 11½ in.
Wheelbase, total (both units).....	55 ft. 3 in.
Wheelbase, each unit.....	24 ft. 3 in.
Wheelbase, truck.....	8 ft. 3 in.
Weight, total.....	353,600 lb.
Weight, per axle.....	44,200 lb.



Controller Development and Wiring Diagram of New York Central Road Freight Locomotive, Two of Which Have Just Been Received

Eight traction motors of standard geared railway type, with commutating poles and forced ventilation, are mounted on the axles. The motors are designated as GE-286A and are identical, except for gear ratio, with those used on the Class Q switching electric locomotives. The same type will also be used on the oil-electric locomotives now under construction. The pinion on the armature shaft has twenty teeth and the spring gear on the axle 69 teeth, giving a ratio of 3.45, as compared with 4.235 on the Q locomotive. The motors are insulated for 1,500 volts for possible future use, two in series.

The four motors on each unit are connected in series, series-parallel and parallel, at successive controller handles on

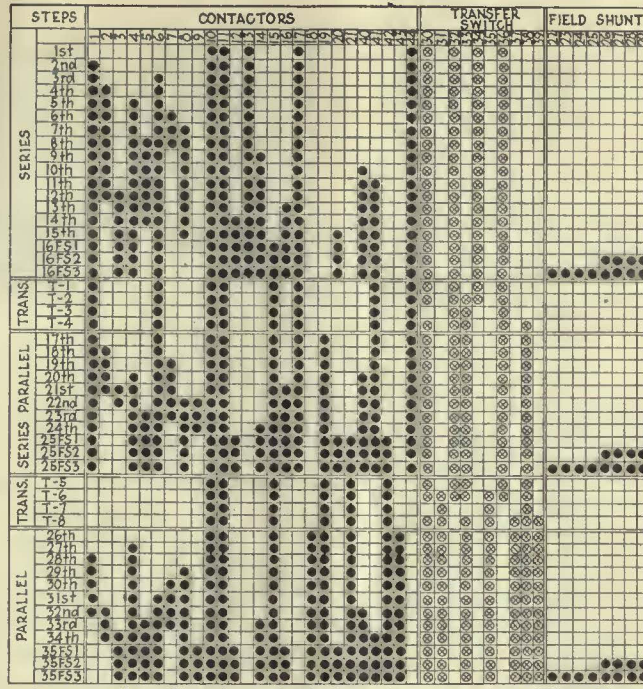
the controller can be moved to either of two positions, known as FS-2 and FS-3, to obtain higher speed by weakening the motor fields by means of inductive shunts.

The GE-286 motor is rated at 415 hp., 575 amp., on the standard one-hour basis, with a temperature rise of 120 deg. C. and a voltage of 600. The continuous rating is 332 hp. at 460 amp. The one-hour rating of the locomotive is 3,320 hp. At 20 per cent adhesion between wheels and rails, based on 170 tons weight, the locomotive develops 68,000 lb. tractive effort. The speeds to which this tractive effort can be exerted at 575 volts are: Series, full field, 4.0 m.p.h.; series parallel, full field, 9.6 m.p.h.; parallel, full field, 20.0 m.p.h.; FS-2, 22.5 m.p.h.; FS-3, 24.8 m.p.h.

Each motor was given a rigid shop test. The resist-

ances of fields and armature were measured. Two motors were coupled mechanically and run for two fifteen-minute periods in each direction, each machine running alternately as motor on rated current and as generator discharging into a water rheostat. Each motor was given a high potential test of 4,000 volts. Sample motors were also run at various loads and voltages to check the characteristics. Commutation was practically sparkless at all loads. Heat runs were made under various conditions, blown and unblown, full and shunted field and voltages running from 300 to 750 volts to check the ratings. The characteristic curves of the motors and the tractive effort curves of the locomotive are shown herewith.

The cab of each unit is divided by a transverse partition into an operating cab at the outer end and an apparatus space occupying the remainder of the cab. An aisle extends along each side from a door in the partition to a middle door at the other end for communication between units. The blower for the traction



When operating with motors cut out, line contactors come in on 17th notch

Sequence Diagram Showing Operation of Control and Contactors for New York Central New Road Freight Electric Engine

motors, the air compressor, hand brake, air brake apparatus, etc., are located on the floor between these aisles. The control apparatus, including contactors, circuit breaker, relays, reverser, series-parallel switch, fuse boxes for auxiliaries, etc., is arranged in two rows in a compartment next to the operating cab and is accessible both from the outer aisles and from a short center aisle opening into the operating cab. The grid rheostats are located just above the floor, below the control apparatus, in this compartment and are ventilated through flues to the roof. The estimated height of the center of gravity is 59 in. above the top of the running rails.

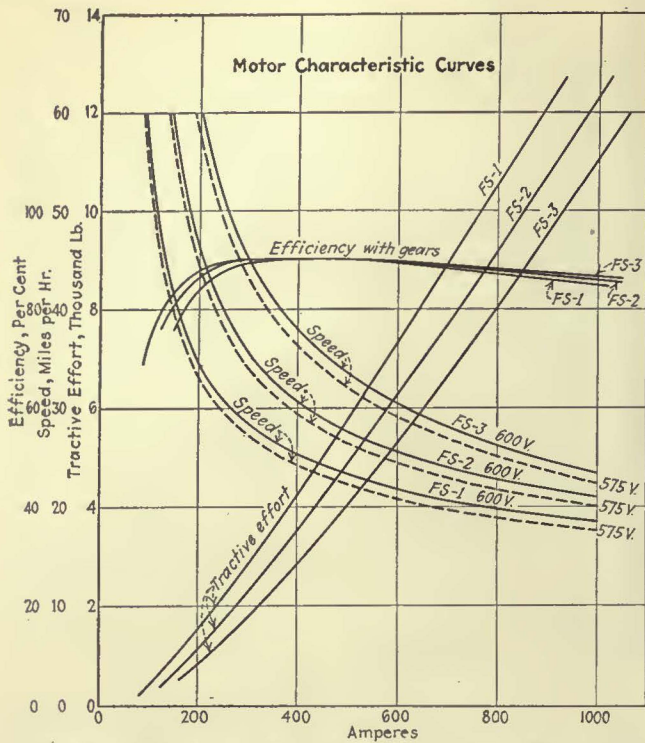
Both units are wired alike except for the battery and

battery accessories, as illustrated in the schematic diagrams reproduced herewith.

The control apparatus is of the PCL electro-pneumatic type. The contactors, reversers and series-parallel switches are operated by air cylinders. The air for operating each cylinder is controlled by a magnet valve



One of the innovations in this electric locomotive is the cast-steel floor frame type of construction. This eliminates an expensive assembly job using structural shapes and rivets



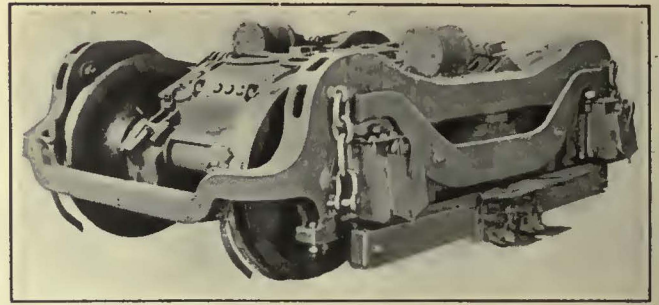
Characteristic Curves of the General Electric 286 Motors Rated at 415 Hp. on 575 Volts. Eight Motors on Each Complete Locomotive Are Used, Making the One-Hour Rating of the Engine 3,320 Hp.

energized from the master controller. The series-parallel switch consists of a group of ten contactors operated by a camshaft controlled by four magnet valves. A 32-volt, 150-amp.-hr. storage battery, charged in series with the blowers, is used to furnish current for the motor control circuits, lights and control of all auxiliaries.

All auxiliaries, including pantographs, blowers, compressors and lights, are controlled by push button switches located convenient to each engineer's position.

A blower to provide forced ventilation for the traction motors is located on each unit. Also on each unit is a two-stage air compressor, having a displacement of 150 cu.ft. of free air per minute that supplies air for the air brake system, motor control and auxiliaries, including pantographs, whistles, sanders, etc.

Each locomotive is equipped with eight third-rail shoes on each side for operation on the standard New York Central third-rail. In addition four pantographs are provided which will collect current from either the over-

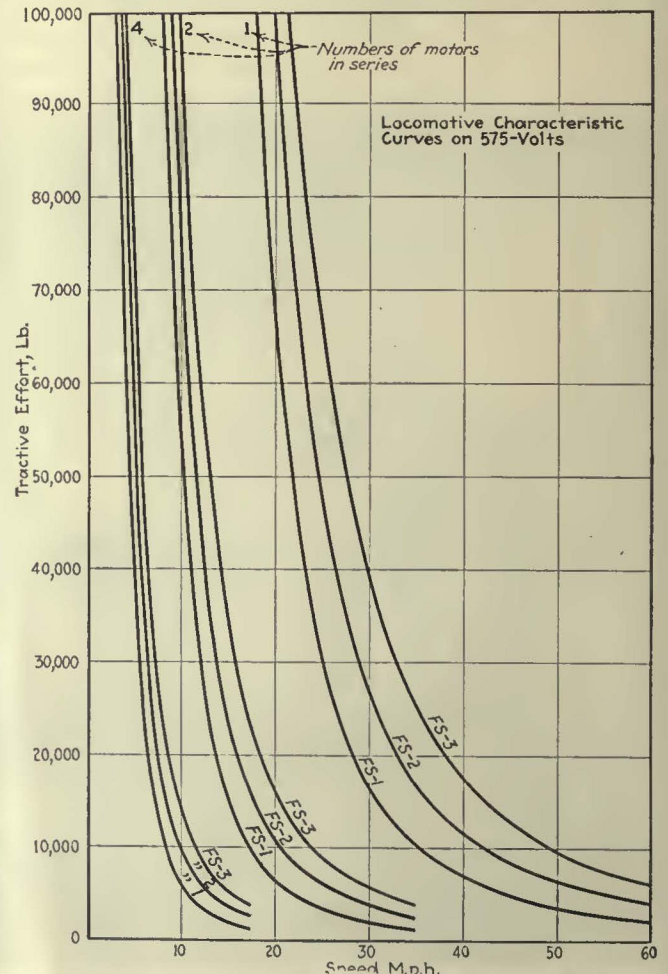


Cast-Steel Truck Frames Are Used with Two 415-Hp. Motors Mounted on Each. Two Trucks Non-Articulated Comprise a Half Unit of the Locomotive and Two Units and Four Trucks the Complete Assembly

head third rail at a height of 15 ft. 3 in. or on the contemplated overhead construction on the west side tracks at a height of 17 ft. 4 in. A bus line between units was not considered necessary.

The locomotive is protected from lightning by an aluminum cell lightning arrester. The motor circuits are protected by a high-speed circuit breaker which opens on excessive current and can be tripped by an overload relay in each motor circuit or by a switch placed convenient to the engineman.

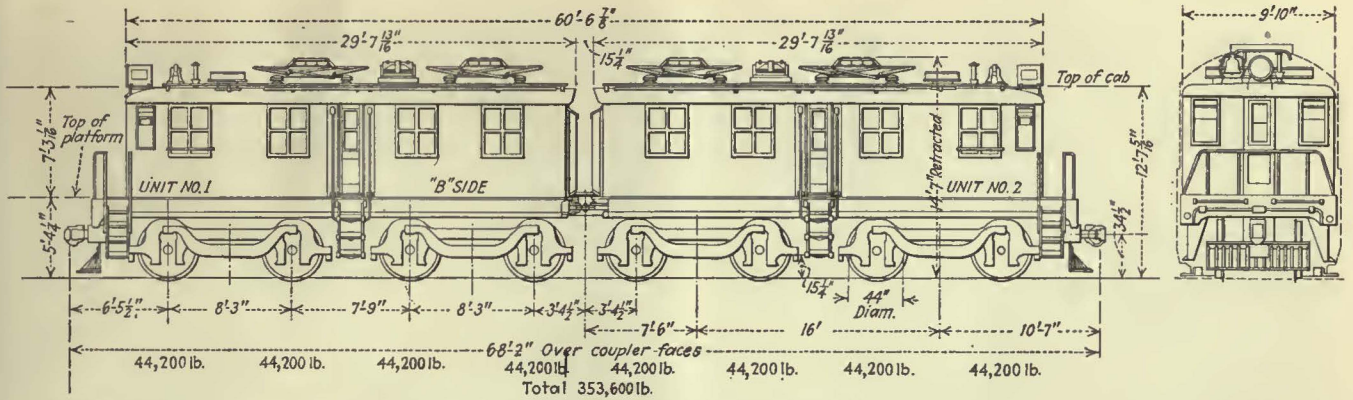
The locomotive is capable of operating with a train on a curve of 230-ft. radius and of running at a speed of 60 m.p.h. Under test with special gears this unit has been run at 86 m.p.h. The locomotive is designed to haul a train of 3,000 tons weight, consisting of 75 per



Tractive Effort Curves of New York Central New Road Freight Engines. Nine Running Points Are Provided by Use of Motor Connections and Field Shunts. Under Test One Engine Has Made Speeds of 86 M.p.H. with Special Gears



Cast-Steel Truck Frames Ready for Assembly. New York Central Has Just Received Two Road Freight Locomotives Equipped with These Trucks



All Weight Is on Drivers and Evenly Distributed, as Shown in This Drawing of the First of Two New Electric Road Freight Locomotives Recently Received by the New York Central

cent empties and 25 per cent 50-ton loaded cars, at a speed of 32 m.p.h. and with 575 volts at the motors.

The service capacity of the locomotive was defined in the specifications by a requirement that in a continuous series of runs between 79th Street (west side) and Harmon, hauling the train just mentioned, making four intermediate stops of two minutes duration on each trip, accelerating at 20 per cent adhesion and having a lay-over of twenty minutes at each terminal, with voltage at 575, the temperature rise in the motors should not exceed 140 deg. C. measured by change in resistance or 120 deg. C. by thermometer.

ACCEPTANCE TESTS WELL WITHIN SPECIFICATIONS

An acceptance test of one of these locomotives was run recently to ascertain whether the locomotive conformed to the requirements of the specification. A train of 108 cars, including cabooses, with the proper proportion of loads and empties, weighing 3,006 tons, was assembled. A caboose containing instruments to indicate and record voltage, amperes and speed was coupled to the locomotive and the instruments connected into the locomotive circuits by cables carried temporarily over the roofs. It was intended to run three round trips with this train in about 7½ hours, but due to accidental uncoupling of cars and other operating delays the test was terminated after nine hours, near the end of the second round trip, after making 95 train-miles. The number of stops, exclusive of terminals, was seventeen. The maximum speed was 34½ m.p.h. The amount of energy consumed by this locomotive in hauling the 108-car train under the described test conditions was 26.3 watt-hours per trailing ton-mile.

The maximum motor temperature rise observed was

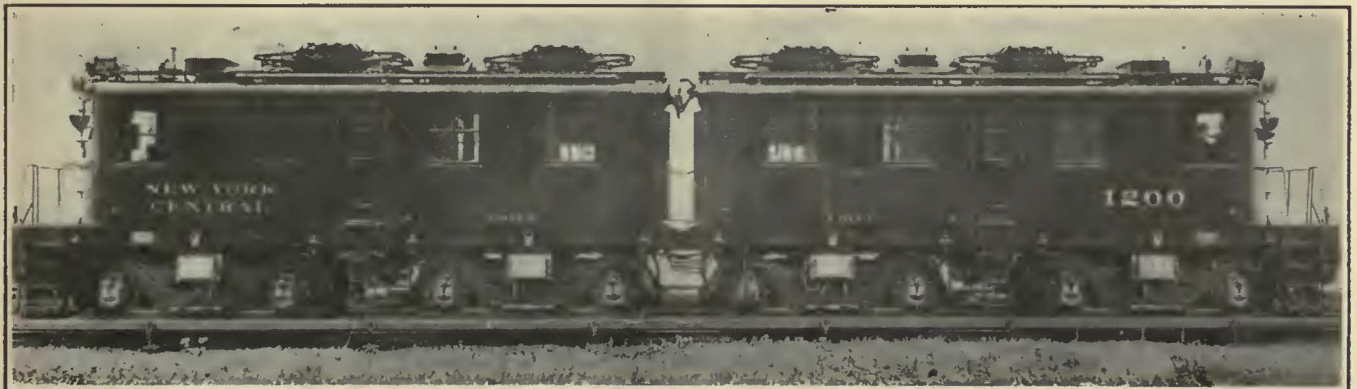
90 deg. C., which, taking into consideration all the conditions of the test, indicates that the temperature rise would be well within the limit of the 140-deg. requirement in the specification.

Changes in Passenger Traffic in London Since 1913

COMPARISON of the numbers of passengers carried by the rapid transit lines, buses and tramways of Greater London in 1913 and 1925 discloses an interesting change in the relative importance of these three modes of transport. The volume of traffic carried by each of the three has greatly increased during the interval of twelve years, but the growth has been uneven and the buses and rapid transit lines have overtaken the tramways, which in 1913 occupied the first place.

	Passengers Carried	Per Cent of Total	Rides per Caput
Tramways, 1913.....	812,000,000	36	110
Tramways, 1925.....	979,000,000	27	128
Buses, 1913.....	736,000,000	32	100
Buses, 1925.....	1,671,000,000	45	218
Rapid transit lines, 1913.....	725,000,000	32	98
Rapid transit lines, 1925.....	1,049,000,000	28	137

From 1913 to 1925 the total volume of traffic increased by 63 per cent, but the tramway passengers increased only 21 per cent. The bus passengers increased by the phenomenal figure of 127 per cent, while the rapid transit passengers increased by 45 per cent. The result has been that the tramways have fallen to the bottom of the table while the buses have risen to the top. Meantime the rapid transit lines advanced to the second place.



Side View of the New Electric Engine That Will Haul 3,000 Tons of Freight Consisting of 100 Cars Between Harmon and New York City

Educational Opportunities for Philadelphia Employees

MANAGEMENT representatives of the Philadelphia Rapid Transit Company, Philadelphia, Pa., will devote much time this fall and winter to educational courses designed to give to P.R.T. employees opportunity for a broader understanding of the principles underlying the co-ordinated transportation system and its varied activities. The courses are under the direction of men who are not only versed in the theories of their subjects but in their practical application as well.

Courses 1 and 2 at the William Penn High School are open to all. Courses 3, 4 and 5, applying more specifically to P.R.T., are held entirely under P.R.T. auspices at company locations.

1. *Public Relations with a Background or Transportation and Public Utility Economics*—J. M. Shaw. Held at William Penn Evening High School, Fifteenth and Wallace Streets, 7:30 to 9:30 p.m., Tuesday evenings, from Sept. 14 to Dec. 14, inclusive. Topics will include:

1. Origin and development of co-ordinated transportation as a public service.
2. Owner, manager, worker, consumer — four wheels whose alignment is necessary to progress.
3. Monopoly vs. competition.
4. Relation of fares to service.
5. Production and participation—the heart of the industry.
6. The new science of public relations.
7. Developing public contacts.
8. Service as a mold of public opinion.
9. Public ownership of public utility securities.
10. The technique of complaint adjustment.
11. The newspaper.
12. Some advertising mediums for a co-ordinated transportation system.
13. General review.

2. *Handling Men*—E. J. Benge. Held at William Penn Evening High School, Fifteenth and Wallace Streets, 7:30 to 9:30 p.m., Monday evenings, from Sept. 13 to Dec. 13, inclusive. Topics will include:

1. The problem of handling men.
2. Stimulating subordinates.
3. Control.
4. Discipline.
5. Appeals for better work.
6. Rivalry and other incentives.
7. The force of habit.
8. Training insures careful work.
9. The supervisor's job.
10. Difficulties with subordinates.
11. Combating negative traits.
12. Difficulty with superiors.
13. Responsibility and authority.

3. *Electric Railway Industry*—Held at Luzerne Auditorium, 7:30 to 9:30 p.m., Thursday evenings, from Oct. 7 to Jan. 6, inclusive.

1. Development of street railway industry, W. K. Myers.
2. Public relations, J. M. Shaw.
3. Importance of employees in public utilities, A. A. Mitten.
4. Transportation and traffic, W. J. Beadle.
5. Generation and distribution of power, H. G. Werner.
6. Maintenance of equipment, G. H. Stier.
7. Construction and maintenance of way, J. H. M. Andrews.
8. Materials, W. E. Scott.
9. Finance and accounting, C. E. Ebert.
10. Legal, C. J. Joyce.
11. Claims, J. J. K. Caskie.
12. The motor bus, J. A. Queeney.
13. General discussion, J. E. Whiting.

4. *Supervisory Problems*—Messrs. Andrews and Beadle.—A discussion group open only to superintendents, foremen, supervisors, department heads and others in equivalent positions. Held at 1520 Spruce Street from 7:30 to 9:30 p.m. on alternate Wednesday evenings. Six meetings: Sept. 22, Oct. 6; 20, Nov. 3, 17, and Dec. 1.

5. *Public Speaking and Parliamentary Procedure*—Mr. Holt.—A practical group consisting of ten meetings at Luzerne Auditorium, 7:30 to 9:30 p.m., Monday evenings, from Sept. 20 to Nov. 22.

Express Station Converted Into a Garage

SEVERAL years ago the Union Street Railway, New Bedford, discontinued its electric express business when connecting trolley lines leading to two of the principal shipping points, Boston and Providence, were discontinued. The general increase of motor trucking also proved to be too great a competitor. A centrally located modern freight station, representing a large investment, then yielded no income.

With the establishment of the motor coach service by the railway a garage where the coaches could be suitably housed and repaired had to be provided. As this express station was located less than $\frac{1}{4}$ mile from the



Union Street Railway Now Uses This Former Freight Station to House Twelve Buses

New Bedford terminal of the New Bedford-Fall River-Providence motor coach line, it was considered an excellent location for a garage. Little remodeling of the building was necessary. As about two-thirds of this building had been previously leased to a local distributing agency, only the remaining third was converted into a garage. Should the company deem it advisable to increase motor coach operation at any time the remaining part of the building can be remodeled as a garage extension.

Reconstruction consisted mainly of installing garage doors, laying a concrete floor with safety bumpers, providing a washing and draining system and piping and wiring for heat and light. Air pumps, machines and benches were also systematically installed. The office at the end of the building was converted into a combination office and stock room.

Railway Information Published in Cincinnati Telephone Directory

IN CINCINNATI, OHIO, a city and suburban telephone directory is no longer complete without information on the street railway companies. The summer, 1926, classified directory, with valuable information of the railway and bus routes of the Cincinnati Street Railway is proof of this innovation. A full page map shows the co-ordinated service as of April 1 and a second page contains data on car lines, route numbers, fares and transfers, as well as diagrams of boarding and alighting points. For the resident of the city of Cincinnati this directory will be helpful, but for the strangers in the city it will serve as an invaluable guide.



This View Shows an Articulated Car, a Single Car, a Single-Deck Bus, a Double-Deck Bus with Open Top and a Double-Deck Bus with Closed Top, All About to Make the Crossing at Sun Square, One of the Oldest and Busiest Cross Roads of Baltimore

Baltimore in Campaign to Increase Traffic

Many Notable Improvements, Including the Addition of Modern Rolling Stock and Methods for Making Higher Schedule Speed, Have Won Increased Patronage—The Company Has Also Actively Participated in Civic Movements to Improve Street Conditions

LOCAL public carrier transportation is sometimes called a monopoly, but the United Railways & Electric Company of Baltimore realizes that the modern story of a street railway is a story of competition. It believes that only by popularizing the service and making the public realize the necessity for favorable operating conditions can an electric railway do its full share in local transportation.

During 1924 and the early part of 1925 the company suffered a decrease in revenue passengers carried, as compared with the previous year, and while changes in zones made this decrease appear greater than it really was, predictions were not wanting from persons hostile to the company that street cars were becoming obsolete and that Baltimore's mass transportation would be handled before long entirely by buses.

Today the situation is quite different. Since January, 1926, both gross revenue and revenue passengers have not only exceeded the figures for 1925 but those for 1924, before the changes in zones already mentioned

were made. March, April and May were the most profitable months the company had had since 1920, the peak year in the street railway industry in the country. For the six months ended June 30, 1926, revenues increased 2.5 per cent over a corresponding period for 1925 and revenue passengers increased 3.6 per cent. What is equally, if not more, important, suggestions in the daily newspapers that street cars are out of date have disappeared, and the public attitude toward the company has greatly changed. The most important factors, in the opinion of the company, for this change are:

1. Open and vigorous advocacy by the company of the interests of the car riders of Baltimore in all traffic discussions.

2. Proof by the company of its sincerity in this advocacy by actual diligent attention to the car rider's comfort and convenience when on the cars or buses; in short, painstaking service.

3. Getting rid of old-fashioned cars and substituting bigger and better ones, substantially increasing bus

operations, practical and successful work on the rush hour problem; in brief, "new service for old."

4. Frankly selling this service in the open market against competition by newspaper advertising on a large scale.

5. A definite policy of self-criticism and consistent co-operation with public criticism for the good of the service.

6. Constant reiteration to the public of the principle that the good street car system, properly augmented by

interests if they adopted the majority report, since most of the shoppers shopped by street cars, and speedier street car service was more necessary than the right to park automobiles indiscriminately.

To prove this contention, the company arranged to make a check of the customers arriving at three prominent downtown stores—one of the largest department stores in the city and two smaller stores. This check showed clearly that for three days less than 5 per cent of the customers of the big department store came by



Some of the Streets in Baltimore Are Equipped with Raised Platforms. The Entering End of the Platform Is Protected with a Safety-Zone Light Post, with Conspicuously Marked Base, and the Leaving End with a Substantial Frame Containing a Safety Poster. This View Is on North Charles Street

buses, cannot be improved upon for public transportation; earnest efforts to prove this by service, and publication of the proof whenever possible.

7. More than ordinary eagerness to co-operate with the Baltimore people and groups—to be a part of the life of the city—to put the whole car system on the side of sound movements involving the general public welfare.

Some steps in this campaign, such as the advertising campaign, which was distinguished by a series of very striking full-page advertisements in the Baltimore local papers, have been described in the *ELECTRIC RAILWAY JOURNAL*, as in the issue of March 27, 1926, page 551. This article touches briefly on other steps in the program, as mentioned in the company's brief in the Coffin award contest.

SUPPORTING THE INTERESTS OF THE CAR RIDERS AND PUBLIC POSITION OF THE RAILWAY

This is the first factor mentioned in the list and is perhaps best illustrated by action taken on the conclusions given by Kelker, De Leuw & Company in a traffic survey report for Baltimore made by them during the early part of 1926. One of the recommendations in this survey was the elimination of parking, both partial and complete, in congested districts. This conclusion was attacked by the traffic committee of the Baltimore Association of Commerce, which was composed of business men and industrial interests and included a representative of the railway. The majority report of the committee opposed prohibition of parking on the ground that customers of the local stores used automobiles in their shopping trips rather than the railway. The representative of the railway presented a minority report, pointing out that the merchants would oppose their own

automobile, and on one day the percentage was only a little more than 3 per cent. The result of this survey and other data which the company was able to offer was that the board of directors of the Association of Commerce voted unanimously to reject the report of its own traffic committee and to support the recommendations of the traffic survey as far as possible.

INCREASED EFFICIENCY IN OPERATION

This is the factor mentioned second in the list given. It is obvious that the company's success in gaining public good will in Baltimore would not have been possible without, first, proof of its sincerity in advocacy of the car riders' rights by substantial improvement of its service and, second, frank and vigorous efforts to sell this service in the open market against competition. Proof of improvement in the service is shown by the fact that since September, 1925, a total of 95 more or less obsolete cars have been dropped from the company's equipment, and as a result of an intensive car construction program, coupled with a scientific study of each of the company's 36 lines, there have been:

1. Substitution on one important line of cars seating 47 passengers for cars seating 36 passengers.
2. Substitution of 36-seated cars for 30-seated cars on two important lines.
3. Doubling of the number of 60-passenger trail cars on one important line.
4. Adoption of a system of interline operation during rush hours which the company believes to be unique, resulting in ability to make double use of many cars when most needed, less crowding of riders during peak periods, greater frequency of service, decreases in dead-head or "light" mileage and increases in receipts per car-mile.

5. Increases in speed on many lines.

6. Adoption of express service on suburban lines, materially reducing the difficulties presented by requirements for long and short haul service on the same line.

7. Completion of 26 articulated two-car, three-truck trains, a boon during peak hours, since they double the capacity of the lines on which they operate, and are a popular improvement with riders.

8. Greater use and increase in the number of permanently coupled two-car trains, which have proved invaluable, especially for heavy movements to and from places and events that attract crowds.

Of the 95 cars dropped as obsolete, 87 were single-truck closed cars, seating 30 passengers each; one was a single-truck convertible car, seating 28 passengers, and seven were single-truck one-man cars, seating 22 passengers each. In all cases the substitution of bigger cars for smaller ones meant semi-convertible cars with cross seats in place of double-truck closed cars with longitudinal seats. One line on which this was done runs through a territory largely occupied by automobile owners, and the old cars did not attract them, while the new ones did. In the first five months of 1926 this line showed an increase in earnings of 7 per cent over the corresponding period in 1925.

HOW GREATER SPEED HAS BEEN OBTAINED

The adoption of the recommendations in the traffic survey will help to increase the speed of both street cars and automobiles in Baltimore. In the meantime the company has introduced several other changes which help in this direction.

Its service includes that by both single cars and two-car trains, but it was found that during the rush hours the two-car trains, whether made up of motor

The adoption of the plan only during rush hours seemed to avoid many of the objections to the old-fashioned plan of "skip-stop." In fact, so successful was the change that beginning June 1, 1926, the company has used its "limited stop" plan on three other lines, whose operation was not complicated with the mixture of two-car trains and single cars. In these cases, stops are skipped during rush hours only. Stop poles in Baltimore carry a white circle, as is usual, to identify them, and under the new plan the poles not used during rush hours have a distinctive marking to distinguish them from those where stops are made at all hours.

SEQUEL TO THE TRAFFIC SURVEY

It might be appropriate here to mention briefly the sequel of the extended traffic survey, completed last March and published in abstract in the *ELECTRIC RAILWAY JOURNAL* for May 22 and May 29, 1926. The opposition against the parking recommendation in this survey, brought by the traffic committee of the Baltimore Association of Commerce, has already been mentioned, but, as explained, this opposition later was withdrawn. Other opposition developed to certain of the rerouting recommendations, and the recommendations as a whole are now being considered by the Public Service Commission. The company is helping to assist in the adoption of the improvements recommended in the survey by stressing its willingness to bear the initial cost of changes in its track required, by the supply of pertinent data and in other ways.

CAR FARE CARRIERS IMPROVE SPEED

A small but effective step which has resulted in improving an increasing car speed is the issue of a small metal container to hold the tokens used for fare in



Neat Waiting Stations Have Been Erected for Passengers on Suburban Lines

car and trailer or multiple-unit cars, were slower than the single cars because of the larger number of stops made to receive and discharge passengers. In consequence, a skip-stop plan for these trains was put in effect during rush hours so that the two-car trains were at once put on an equal footing, as regards schedule speed, with the single cars. Decreases in running time resulted, the amount saved on one line between the center of the city and the line's northeastern terminus, a distance of approximately 6 miles, being six minutes.

Baltimore. These containers have a capacity of fourteen tokens each and are sold with thirteen tokens for \$1. They cost the company 4 cents each, and since the token fare is 7½ cents, their price to the public under this plan is 2½ cents. The carriers are well advertised and their help in speeding up the boarding of passengers is considerable. It is expected that this effect will be even more marked as the distribution of carriers increases.

The number of banks, business houses and stores at

which tokens are sold has been increased. There has also been an increase in the number of uniformed men stationed at busy loading corners, theaters, baseball parks and railroad depots, who offer car checks for sale to riders before they board the cars.

CHANGES IN TRANSFER METHODS

Two other methods for increasing the speed of cars adopted during the past year are the elimination of the rule that junction points must be punched on transfers during rush hours and allowing transfer passengers to board their cars at either front or rear doors. When presented at the front doors motormen accept the transfers. Since conductors have ceased to punch junction points on transfers issued during rush hours and have been relieved of much transfer collection, they have been able to shorten the length of passenger stop.

Another gain in speed has been secured by establishing express service on some of the long suburban lines, namely, cars which do not stop on the outbound trip until a certain point has been reached except to receive passengers or inbound beyond a certain point except to discharge passengers. Still another type of "express" service inaugurated last year is known as the "two-fares-as-you-enter" plan on a line that carries many riders well into the second fare zone in the country. On these cars all riders pay both the city fare and the first country fare on entering. This automatically excludes all city riders and leaves these cars to the homegoing suburbanites.

ARTICULATED CARS FOR RUSH-HOUR SERVICE

One of the most popular improvements in the equipment adopted by the company recently is the articulated car—a two-car, three-truck train, motorized throughout. Fourteen cars of this type were constructed during the past year, making a total of 26 now in service, and six more were being built at the company's shop and were to be ready for service in September. Each articulated car seats 87 persons and an account of it, as well as of the multiple-unit train of the company, appeared in the *ELECTRIC RAILWAY JOURNAL* for April 11, 1925.

The articulated car is operated as a single "pay-as-you-pass" unit, the conductor standing at the front end of the rear half of the unit where he controls all exit doors.

These cars are operated during rush hours on two very heavy traffic lines, and as the schedules on these lines at the extreme peak call for a 3 to 1 ratio or more, there is no waste of cars. The practice followed is for the base crews on certain single cars used during the day to change to the articulated cars as they pass the operating carhouse. This essentially doubles the capacity of the line with no increase in platform men. The single cars turned in by the base crews are then used by the tripper crews, tripling the capacity of the line.

Steam and Electrics Co-operate in Indiana

FREIGHT shipments, both carload and less than carload, are being handled by the Union Traction Company of Indiana between all points on its line and all points on steam railroads south of Louisville, Ky., and the Ohio River, according to F. D. Norviel, general passenger and freight agent for the company. He stated that this means that shipments might be routed by electric railway and reach their destination in from one to four days less time than by an all-steam routing.

An example of the fast transit afforded by the inter-urban line occurred recently when a shipment from Indianapolis was only four days in transit to Atlanta, Ga. According to Mr. Norviel, the electric railway handling to Louisville greatly expedites freight movements between Indiana and the Southern states.

Bus Legislation in Victoria, Australia, Proves Effective

JUST as almost everywhere throughout the world, the arrival of the motor bus in Australia was followed by a weed-like growth and attempts to encroach upon established rail services in preference to developing new areas. In the case of the Melbourne & Metropolitan Tramways Board, the management had been forewarned by its close knowledge of bus and jitney operations in Great Britain and America. Hence less than two years elapsed before effective legislation was secured.

In December, 1923, during the fiscal year ended June 30, 1924, when the board reported losses from wildcat buses, it also secured the right to operate motor buses for "aiding or relieving" traffic on the tramways, in addition to the original right of operating motor buses for "stimulating or developing the traffic of any tramways." This change gave the board the opportunity to discourage wildcat operators and also to start services other than those of the thankless pioneering kind.

At that time the maximum license fee for a bus was about £10; buses paid no road maintenance charges; buses could run over tramway-maintained paving if they chose; nor were they subject to the wage and working conditions imposed on the board as a tramway operator.

These inequalities have been wiped out to a degree by Act 3378 of Dec. 30, 1924, and Act 3439 of Dec. 31, 1925. Buses are now required to pay an average fee of £3 10s. (approximately \$17) per seat per annum, yielding about £115 (approximately \$558) from a 33-seater. This money goes into the "Metropolitan Roads Fund" for the "Metropolitan Area," which means the city of Melbourne and the vicinity within 8 miles from the corporate limits.

Buses may ply only on routes which are approved by the Minister of Public Works. Such routes are not granted where he considers that adequate tramway or railway facilities exist, or where the roads cannot withstand motor bus traffic. Before deciding upon an application the route is reported upon by an advisory committee of five members, representing the railways, the tramways, the municipalities, the provincial government and the bus proprietors.

The board now operates 56 buses, including those which are used while cable routes are being electrified. Such temporary operation in a wildcat bus territory was inaugurated on Jan. 3, 1925, from the first fleet of 45 buses. These buses pay the prescribed taxation just like those owned by private operators.

By July, 1926, there were only 80 privately owned buses. These compete with the tramways and railways to a very small extent. As the cost of maintaining these buses is increasing, no new ones are being put on the roads. With the present high cost of bus operation and maintenance and the rather strict regulations now in force, it seems certain that in the future the use of the bus in Victoria will be confined to routes and service for which it is especially adapted.



Latest Type Open Car of the Honolulu Rapid Transit Company with Center Aisle Has a Seating Capacity of 56

Railway Prospects Bright in Honolulu

Earnings Are Good and the Operating Ratio Is Low in the Metropolis of the Mid-Pacific—Buses Are Used as Feeders to the Rail Lines—System Dates Back to Grant from the Kingdom of Hawaii

By *A. E. Kirk*

Assistant Manager Honolulu Rapid Transit Company

IN HONOLULU all classes of the population are street car riders. It is not unusual to see a car carrying Americans, Hawaiians, Japanese, Chinese, Portuguese, Filipinos, Koreans and negroes. No racial distinctions are made, and the various nationalities travel together without friction. Transportation service in this thriving city of 105,000 people is rendered by the Honolulu Rapid Transit Company, which operates some 35 miles of electric railway track and 6.5 miles of bus line. In almost every year since its organization the company has been able to pay its stockholders an 8 per cent dividend.

In 1894 the Hawaiian Tramways Company began operation of a horse car system under a franchise granted by the Kingdom of Hawaii. The horse cars were operated on headways of 20 and 30 minutes, which at that time were deemed sufficient. No effort was made to increase the service as the city grew, and in a short time people began to demand some faster and better means of transportation. In 1898 the Legislature granted a franchise to the Honolulu Rapid Transit & Land Company, which began operation of electric cars on Aug. 31, 1901. As the horse car company had rights for the use of all the more important streets, the Rapid Transit Company in 1903 bought out the franchises, property and other interests of the Hawaiian Tramways for \$300,000.

Ever since the purchase the company has endeavored to keep pace with the growing community. In 1923 a large improvement program was undertaken. The lines to Waikiki Beach, Kaimuki, Fort Shafter and on Liliha Street were double tracked, using 122-lb. grooved girder rail. This has made it possible to give better service on these lines and has enabled the company to handle large crowds very expeditiously.

Four years ago the company's name was changed to the Honolulu Rapid Transit Company. A new franchise placed it under jurisdiction of the Public Utilities Commission of Hawaii. Appeals from the decisions of the commission, however, may be taken to the territorial courts. The property was valued at \$3,219,000 and capitalized at \$2,500,000, all common stock, every share of which is owned in the territory. A return of 8 per cent is allowed by the commission, and until 1924 this was paid regularly. In that year 3 per cent was paid, and in 1925 the dividend was 7 per cent. The Legislature of 1925 abolished the former 2½ per cent tax on gross revenue for a period of four years, with the proviso that an increase in the dividend rate will automatically restore the tax.

Prior to October, 1924, the fare was 5 cents cash and 2½ cents for school children. After the valuation referred to in the preceding paragraph the rate was increased to 7 cents cash, 6¼ cents token, and 3½ cents for



Connecting Point of the Kalihi Bus Line and the Fort Shafter Street Car Line

school children. The average fare is now 6.09 cents per revenue passenger. Earnings of the system are 42.28 cents per car-mile, and expenses are 27.72 cents, making the operating ratio 65.55 per cent.

Railway equipment of the Honolulu Rapid Transit Company consists of 71 cars, of which six are semi-closed pay-as-you-enter type, and the remainder are open cars with center aisles, having an average seating capacity of 56. One-man operation is already in effect on one line, and it is expected that this will soon be extended to about half of the system. Bids have been asked for on twelve one-man two-man cars.

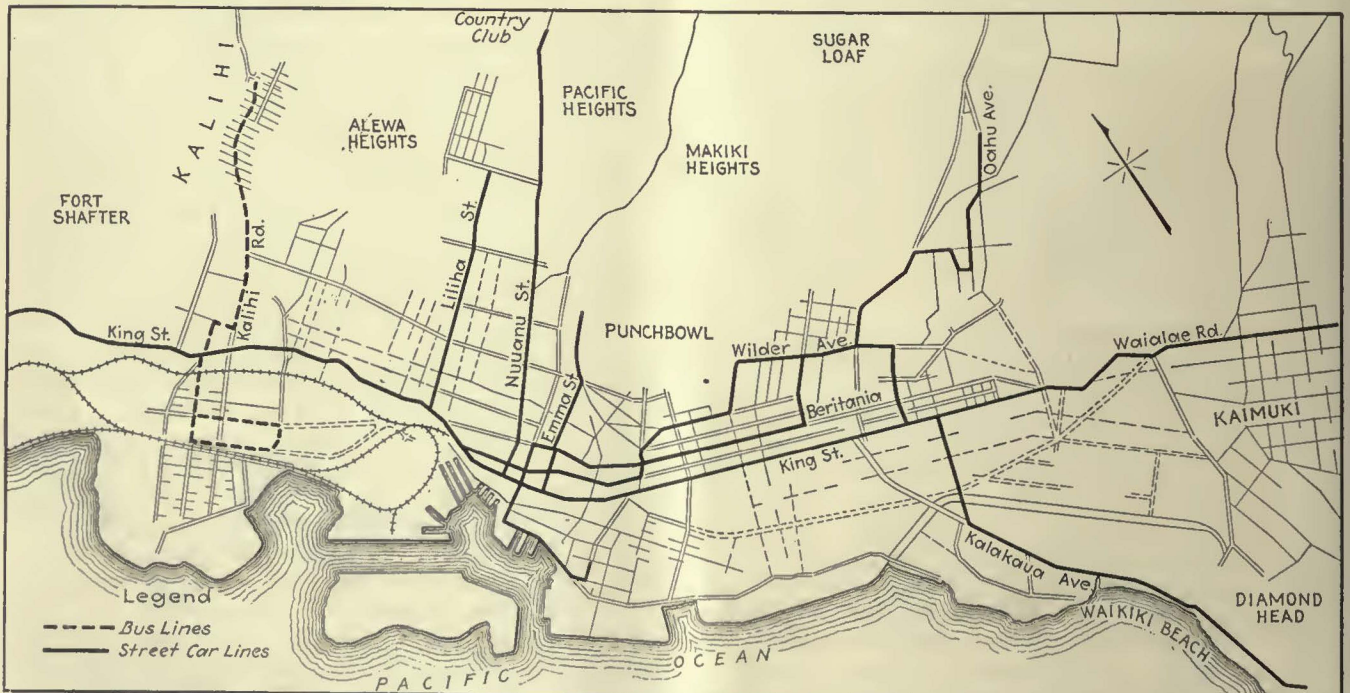
For six months in 1915 the company attempted bus operation, but was forced to give it up because of the poor condition of the roads. Packard buses were used at that time. In 1923 bus operation was resumed with Federal buses. Later, a Reo bus was added.

Bus operation was undertaken primarily to give

service to outlying districts not reached by the car lines. In 1925 this feeder service netted a profit of \$88. The company has carefully considered the bus question and does not contemplate the substitution of buses in place of cars. Future extensions, however, will probably be made with buses, and the feasibility of sight-seeing tours is being studied.

Serious operating difficulties are met in some places, as the streets are so narrow that an automobile cannot pass between a parked vehicle and a street car where there is double track. The average schedule speed of cars is 10 m.p.h. and that of the buses 12 m.p.h. The bus operation, however, is outside of the congested district.

Automobiles, of which there are 17,000 in the city of Honolulu alone, have made considerable inroads in the revenue. The number of passengers carried in 1925 was 17,607,737, a decrease of 2,200,000 from the num-



Transportation Needs of Honolulu Are Well Served by 35 Miles of Electric Railway Track and 6.5 Miles of Bus Route

ber carried in 1924. The first half of 1926 showed a further decrease. Traffic checks show an average of 1.98 passengers per automobile during rush hours, while the street cars average about 70 passengers. The management believes that the low ebb of traffic has been reached and that an increase may be expected in the near future.

Energetic methods are used by the company to encourage riding. Attractive advertising folders have been prepared and placed on all steamers touching at Honolulu as well as in the tourist hotels. The pamphlets point out the advantages of the street car in reaching various points of interest. When the United States fleet was in port in 1925, more than 20,000 folders were distributed to the sailors. Concessions are made for the convenience of tourists. For example, on days when Canadian Pacific steamships are in port, the company accepts Canadian money at par.

In spite of the large number of automobiles, and the fact that much of the equipment is of the open running board type, the Honolulu Rapid Transit Company has one of the lowest claims and damage ratios in the United States. The amount paid in 1925 was only 1.68 per cent of the gross income. This is the highest it has ever been and may be attributed to the increasing street congestion.

The company has enjoyed remarkable freedom from labor difficulties, in spite of the fact that the employees belong to a wide variety of races, including Americans, Hawaiians, Hawaiian-Chinese, Portuguese and Hawaiian-Japanese. All employees are covered by group life insurance to a maximum of \$2,000. Disputes are settled by an employees' council, composed of nine employees from all departments, elected yearly. The employees have a benefit association, to which the company regularly donates substantial sums.

Gratifying evidence of the sound condition of the property is found in a recent report by Richard Sachse and Bruce W. Campbell, consulting engineers, Los Angeles, who made an extensive survey of the system. Their investigations showed a relatively high operating efficiency and a sound and satisfactory financial condition.

Cincinnati Rebuilds Cars for One-Man Operation

AUTOMATIC treadle exits at both front and rear ends are features of a group of single-end cars recently rebuilt by the Cincinnati Street Railway for use on Route 43, operating between the Central Union Railroad Station and the hotel and business district. Full safety and interlocking devices have been installed. Other improvements include electric heaters, window wipers



Seats of the Rebuilt Car Have Been Upholstered in Washable Suede

and a new lighting system. The latter consists of twenty frosted lamps so wired that each is independent of the others. Seats are attractively upholstered in washable suede.

Outside the cars are finished in the new standard colors of this company—burning brush orange below the belt rail and locust cream above, applied by the Duco spray process. Bumpers are made of single pieces of pressed steel, and the rear bumper is painted with aluminum for the express purpose of giving increased visibility.



Single-End Car of Cincinnati Street Railway Equipped with Automatic Treadle Exits at Both Ends

Prominent Executives Commend the New Spirit of the Annual Convention Issue of the

THE Annual Convention Issue of *ELECTRIC RAILWAY JOURNAL*, dated Sept. 25, was entirely devoted to the subject of "Making Transportation Pay." Most of the articles in this issue were written by executives in charge of the operations on properties which have demonstrated by actual experience the effectiveness of modern equipment and modern methods in winning back patronage through improved service, while at the same time reducing operating costs.

That these operators, who contributed their valuable time to giving the industry the results of their experiences, have made a noteworthy contribution to the advancement of local transportation is evidenced by the many letters received from railway executives in this country and Canada. Space permits only the publication of extracts from these comments.

Harry Reid, president Interstate Public Service Company, writes as follows:

I have read the Annual Convention Issue of *ELECTRIC RAILWAY JOURNAL* with a great deal of interest and find it contains much advance and comparative news, showing much time and thought had been given to editing.

The articles are varied and interesting. The advertisements are not only attractive but full of up-to-date knowledge. I surely congratulate you upon this issue, and not only this issue but all issues.

From F. G. Buffe, vice-president Kansas City Public Service Company, came this letter:

Please accept my hearty congratulations on the excellent Convention Number of the *JOURNAL*.

Inasmuch as I was unable to attend the convention, it was doubly interesting to me. The advertising pages were exceptionally interesting, and I do not believe I ever saw a better prepared and more attractively designed and printed advertising section in any magazine.

T. H. Tutwiler, president the Memphis Street Railway, comments in part as follows:

It is a pleasure to me to acknowledge the valuable contribution and stimulus to the electric railway industry which your Convention Issue of Sept. 25 supplies.

In reading the several pages of editorial matter, as well as the various articles of the issue dwelling upon the value of proper equipment as agencies for promoting street railway traffic, my

impulse is quickened by the thought that we should strive the more zealously to make street car riding more attractive; and that, with lines and rolling stock thoroughly modernized, we should seek to merchandise our service through intelligent sales effort.

"Surely," as your opening editorial states, "the road opens ahead" for us; and we of the industry who are so vitally concerned with its success and progress have reason to feel encouraged that the gloomy clouds which have overshadowed our business during the past five years or so are breaking away, and the dawn of a brighter day seems to be at hand.

Your very worthy journal has been a distinct agency in bringing to the attention of executives throughout the industry the facts upon which more successful operation may be based, and the means by which policies looking to that end may be carried out. Every good wish for your continued success is heartily extended.

Arthur W. Brady, receiver Union Traction Company of Indiana, had this to say in part:

I have carefully examined the Convention number of the *JOURNAL*, just received. It is an unusually valuable one, dealing as fully as it does with what is being done throughout the country to make travel by electric railroad more inviting and at the same time to reduce costs and improve service. The industry is indebted to the *JOURNAL* for having so thoroughly covered the field.

C. D. Emmons, president the United Railways & Electric Company of Baltimore, says:

I wish to congratulate you on the Annual Convention Number of the *ELECTRIC RAILWAY JOURNAL*, which I have looked over from cover to cover and find much of interest, not only in the reading matter but in the advertising matter itself. It is a most attractive publication and you are entitled to great credit for it.

A letter from J. K. Punderford, president and general manager the Connecticut Company, reads in part:

This issue is particularly useful and informative both in the articles and advertising showing the trend. The *JOURNAL* staff deserves much credit for its contribution to the industry through this useful publication.

D. W. Pontius, vice-president and general manager Pacific Electric Railway, made this comment in his letter:

There is a great deal of interest to the industry in each issue of your pub-

lication, and it appears that the Convention Number contains some particularly good material.

I am unable to offer any suggestion which would be of any assistance in making the *JOURNAL* a better paper, because my judgment is that you are now furnishing a first-class, up-to-date publication.

F. D. Burpee, vice-president and manager the Ottawa Electric Railway, Ottawa, Canada, writes in part:

I have thoroughly enjoyed the Convention Number of the *ELECTRIC RAILWAY JOURNAL*. I have taken great pleasure in showing it to several of my friends who have dropped into my office, as an example of how well the street railway industry is looked after by its technical press. I particularly enjoyed the advertising matter. In fact, I am at a loss to suggest any means by which the Convention Number could have been improved. Please accept my sincere congratulations. I am sure I am only one of thousands of street railway men who find the *JOURNAL* a constant help in their every-day work.

A letter from H. J. Sheeran, president New York Railways Corporation, contains this comment:

To my mind this issue is the best and most comprehensive number ever published of this extremely interesting and efficient magazine. The articles, without exception, are splendidly written and well illustrated. That entitled "Surely the Road Opens Ahead" is most encouraging to those of us who have been confronted with varying degrees of adversity in recent years.

We are particularly interested also, at this time, in the comment on better results obtained through the use of up-to-date equipment, as well as in the news pertaining to buses.

Calvin A. Owens, president Florida Interurban Rapid Transit Railway, has this to say about the issue:

Permit me to congratulate you on your latest Annual Convention Issue of the *ELECTRIC RAILWAY JOURNAL*, which is a real contribution to the industry.

It is unfortunate that in the present era of prosperity constructive organizers are compelled to devote their attention to the subject of "Making Transportation Pay." Your splendid handling of the problem is set forth in a very interesting manner and I have no thought or criticism to add in any connection. I think you are to be congratulated in the amount of support you have secured from the advertisers, as most of their copy is enlightening to the reader, regardless of it being paid space.

f the Industry Reflected in the ne JOURNAL

A. R. Myers, president Erie Railways, writes as follows:

A copy of the Convention Issue has just come to my attention, and after a hurried perusal I can have nothing but praise for the efforts you have put forth, and the results obtained in building an issue that is not only attractive but filled with inspirational material that should be of great value.

The manufacturers are to be complimented on the ingenuity displayed in the presentation of their message, and I believe this issue could well be filed as a catalog of the products used in the industry.

Letters from many other executives contain similar comments regarding both the articles and advertising in this issue. Excerpts from some of these are printed below:

Walter H. Burke, manager Northern Texas Traction Company:

I want to congratulate you and the members of your staff on the 1926 Convention Issue of the JOURNAL. In my opinion it is the best of the many good issues you have published.

There no longer is much doubt in the minds of transportation men that "modernizing, popularizing and merchandising" offer the way out of the troubles the business has been through in the past ten years. This issue of the JOURNAL, along with the very successful convention at Cleveland, will surely go a long way to give added impetus to this idea.

S. B. Irelan, vice-president and general manager St. Joseph Railway, Light, Heat & Power Company:

Your Annual Convention Number this year of the ELECTRIC RAILWAY JOURNAL is, in our opinion, one of the best issues you have ever put out.

The featuring of the single subject "Making Transportation Pay" and making that the keynote for all of the comments and discussions of the various leaders of the industry in all parts of the country gives recognition to its importance and is impressive.

Today the transportation problem is perhaps in a little more critical state for all medium-sized cities than it is in the larger cities. It is our hope that you will continue to treat of the particular phases of the transportation problem in these cities as well as the larger systems.

R. R. Smith, vice-president and general manager Chicago, South Bend & Northern Indiana Railway:

Each year I look forward with anticipation to the receipt of the Annual Convention Number of the JOURNAL. I have never been disappointed in it.

This year the convention issue is exceptionally interesting and the outstanding problem of the day, "Making Transportation Pay," is presented in a very striking manner. The whole industry is indebted to you for this issue.

H. A. Nicholl, general manager Union Traction Company of Indiana:

This year's issue is a masterpiece and you have certainly handled the subject of "Making Transportation Pay" in an able manner. The men who wrote the various articles for you are all high-class operators and know what they are talking about, and if those executives who are in a position to follow the examples set for them do not take advantage of the situation they are not doing all they should for their properties.

The advertising matter in this issue alone contains a liberal education on electric railway and bus operation.

J. J. Coleman, operating vice-president and general manager Scranton Railway:

You have put out a splendid issue, and I think any railroad man will find his time profitably spent in going over it carefully.

A. C. Spurr, general manager Wheeling Traction Company:

You are certainly to be complimented on the Convention Issue of the ELECTRIC RAILWAY JOURNAL. It is indeed a handbook on making transportation pay and a ray of hope to many of the operators struggling with a collection of antique facilities.

My sincere hope is that you have a large circulation among those financially interested and responsible for street railway transportation.

I have no suggestions to offer on the make-up of the JOURNAL, as I believe you are doing an outstanding work in revivifying an industry that for a time lost its confidence. You are indeed builders of morale.

V. R. Powell, general manager the Peoples Railway:

You are indeed to be complimented on the thorough manner in which the industry is exploited in this Convention Number.

We think so much of the ELECTRIC

RAILWAY JOURNAL that we have recently interested our company in buying three additional subscriptions in order that each head of a department may be favored with a free subscription. We find that this is money well spent. With these three additional subscriptions we now have six subscriptions, each department head receiving a separate copy. We find that these are passed out to pivot men and foremen and that they are pretty well worn by the time they are returned for filing, which would indicate that those receiving them were very much interested and took advantage of the opportunity to acquaint themselves with the different angles of the industry in which they are employed.

John F. Collins, vice-president and general manager Michigan Electric Railway:

I think the issue is A-1 in every respect and I greatly enjoyed reading it. I have no suggestions to make regarding improvements.

W. H. Evans, manager of railways East Penn Electric Company:

Your Annual Convention Issue of the ELECTRIC RAILWAY JOURNAL is the best ever. While I have not had time to look at it from cover to cover, I assure you that it has been a great pleasure for me to read several of the articles which appeared in this issue.

It has also been an extreme pleasure to note how well the advertising pages have been prepared, and I wish to congratulate every member of the ELECTRIC RAILWAY JOURNAL staff, as it surely does show that some wonderful work has been done with untiring efforts.

G. W. Comfort, general manager Poughkeepsie & Wappingers Falls Railway:

While I have not as yet had an opportunity of reading this issue over thoroughly, I have glanced through same and herewith wish to compliment you on its compilation. It certainly is an issue which is a real inspiration and deserves commendation.

W. W. Foster, general manager Rochester, Lockport & Buffalo Railroad:

I have received a copy of your Annual Convention Issue and consider it a work of art, and as an ordinary layman can find no fault with it and cannot see where it could be improved, and I wish to congratulate you.

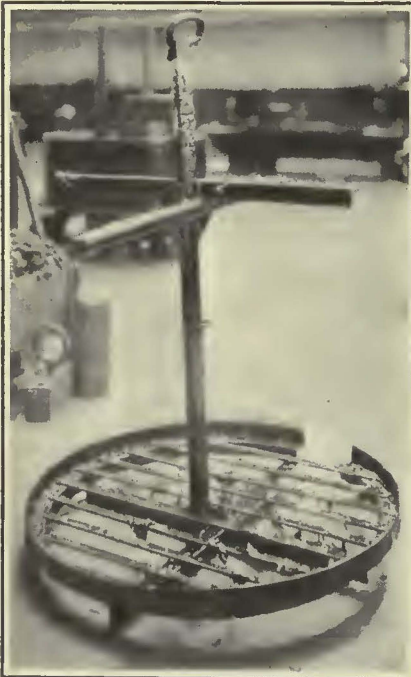
ELECTRIC RAILWAY JOURNAL takes this means of publicly thanking those railway executives who made this issue so successful by contributing of their time to tell the industry the results of their own experiences in "Making Transportation Pay." At the same time the JOURNAL wishes to acknowledge these many letters of friendly comment and to thank its readers for this evidence of interest and co-operation.

Charles Gordon
Editor

Maintenance Notes

Handy Tree for Dipping Small Coils

VARIOUS devices have been used to facilitate the dipping of a large number of small coils at one time. A device which has been found to work out very successfully in the department of electrical repairs of the Brooklyn-Manhattan Transit Corporation is shown in the accompanying



Field and Other Small Coils Are Dipped Conveniently by Using a Device as Shown

illustration. This consists of a circular base with straps across to support small pieces of equipment and a vertical post with two cross-arms arranged so that coils can be hung on these. The circular bridge is constructed with two 1½-in. x 1½-in. angles as the outside supporting ring. Cross-straps 1 in. wide x ¼ in. thick are riveted to the circular rim. As a further support two 1½-in. x 1½-in. angles are placed underneath and the upright, which is a 2-in. x 2-in. angle, is riveted to this. The cross-arms at the center part of the upright are 1½-in. x 1½-in. angles and are 3 ft. long. The opening in the outside rim of the base, as seen in the illustration, is so that this will fit over a pipe connection inside the

tank as the various equipment is being dipped. In ordinary operation coils are hung on the cross-arms and other coils are placed on the bottom circular support. A ring at the top provides for convenient handling with overhead hoist or crane.

The rattle of the armature windings, like the rattle of a snake, should be a warning. "Operators, why not 'dip and bake'?"

Old Lathe Bed Serves as Base for Commutator Slotter

SLOTTING commutators with a home-made apparatus has proved very satisfactory in the shop of the Berkshire Street Railway, Pittsfield, Mass. Possessing an old lathe bed and a small motor of fractional horse-power it was decided to rig up a slotting mechanism which could be adapted to commutators on any of the armature sizes in use by the railway. The motor is accordingly mounted on the wall directly in the rear of the slotter and connected thereto by a flexible shaft which transmits the torque from the motor to the shaft on which the slotter is mounted.

As indicated in the accompanying illustration, both horizontal and ver-

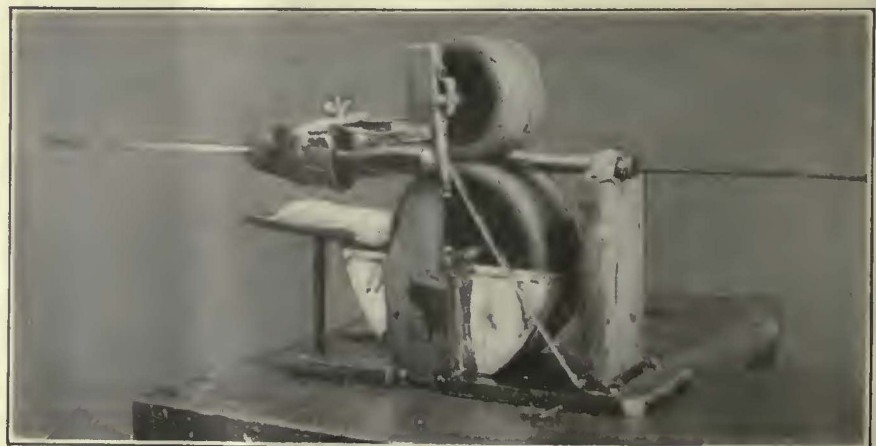


Slotter Is Here Shown Suspended Directly Above a Commutator Which Is Ready for Slotting

tical adjustment in the slotter may be accomplished, the first by moving the collars on the rods shown above the slotter blade back and forth in a direction parallel to the armature shaft, while the latter is effected by simply raising or lowering the slotter mechanism on the vertical shafts shown directly above the end of the armature shaft. Movement of the slotter is easily controlled and it is possible to slot an entire commutator in a very few moments.

Window Stripping Quickly Varnished in Cleveland

SMALL wood strips used for molding or for holding the glass in place in car windows are quickly stained or varnished by the machine illustrated, which was recently constructed in the Harvard shops of the



Window Strip Quickly Painted by Machine in Cleveland Railway Shop. Felt-Covered Wheels Cover the Strip with Stain or Varnish as the Material Is Pushed Through



This Car Side Has Been Entirely Rusted Through by the Water Encountered in Operation



The Unsightliness of the Rusted Side Is Obviated Through the Use of Steel Plates Similar to the One Pictured Here

Cleveland Railway. The strip to be painted enters through the core of the machine from the right-hand side and passes through two felt-covered wheels, one of which dips in a tank of stain or varnish at the bottom. When the strip emerges from these rolls the paint material is thoroughly rubbed in by the brushes supported on the left in the view. This also removes the surplus material, which drops into the trough below and then runs back into the supply tank.

While the brushes used are of the ordinary commercial type, it is planned to have one specially constructed to do this work.

Repairing Car Sides Which Have Become Badly Rusted

CONSIDERABLE difficulty has been experienced by the Portland Railroad, Portland, Me., with rusting out of steel car sides. Unusually severe water conditions are encountered in Portland and it is also necessary to use a large amount of salt in keeping the switches clear. Thus a continual spray of semi-frozen brine is thrown upon the car sides, particularly between the sills and the car floors. This results in a severe rusting of the steel sheathing from the inside.

To meet this condition the railway uses four steel plates, similar to the one shown in the right hand illustration, to cover the rusted portions of the car sides. The most serious rusting always occurs near the middle of the car and it is seldom necessary to do more than to add the triangular plates at each side of the center doors. If it is necessary to attach a single plate the three other sides are similarly equipped regardless of the degree of rust at those points. This is done to preserve the general well-

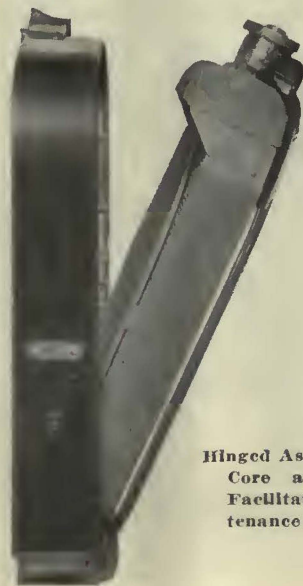
balanced appearance of the car. Steel plates of $\frac{1}{2}$ in. to $\frac{3}{8}$ in. thickness are used for this purpose.



Radiator Core Easily Removable

EXHIBITED on the chassis of the Liberty Motor Vehicle Company at the Cleveland convention was a specially designed Perfex radiator, built by the Racine Radiator Company, Racine, Wis. Several newly developed features were incorporated in the design of this radiator.

The shell is permanently bolted directly to the dash and fits snugly up against the hood. The core and tank assembly is hinged at the bottom, so that the core may be quickly and easily removed by taking off two nuts at the top and two at the bottom. It is not necessary to disturb

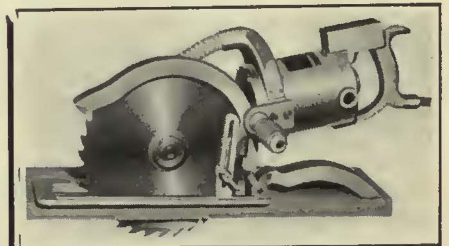


Hinged Assembly of Core and Tank Facilitates Maintenance Work

the shell at all. Both top and bottom tanks are cast material, built to withstand every vibration and road shock to which a bus might be subjected. The core is a standard bronze unit design used by Perfex. The shell is cast duralumin, polished and enameled to withstand corrosion and wear.

Convenient Electric Hand Saw

PORTABILITY is the feature of an electric hand saw weighing about 24 lb. that has been brought out by the Wodack Electric Tool Corporation, Chicago, Ill. The motor



This General Utility Power Saw Saves Much Time. It Is Readily Adjustable

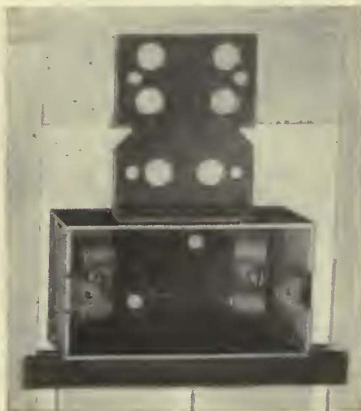
with which this tool is equipped is sufficiently large to drive an 11-in. circular saw and yet may be operated from the ordinary electric light socket supplying 110 volts. The saw is capable of cutting a 4-in. x 4-in. timber in less than two seconds and is of particular value in doing rough carpentry work where speed is the primary requisite.

The saw is fitted with a depth gage, so that it is necessary only to cut through a timber to the depth required. In addition to regular carpentry work the saw is well adapted, due to the depth gage feature, for use in opening shipping boxes and crates, it being possible to saw the exact depth of the board or box cover, thereby preventing any injury to the contents of the box.

Switch and Receptacle Boxes

FOUR-INCH switch and receptacle boxes, suitable for wall bracket outlets due to their larger size, have been developed by the Chicago Fuse Manufacturing Company, Chicago, Ill. These boxes are obtainable in both the "Gem Locktite" and "Gem Bracket" types.

The Gem 4-in. Locktite box has the same steel supporting bars as the standard boxes of this type developed heretofore. This makes it well adapted for quick, secure mounting. It may be installed in



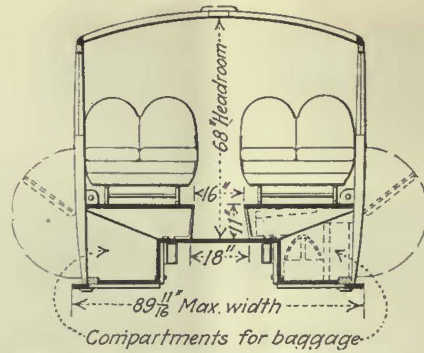
Four-Inch Locktite Box

either the perpendicular or horizontal position and is provided with knockouts for loom, sheathed cable, flexible and rigid conduit. It has a provision for a fixture stud in the bottom of the box.

The 4-in. bracket boxes are similar in design. The bracket attachment makes installation easy and quick, no mounting bars being required. The ears in both these boxes are turned in so that the center distance between the drilled and tapped holes is the same as for standard boxes, and all switch and receptacle plates may be used.

Bus Body with Baggage Compartments Under Seats

CONVENIENCE of entrance, ease of walking down aisle and provision for storage of baggage below the center of gravity of the chassis feature a new intercity bus body the Lang Body Company, Cleveland, Ohio, has just brought out. This provides space so that some 40 pieces of baggage can be carried in receptacles under the seats which are in locked, water-proof and dirt-proof compartments controlled by the operator and easily accessible at all times. The over-all height of this



Cross-Section Showing Compartments for Baggage and Seating Arrangement

bus is less than that of similar bodies with baggage racks, and this construction insures a comfortable seat in all positions of the bus with a clear and pleasing road vision.

The body has been built for and is mounted on a new Mack AL six-cylinder chassis.

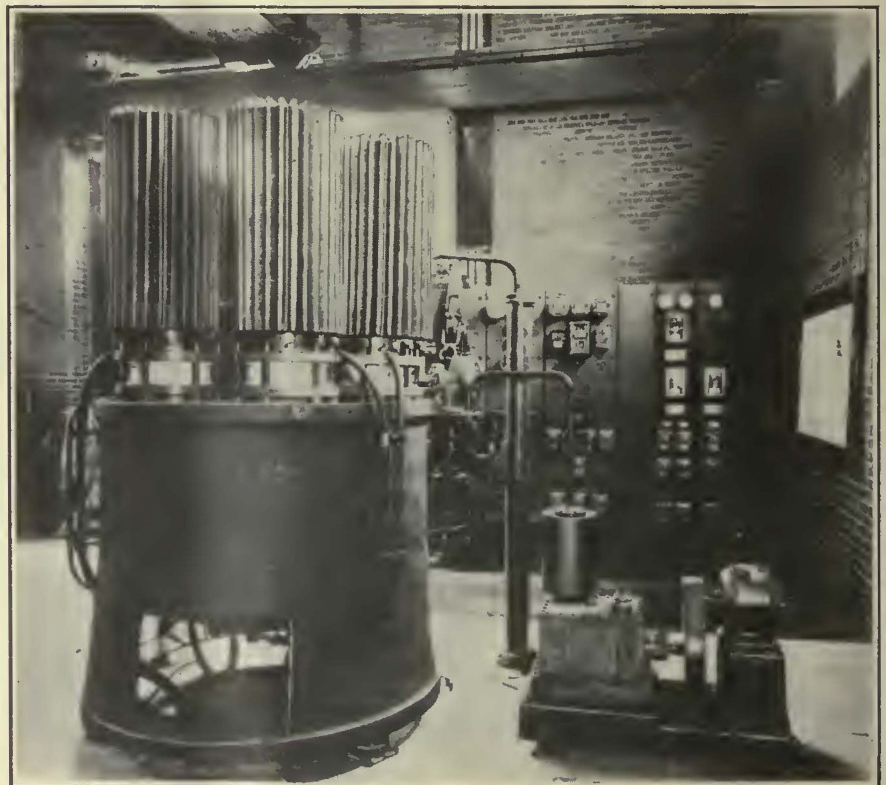
Another Type of Mercury-Arc Rectifier

THE appearance of a new design of mercury-arc rectifier in the booth of the Westinghouse Electric & Manufacturing Company at the Cleveland convention marks the first time that this company has put forward this equipment to the industry. The design of the Westinghouse company in outward appearance resembles those of other manufacturers of arc rectifiers. It operates on

the same principle as the glass mercury-arc rectifiers which have been used for battery charging and similar applications for a number of years. The inner steel tank is vacuum tight and capable of retaining a degree of vacuum of 1/1,000,000 atmosphere. Vacuum pumps and gages form a part of the equipment.

The unit shown in the Cleveland exhibit was an exact duplicate of the unit which has been placed in service in substation No. 16 of the Cleveland Railway, as shown in the accompanying illustration. Rectifiers of this design are commercially practicable for power conversion for voltages of 500 d.c. and over and for currents of 500 amp. or greater. They are thus particularly practicable for railway service. The same unit can also be applied for a wide range of voltage applications when used with the proper ratios of transformers. The current capacity decreases slightly with higher voltages, but the efficiency raises as the voltage increases.

The rectifier holds some advantages over the synchronous converter, such as improved full load efficiency, correspondingly higher efficiencies at low loads and the absence of moving parts except in the motor-driven pump, which is operated intermittently. The lighter weight of the rectifier generally will permit economies in substation construction.



Mercury-Arc Power Rectifier in Service in Substation No. 16 of the Cleveland Railway

Association News and Discussions

Utility Commissioners Meet Nov. 9-12

WILLIAM A. PRENDERGAST, chairman New York Public Service Commission, will deliver one of the principal addresses at the 38th annual convention of the National Association of Railroad and Utilities Commissioners, to be held at Asheville, N. C. Mr. Prendergast is chairman of the association's public utility rates committee, and in addition to delivering an address to the convention will submit the report of his committee. Regulation of interstate motor vehicle carriers will be one of the chief topics of discussion at the convention this year. Water power and its regulation, which, when the association was formed, was considered far beyond its jurisdiction, also will be a leading topic for the consideration of the convention.

The convention will last from Tuesday, Nov. 9, until Friday, Nov. 12. There will be special addresses by Commissioner John J. Esch of the Interstate Commerce Commission, M. H. Aylesworth, former chairman of the Public Utilities Commission of Colorado; John A. Small, president of the National Rivers and Harbors Congress; Alexander Forward, formerly a member of the Virginia Corporation Commission; C. C. McChord, former chairman of the Interstate Commerce Commission, who will speak on the subject of "Regulation of Interstate Motor Vehicle Carriers"; Edward W. Bemis, public utility expert of Chicago, and H. A. McKeown, K. C., chief commissioner of the Board of Railway Commissioners for Canada, who will speak on the subject of "Regulation in Canada."

The convention sessions will be held at the Battery Park Hotel, which is also to be the headquarters of the association.

S.A.E. to Discuss Bus and Truck at Meeting Nov. 16-18

TRANSPORTATION — the latest methods of passenger and freight carriage by motor—will be delineated in the national meeting of the Society of Automotive Engineers to be held on Nov. 16-18 in Boston, Mass., at the Copley Plaza Hotel.

The meeting will be divided into five technical sessions, at which some of the most interesting subjects to railway men will be the presentation of the following: "Economics of Co-ordination of the Railroads and Highways" by W. J. Cunningham, professor of transportation of the Graduate School of Business Administration of Harvard University; "Motor Coach and Railroad Operation, Co-ordinated" by A. P. Russell, president of the New England Transportation Company of Boston; and "Economics of Motor Vehicle Transportation Correlated with Steam

and Electric Railroads" by G. L. Wilson of the Wharton School of Finance and Commerce of the University of Pennsylvania.

Another session will be devoted to freight handling. F. I. Hardy, assistant to the chairman of the executive committee Boston & Maine Railroad, will discuss "Co-ordination of Railroad and Trucking Operations." W. P. Kellert, consulting engineer of Brantford, Ontario, will talk on the "Co-ordination of the Container with Rail and Road Transportation Facilities." At the motor coach and truck operation session, G. T. Seely, vice-president of the Chicago Motor Coach Company, will talk on "Modern Motor Coach Operation."

American Association News

Committee on Education Urges Co-operation

EDUCATIONAL directors of electric railway properties are urged to cooperate with the committee on education of the American Electric Railway Association by sending in their names to Edward Dana, the newly-appointed chairman of this committee, who is compiling a directory of such data. In order that every railway company may be represented in this new compilation, this information is requested promptly.

Replies should be directed to Edward Dana, general manager Boston Elevated Railway, Boston, Mass. Information is desired in the following form: name of director, name of company, address, title of director.

Public Service Section Opens Season

WITH more than 400 railway men of New Jersey attending, the Public Service company section of the American Electric Railway Association held its first fall meeting Oct. 21 in the auditorium of the Montgomery Street carhouse in Jersey City. The A.E.R.A. members were the guests of the Boosters Club, a get-together organization of railway men in the Hudson Division of Public Service. Robert Hoos, president of the Jersey City Chamber of Commerce; Joseph F. Autenreith, president of the State Board of Public Utility Commissioners, and Edmund W. Wakelee, vice-president in charge of law, Public Service Corporation, were the speakers.

David Alberts, president of the Boosters Club, opened the meeting and then turned it over to A. T. Warner, president of the company section, who presided and introduced the speakers.

COMING MEETINGS OF Electric Railway and Allied Associations

Nov. 5—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p. m.

Nov. 9-12—National Association of Railroad and Utilities Commissioners, annual convention, Battery Park Hotel, Asheville, N. C.

Nov. 16-18—Society of Automotive Engineers, National Transportation and Service Meeting, Boston, Mass.

Nov. 17-18—Iowa Electric Railway Association, operating and maintenance section, annual convention, Fontanelle Hotel, Omaha, Neb.

Nov. 17-18—Central Electric Traffic Association, regular meeting, Fort Wayne, Ind., Keenan Hotel, 9 a. m.

Dec. 6-9—American Society of Mechanical Engineers, annual meeting, New York City, Engineering Societies Building.

Metropolitan Section to Continue Activities

RELATIONSHIP between transportation and community development will be the subject of discussion at the second meeting of the season of the Metropolitan Section, A.E.R.A., to be held Friday, Nov. 5, at the Engineering Societies Building at 8 p.m. A Dutch treat dinner will be held at 6 o'clock at Friedlander's restaurant, on 39th Street opposite the meeting place.

The program for the evening includes addresses by L. S. Miller, president New York, Westchester & Boston Railroad, on "Team Work Between Transportation Companies and the Communities They Serve," and C. S. Ching, supervisor of industrial relations United States Rubber Company, on "The Transportation Man in Civic Affairs." High spots of the Cleveland convention will be the subject of remarks by Guy C. Hecker. Officers for the ensuing year will be elected at this meeting. The usual entertainment features will be part of the evening program.

Helpful Hints on Electric Railway Advertising

ELECTRIC railway men interested in advertising may get helpful suggestions from the 2,000 ideas presented in a looseleaf folder prepared by Labert St. Clair, director of advertising of the American Electric Railway Association. Complimentary copies of this booklet are available to each member company upon request. Non-member companies may receive them upon payment of a small fee. Mr. St. Clair points out that there are enough definite advertising suggestions in this compilation to last the average company at least five years.

The News of the Industry

Franchise Discussion Renewed in Kansas City

About 50 petitions for a referendum on the extension of the present railway franchise were placed in circulation in Kansas City, Mo., on Oct. 22.

This action was started to nullify the approval by the City Council of an ordinance extending the present franchise for a period of twelve years in favor of the Kansas City Public Service Company, the successor under foreclosure to the Kansas City Railways.

The petitions, to become effective, must bear something over 12,000 signatures of voters.

In the meantime, a committee of the Council appointed to consider plans for an entirely new franchise is meeting at intervals with William G. Woolfolk, president of the new company, or with his representatives, in an effort to complete the tentative draft of the new franchise document within the next 30 days, if possible.

Chicago Traction Ordinance May Be Made Political Issue

The first real indication that a political issue will probably be made of the pending traction ordinance in Chicago came to light at a conference on Oct. 20 between the City Council and Chicago Surface Lines officials. Patrick J. Lucey, attorney for the Chicago Rapid Transit Company, insisted that the home rule provision in the proposed franchise be dropped.

"The traction referendum is coming very near a mayoralty election, and if we drop the home rule feature it will be the issue of every candidate for Mayor and the Council," Alderman Jacob Arvey explained to the elevated lines' representative.

Asked by other Aldermen if he thought any ordinance would be passed if it left control of the transportation companies with the Illinois Commerce Commission, Mr. Lucey replied that, in his opinion, local regulation was passing and the public did not care so much about who runs the street cars as it did about good service.

D. S. McKinlay, chairman of the traction sub-committee of the City Council, declared that the city was approaching a settlement by agreeing to a terminable permit. He believed, however, that the provision for home rule by a city commission must be adopted in the ordinance in spite of the risk that the Legislature may fail to pass enabling legislation and so nullify it.

At another meeting, on Oct. 22, Leonard A. Busby, president of the Chicago City Railway, submitted figures showing that the companies have spent \$1,700,000 in the twelve years ended Jan. 31, 1926, for track changes due to street widenings and regradings. He

held this to be an unjust burden on the car rider.

Corporation Counsel Francis X. Busch held, on the contrary, that it should be retained in the ordinance. If the division of costs is left to the courts, he said, the resultant legal red tape would jeopardize all future street improvements.

In the new ordinance, a draft of which is now being prepared by Mr. Busch, two controversial points are to be left open, namely, the evaluation of the systems and the amount to be allotted for maximum capital expenditures.

Eight-Cent Cash Fare in Duluth

Litigation between the Duluth Street Railway, Duluth, Minn., and the city of Duluth took on a new turn recently when the Minnesota Railroad and Warehouse Commission issued an order increasing fares in Duluth from 6 cents straight to a cash fare of 8 cents with the option of purchasing tokens good for one ride at the rate of five for 35 cents.

The fight for an increased fare on the part of the company began in 1921 when it sought to boost a 5-cent fare to 6 cents. The Railroad and Warehouse Commission granted the 6-cent fare, but provided that if tickets were purchased the rate should be five rides for 25 cents. The company obtained an injunction from the federal court against the enforcement of that portion of the order which called for a 5-cent rate for five rides. The appeal of the city and the state from the decision of the federal court is now pending in the United States Supreme Court.

Cleveland Welcomes Its New Traction Chief

The directors of the Cleveland Railway chose the logical man to succeed the late John J. Stanley as president—logical not so much because Joseph H. Alexander was next in line for the office as because the new chief by character, training and hard experience had specifically fitted himself for it. Both in private practice of his engineering skill and in war service Alexander has shown his ability to handle the kind of problems that the directorate now give him to solve.

With Stanley passed the old régime in local transportation. The new comes in with Alexander. The late president, climbing by the ladder of hard knocks, made himself a figure in the community. His successor, with more training on the technical side, has an even better opportunity. Cleveland welcomes the new traction chief.—*Cleveland Plain Dealer.*

Five-Cent Fare Referendum Barred in New York

The proposed referendum on a 5-cent fare cannot go on the ballot in the coming New York City election on Nov. 2. The Court of Appeals so decided in an opinion handed down on Oct. 22. This decision reversed the opinion of the lower courts.

The 5-cent fare referendum was adopted as a local law by the Municipal Assembly under the city home rule law and signed by Mayor Hylan on Sept. 17, 1925. The local law made it illegal for the Board of Estimate to authorize or effect any change in rapid transit contracts for the purpose of increasing the fare above 5 cents, or to grant any bonus or subsidy, or to consider such a proposal until after it had been submitted to the voters upon a referendum and had been approved by a majority.

The law also provided that such a referendum could not be submitted to the voters unless a petition had been filed signed by 15 per cent of the voters at the last previous state election.

It had been hoped to place such a referendum before the voters at the 1925 elections, but Frank J. McCabe, a taxpayer, the relator in the suit just decided, brought a similar action in 1925 for the same purpose and the court decided there were not the required 90 days between the date of the passage of the referendum resolution by the Municipal Assembly on Sept. 17, 1925, and election.

The latest action was an application for an injunction restraining the Board of Elections from submitting the proposed referendum to the voters at the coming election.

Birmingham Goes After Coffin Award

Officers of the Birmingham Electric Company, Birmingham, Ala., through the *Buzzer* announce the impression made upon them by the exhibits at the recent convention of the American Electric Railway Association of the railway companies which competed for the Charles A. Coffin award, won by the Pennsylvania-Ohio Electric Company. H. E. Cox, assistant general manager at Birmingham, states that the existence of cordial relations with employees, public and management went far in aiding the company to win the honor of being the most distinguished contributor to the industry in 1925-26.

Mr. Cox recommends a union of efforts in Birmingham in co-ordinated teamwork so that next year the record of the Birmingham Electric Company will be foremost among the competing companies. He urges all alike to make a good job of it and thereby help to win the Coffin award.

Mass Carriers Found Supreme in Chicago "Loop" Traffic Check

In a report following a ten months study of street traffic conditions recently completed by Miller McCormick, director of the Albert Russel Erskine Bureau for Traffic Research, and submitted on Sept. 24 to the Chicago Association of Commerce it established that the downtown streets of Chicago carry 846,753 persons and 314,610 vehicles on an average week day, a greater traffic density than in any other city in the United States.

This congestion is made worse, Mr. McCormick points out, by horse and buggy parking practices, a lack of wide streets and high speed arteries, too much jaywalking, and archaic traffic laws.

In co-operation with the department stores, banks, restaurants, and other business institutions, a cordon count of the "loop" district was made last June. More than 96,000 shoppers were interviewed on a typical week day to secure information on the transportation which these store visitors utilized in coming to the "loop." The check-up showed that only 8 per cent drove their cars into the central business district and a bare 1.57 per cent left their cars at the curb to add to the disastrous street conditions which now prevail in the "loop." In other words, the practice of parking accommodates only 15 out of every 1,000 shoppers, while the overwhelming majority of 985 are, as a result, jammed at street intersections, delayed on street cars and buses and otherwise so discommoded as to drive them to the neighborhood stores.

In no loop business house did the percentage of car-parking patrons exceed 3.2 per cent, said Mr. McCormick, in commenting on the tally. He said:

From this study the conclusion is warranted that curb parking is not supplying a considerable part of the patronage of business houses in downtown Chicago. As a matter of fact, interviews with 96,082 patrons show that more than 19 per cent came to the "loop" on suburban trains, 33.8 per cent on elevated trains, 26.2 per cent on street cars, 11.4 per cent on buses, and slightly more than 1 per cent arrived in taxicabs. From these figures it will be seen that the largest feeders of loop patronage are the mass carriers and not private automobiles.

Among the recommendations for relief which the Association of Commerce contemplates making to the City Council as a result of this \$50,000 traffic survey are drastic curtailments in, if not entire elimination of, parking, new arteries, more light controls and other traffic regulations.

Seattle Recommendations to Become Effective

Mayor Bertha K. Landes of Seattle, Wash., has instructed David W. Henderson, superintendent of the Seattle Municipal Street Railway, to put into effect, as soon as practicable, recommendations in the Jackson street railway report which it has been estimated will result in reducing expenses approximately \$100,000 a year. The report was prepared by Clark R. Jackson, superintendent of utilities, and deals mainly with elimination or curtailment of shuttle car service. No conclusion has been reached, the Mayor said, re-

garding the proposal to establish a loop system, the chief recommendation in the report, which it is estimated would save \$500,000 a year. The Mayor states that more time will be devoted to a study of the loop plan, and that while it might not be possible to adopt the proposed program in its entirety, it may be used as a working basis in making changes that would materially reduce operating costs.

Kansas City Valuation Discussed

Approximately a \$25,000,000 Price Put on Properties by Dean Riggs—Service-at-Cost Plan Recommended

Dean H. E. Riggs of the University of Michigan, appearing on Oct. 22 before the special Council committee at Kansas City, Mo., placed the value of the properties of the Kansas City Public Service Company at approximately \$25,000,000. He said that if Kansas property of the local company were to be included the valuation should be set at \$28,000,000.

Having valued the railways property for the federal court in 1925, Dean Riggs was invited to appear at the committee meeting. He said that he had not been in touch with the property for several months and that he had been admonished by the federal court not to state his personal opinion of the valuation of the property, but to consider the situation from all angles, submitting reports of valuations based on the various theories used by engineers in making previous valuations.

Mr. Riggs pointed out that while his report had been submitted to the court in August, 1925, it was based on the value of the property as of Dec. 31, 1924, and that he was not in a position to discuss the matter of property additions since Jan. 1, 1925.

The valuation at that time, made on bases of historic cost at the time of initial investment, cost of reproduction at the latter date and on various intermediate bases, ranged from \$24,216,884 to \$48,985,402 for property in Missouri only.

In replying to a question as to what valuation he would suggest be written into the new franchise at this time, Mr. Riggs said:

For these negotiations the figure would lie between \$20,500,000 and \$34,500,000, or about \$25,000,000 to \$26,000,000 for rate-making purposes. This includes only the property in Missouri, but as this will have to carry the burden of the property in Kansas, that also should be taken into consideration. In that event, I would place the value at somewhere in the vicinity of \$28,000,000.

If the property in Missouri is put into good shape it should be able to carry a valuation figure of about \$25,000,000.

Professor Riggs recommended the service-at-cost plan as beneficial in arranging a new franchise grant. He expressed himself averse to the indirect taxation features of the present Kansas City franchise, providing for the paving between car tracks and the payment for use of viaducts and for street cleaning by the operating company. He intimated the exclusion of such demands in the new franchise might tend to reduce fares under a service-at-cost plan.

An ordinance which excluded these

provisions from the franchise was killed by the local Council previous to the passage of the twelve-year extension of the present franchise. At the time the view was expressed that the operating company should continue to pay such assessments or charges.

Dean Riggs warned that to fix the valuation of the property at a figure too high would, in his opinion, merely cause the company to revert to receivership at some later date. He thought a minimum return of 8 per cent fair.

William G. Woolfolk, president of the Kansas City Public Service Company, and Timothy F. Mullins of Chicago represented the new company at the hearing. Mr. Mullins was appearing in the absence of Bennet C. Clark, who was ill in St. Louis at the time.

The committee meeting was adjourned until Oct. 28.

More Antiquated Cars Burned

Ten obsolete cars of the Key System Transit Company, Oakland, Cal., have been burned on the Key Mole and 31 more are to follow. These cars have been replaced by an equal number of modern type on the lines of the system. They were removed from active service some time ago.

The metal parts, motors, headlights and other useful portions were removed before the cars were towed to the Keel station on the mole, where the torch was applied. Thousands of people watched the unusual sight of the burning vehicles. As the cars were towed to their final destination on their own wheels wreckers tipped them off into the marsh where they were burned one after another.

No ceremony attached to the cremation, but one enterprising East Bay newspaper took movies that were later shown at an Oakland theater.

Increase in Fare Asked in St. Louis

Early action is expected by the Missouri Public Service Commission on the application of Receiver Rolla Wells of the United Railways, St. Louis, for permission to raise fares from 7 cents pending an audit of the company's books. This latest application for higher fares does not stipulate the rate desired, but suggests a rate that will enable the company to meet operating expenses and pay a fair return on at least the 1919 valuation.

Receiver Wells filed his application on Oct. 23. He asserted that since June, when the company filed a prior application for an increase in fares to 8 cents, or two tokens for 15 cents, the company has lost \$506,000 and that revenue will fall about \$116,000 short of expenses of operations each month the present fare of 7 cents is continued.

The new petition further sets forth that in 1925 the company earned less than 5.2 per cent on the valuation of \$51,781,348 as of Jan. 1, 1919, fixed by the commission, and that since that time \$4,948,787 had been spent for additions and betterments. For the year ended on Aug. 31, 1926, the railway system earned less than 5.4 per cent on the 1919 valuation.

Mayor Victor J. Miller and other city

officials are expected to oppose any immediate increase in fare. When the application was filed last June the city insisted that the commission defer hearings on the petition until an audit had been made of the company's books. The request was also made that the accounts of the city and county lines be separated.

Recently Mayor Miller is said to have

informed company officials that he would not consent to an immediate increase in fares even of a temporary nature, but would insist on delay until the audit had been completed. Auditors of the state commission are now at work on the company's books.

It has been the policy of the commission to grant temporary relief where losses are apparent.

portion of the freight charges, a practice forbidden by the commission.

The receivers of the railway contend that payment of the fees in question is necessary to the prosperity of the road, much of the revenue of which comes from ore shipped from lead and zinc mines in Missouri, Oklahoma and Kansas.

"Two-Bit" Football Tickets for Pittsburgh's Sixteens

What does it matter that the day of the 5-cent shave has gone forever, when a new era has dawned in 25-cent football games. In Pittsburgh, boys and girls who are sweet sixteen and proud possessors of quarters are sitting on top of the world, namely, Forbes Field, yelling

PI-TT-PITT
PI-Double T
PITT

While Baltimore debates over the propriety of donning spats to welcome a queen, New York shakes the greasy hand of its latest aquatic marvel and Philadelphia cogitates the practicability of a 1927 Sesqui, Pittsburgh has suffered the little children to come into it and they have found the Kingdom of Heaven. Their good fortune came about through a plan developed by the Pittsburgh Railways, the Pittsburgh Post, the University of Pittsburgh and the Carnegie Institute of Technology to make the school-less Saturday a real holiday. The idea embraced transportation to the football games and back home, as well as admission into the huge athletic bowl reserved for their exclusive use, and all this for 25 cents.

The special football-street car pass is good on all lines of the Pittsburgh Railways except the interurban lines (Washington and Charleroi) between the hours of 1 p.m. and 6.30 p.m. on Saturdays. It is available at all offices and news agencies of the *Chronicle Telegraph*, the Pittsburgh Railways' 30 ticket agencies and the Equitable Sales Company offices. More than 3,500 youngsters swamped offices to procure combination pass and admission tickets for the Tech-Adrian game on Oct. 9. These grid fans swelled the receipts of the Pittsburgh Railways by \$450. On Oct. 16, when the University of Pittsburgh played Colgate, it is estimated that the youthful fans turned in \$800 to the local property. On this day the usual "kick-off" thrill was enhanced by the assigning of a corp of special cheer leaders recruited from the university staff to the children's sections. Records do not show how many of the youthful spectators decided on that day just what their life work would be, but judging by their enthusiasm for the art of cheering and their ability to translate their ardor into husky yells the universities will not lack for any such boosters when a few more autumn solstices come around.

Pitt Stadium will again welcome the juvenile members of the Post Athletic Club on Oct. 30, when Pitt meets Westminster, and again on Nov. 11, for the Tech-Juniata game, proving that in Pittsburgh, anyway, at least four thrills come in a lifetime. Of course, the same reservations hold good—you must be still sixteen if not sweet, and you must have that good old quarter or five nickels.

St. Petersburg Road Up to Date

Small Municipal Line a Model, but Is Run at Loss—Large Sums Spent on Improvements—Bus Lines Supplementing Railway Service

ST. PETERSBURG'S railway system has entered the eighth year of public ownership under supervision of Director R. E. Ludwig, head of the public utilities department. Additional improvements in the plant, rolling stock, rail extensions and general equipment, authorized in the sum of \$400,000 by the bond issue voted last fall, are now under contract and construction.

During the seven years that the railway has been under municipal operation the receipts have amounted to \$1,410,236. The record of receipts follows:

1919-20.....	\$89,302
1920-21.....	127,628
1921-22.....	151,582
1922-23.....	179,114
1923-24.....	218,570
1924-25.....	270,819
1925-26.....	373,218

During the last fiscal year, ended June 30, 1926, the railway showed operating profits of \$54,397, an income of \$373,218 and assets of \$855,477, but an actual net loss of \$19,405 was caused as the result of costs of extensions and improvements and deductions for interest on bonds which amounted to \$73,803.

DETAILS OF NEW BOND ISSUES

At the original sale of the old lines, the St. Petersburg & Gulf Railway was taken over for \$165,000 by a group of Northern capitalists who held mortgages on the property amounting to \$250,000. Under an agreement with an option to purchase, the city of St. Petersburg began operation of the lines July 1, 1919. By a vote of 350 to 103 on a referendum election, citizens authorized a bond issue of \$250,000 for the purchase of the railways Aug. 30 of that year. They bought eight street cars, four of which are still in use as work and repair cars, and lines to Gulfport, the Jungle, Big Bayou and the North Shore, with cars operating on a two-hour schedule, compared with the ten and twenty minute schedules now adopted. Of the original bond issue voted for the purchase and reconstruction, \$22,000 was devoted to equipment, \$28,500 for repairs to roadbed and tracks and \$175,000 for the right and title to the old railway.

During the first five months of operation by the city, other bond issues totaling \$480,000 were voted for the purchase of rolling stock, construction of extensions, double tracking and general improvements. Since that time many other improvements and extensions have been made.

All general improvements and operation of the railways have been handled

as direct charges against revenue funds without taxes and with no increase in the fare of 5 cents. In addition the municipal railways division of the public utilities has provided for a sinking fund, depreciation charges and interest on bonds.

Provision for further improvements in the local municipal railways system were made in a bond issue voted last November which authorized an expenditure of approximately \$400,000. Much of the work has already been completed, while the balance is either in the course of construction at this time, as at the new carhouse adjacent to Ninth Avenue north, or in preparation under specifications now being drawn up.

The new improvements include:

The purchase of eight double-truck cars, \$100,000.

Reconstruction and extension of tracks, including special work and passing tracks for necessary improvement of schedules, replacement of light rails by heavier, \$19,650.

Extension on Ninth Avenue north, \$59,230.

Erection of carhouse, including paint shop and offices, together with repair pits and equipment, \$105,284.

Construction of track from Ninth Street north to shops, \$55,739.

Tracks in yard at carhouse for material storage and track usage, \$31,977.

Extension of tracks to create a loop up First Avenue north to Ninth Street, \$15,000.

In addition to the amounts voted for actual railway improvements \$235,000 was allowed for the purchase and installation of two new units at the municipal power plant.

During the last three months the transportation system has been supplemented with two lines of buses operating eight 21-passenger coaches north and south through the main traffic lanes of the city not reached by the electric cars.

The railway as now run comprises 27 miles of line.

Railway Seeks to Justify Refunds

A special hearing was held at Kansas City, Mo., on Oct. 16 before three federal judges on the application recently filed by the receivers of the Southwest Missouri Railway, Joplin, Mo., for a restraining order to prevent the Interstate Commerce Commission from enforcing its order issued against the company last August.

The commission's order forbade the receivers of the railway paying fees to truckers hauling ore from mines to the cars of the company. The commission in issuing the discontinuance order contended that the payment of such fees amounted to a rebate to the mines of a

Through British Eyes

A Recent Interested Observer of American Affairs Was Mr. Bellamy of Hongkong

L. C. F. Bellamy, a delegate from Hongkong to the convention in Cleveland, took advantage of his trip to the United States to visit a number of properties other than that at Cleveland. From Cleveland he went to Philadelphia to study co-ordinated transit, but more particularly to study the trackless trolley line in that city. There is agitation at Hongkong for transportation by bus, but Mr. Bellamy does not look with sympathy on that vehicle for use there. Many difficulties would attend the operation of gasoline passenger vehicles in public hire there, but the principal objection to the use of the bus is on the basis of the cost of petrol. The price of this fuel in Hongkong is about three times the price in England, and that price, as is well known, is much more than the price in the United States.

On the other hand, Mr. Bellamy is not completely sold on the trackless trolley, but he favors that form of transport under the conditions at Hongkong, and he may so report to his directors. His visit to the United States is a flying one and before the end of the month he expected to be on his way across the Pacific. His plan was to stop in Chicago to watch again the operation of the system there, but he did not intend to visit New York, in which conditions on transport are regarded by him to be abnormal—abnormal in that they do not represent average conditions.

Mr. Bellamy is very well informed on American political conditions, both national and local, and manifested the Briton's natural curiosity about the effectiveness of prohibition enforcement with all its anomalies. As a boy he visited the United States with his father, who was then a British municipal tramway operator, but he remembers distinctly that at a meeting at that time at which his father spoke surprise was manifested that politics was not allowed to enter into consideration in the operation of the municipal undertaking. He is interested in the operation of the Detroit and Seattle municipal systems, and was curious to know how such operation, unusual in the United States, was working out.

He was greatly impressed with the exhibits at Cleveland, particularly the car exhibit, and he carried away with him many new thoughts on modernization. Of course, modernization is with him more an economic study than an actual problem, but he is not without economic problems, although the making of money is not one of them. His system has no securities outstanding except common, or ordinary shares, as the English say, and last year paid a dividend of 20 per cent. The operating ratio at Hongkong is much less than 50 per cent. The platform labor problem does not bother him much, but about a year ago, at the time of the Hongkong uprising, he was required to recruit a new operating force. Along these lines Mr. Bellamy said that he was following with great interest the attempts being made by Mr. Mitten to

mutualize the Philadelphia system. He expects to report personally to his board in London next year. This he does every third year.

Rail and Bus Fares Increased in Norfolk

The Norfolk, Va., City Council passed two ordinances on Oct. 26 granting the Virginia Electric & Power Company, subsidiary of Engineers Public Service Company, increases in bus and trolley fares to a 10-cent cash fare, 8½-cent ticket rate and \$1.50 weekly pass. The ordinances also provide for partial rerouting of the transportation system for the purpose of unification and improved operating economy.

Seattle Survey Report Nearly Ready

The financial survey of construction costs of the proposed project of linking the municipally owned lines of Seattle, Wash., with a system of rapid transit is now nearing completion, according to a report of the transit committee of the Seattle city planning committee. Engineers of the Seattle Municipal Street Railway are also engaged in checking figures of the original report which was compiled by the transit committee after more than a year of exhaustive research into nation-wide street railway transportation conditions. Members of the committee point out that while the plan of Superintendent of Utilities Jackson has its advantages, such as cutting down expenses in elimination of certain duplicating routes and non-profitable lines, it cannot assist in building up patronage. Superintendent Jackson's plan calls for turning cars back at Pike Street.

White Car in Joliet Urges "Safety First"

In the hope of lessening the number of street accidents, Joliet, Ill., has launched a "safety first" campaign, and is constantly operating a street car, painted white, which carries numerous safety slogans, calculated to arouse adults and children to the necessity for thinking before crossing a street, or taking any other step in which the element of danger enters. It is believed that this campaign has had excellent effect.

Cash for Suggestions on Puget Sound Property

As a result of the interest taken by employees of the Puget Sound Power & Light Company, Seattle, Wash., in the suggestion contest which closed on June 30, it has been decided again to offer prizes aggregating \$1,000 to be completed for during the period from Oct. 1, 1926, to May 1, 1927. This competition will be open to every employee.

The prizes will be awarded by a committee consisting of the vice-president, the seven district managers, the manager of the auxiliary operations, the manager of the securities company and the personnel officer. The prizes follow:

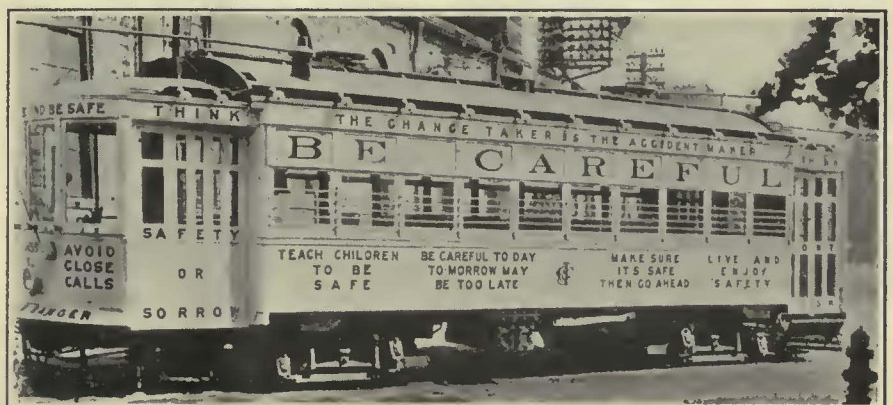
First prize	\$400 in cash
Second prize	250 in cash
Third prize	200 in cash
Fourth prize	100 in cash
Fifth prize	50 in cash

Suggestions or plans submitted are to cover subjects which are of such a practical nature that adoption by the company would probably result in an increase of gross earnings or a decrease of operating expenses, or a well-defined company policy which will clearly indicate increased efficiency throughout the organization or better relations with the public in the territory served.

City Rehabilitates Phoenix Railway

Gradually the railway system in Phoenix, Ariz., is finding itself again. The system, now under municipal control, is to be improved, both as to rolling stock and schedules, just as soon as possible. The policy of the city administration is to furnish the very best service possible commensurate with a policy of economy, according to City Manager Rieger. The system is now being operated on a 5-cent fare.

The entire property, including rolling stock, right-of-way, machinery, equipment and real estate, was purchased outright by the city from the former owners for a lump sum of \$20,000, which has been paid in full. The purchase followed appraisals made by the city and the then owners of the railway. The sale was the climax to a long, perplexing period in which no solution could be found for putting the railway, loaded down with paving and other requirements, on its feet. The problems in that city and the subsequent sale were referred to previously in the *ELECTRIC RAILWAY JOURNAL*.



Joliet's Harbinger of Safety in White Garb

Car Line to Toronto Island Favored

Although the stage has been set for some time for the taking over of the Island Ferries by the Toronto Transportation Commission, Toronto, Canada, the Board of Control is in favor of a continuation of the service furnished by Lawrence Solman until the end of the year. Meanwhile how to make the Island of Toronto, across the bay, more accessible to the people living in the city is one of the questions being debated along with radials and one-man cars. Several representatives of public affairs in Toronto have approved of an electric railway line, although there is a difference of opinion over the question of admitting buses through the construction of a proposed boulevard. It is maintained by some that the proposed extension of the Lake Shore Boulevard to the island would be too costly and that motor traffic would impair the safety and quiet of the resort. Comptroller Joseph Gibbons favors the operation of street cars if the government constructs a bridge at the channels. George Wilson, president of the Board of Trade, is of the opinion that a railway and a boulevard around the island should be constructed in the future. John O'Connor, at one time a member of the Harbor Commission, says that discontinuance of the ferry service would take away from the island one of its greatest attractions.

Rules for School Tickets at Ottawa Reiterated

To guard against the abuses which tend to rob every privilege of its value, the Ottawa Electric Railway, Ottawa, Ont., has been compelled to insist on the fundamental condition under which school tickets are issued, namely, that there be an adequate certificate to the fact that the intending passenger is a pupil at a recognized school and under fourteen years of age.

The company reminds its patrons that the person best qualified to give this certificate is the teacher at the school, but there are occasions when it is more convenient for one of the parents to call for the ticket. The company will in future accept the certificate of the parent in lieu of that of the teacher.

School tickets at Ottawa are valid only between the hours of 7 a.m. and 5 p.m. At all other times the regular fare must be paid, according to the height of the passenger.

Advantages for Employees in Insurance Plan

Co-operation between the management and the personnel of the New York Railways Corporation, known as the "Green Lines," New York, N. Y., has resulted in the adoption of a program which is expected to cover between 2,000 and 2,500 employees of the company for more than \$2,000,000 of life insurance, as well as health and non-occupational accident protection. Each employee participating in the group plan receives \$1,000 life insurance. In case of sickness from any

cause, or injury while away from work, he will receive, under the health and accident policy, a weekly benefit. These payments will start on the eighth day of disability and will continue for a maximum of thirteen consecutive weeks. The life insurance also creates a temporary fixed income for the employee himself if he becomes totally and permanently disabled before age 60. Such employee will receive the full amount of his insurance in monthly installments. During the disability period premiums will be waived by the Metropolitan Life Insurance Company, which is underwriting the group plan.

Progress on Everman Plan Made in Dallas

The Dallas Railway, Dallas, Tex., has completed practically 50 per cent of its improvement program, ordered under the Everman Plan. Started only five months ago, the work of relaying tracks, extending car lines and carrying out other improvements has already been accomplished. The improvement program, recommended by Mr. Everman, city supervisor of public utilities, calls for an expenditure of \$1,450,000.



News Notes

Fund Will Pay for Route Changes.—The United Railways & Electric Company, Baltimore, has provided a fund to pay for the construction work necessary to carry out the route changes which have been recommended by the Baltimore Traffic Survey Commission and approved by the Maryland Public Service Commission. The cost of construction work will be about \$15,000. The changes are embodied in the first group considered by the commission. Five additional groups, each involving numerous changes, are to be acted upon later.

Men Protest One-Man Cars in Montreal.—Employees of the Montreal Tramways, Montreal, Que., have registered a protest against the new one-man system and have authorized the business agent of the Montreal Tramways Employees' Union to draw upon union funds, if necessary, for a campaign in the press and elsewhere against the cars. The protest is being sent to the company.

One-Man Cars in Heart of Berkshires.—The Berkshire Street Railway began the operation of one-man cars between Pittsfield and North Adams, Mass., and north to Bennington, Vt., on Oct. 16.

Rapid Transit Over Steam Tracks Under Consideration.—The Boston Elevated Railway, Boston, Mass., is considering plans to operate a rapid transit line over the tracks of the Boston & Maine Railroad from North Cambridge to Somerville Junction. This is the present right-of-way of the Central Massachusetts branch of the Boston & Maine, which is being diverted to another route. The idea is similar to the arrangement now in use on the Shawmut branch of the New York, New

Haven & Hartford Railroad through Dorchester and Ashmont. The system suggested would operate from Somerville Junction through Somerville to connect with the main line of the Boston Elevated at Lechmere Square.

Damage to Havana Railway Negligible.—Speyer & Company, New York, have received advices from Frank Steinhart, president of the Havana Electric Railway, Havana, Cuba, that the company is again in full operation. Only negligible damage to the railway was caused by the hurricane.

\$10,000 Music Appropriation Goes for Transit.—Mayor Kendrick of Philadelphia, Pa., will get the \$10,000 he requested to engage J. Rowland Bibbins as expert in transit matters to advise him in the proposed negotiations with the Philadelphia Rapid Transit Company for a lease of the Broad Street subway. The finance committee has approved the appropriation and reported a bill to the session of Council. The \$10,000 was found nestled in an item of \$34,925 unused for music the past summer by the Park Commission. The Park Commission wanted all the money transferred to other park needs, but the finance committee appropriated the \$10,000 and let the commission have the remaining \$24,000 for uniforms, supplies and labor.

Terminable Permit Hearings to Be Resumed.—Senator Richard J. Barr, chairman, has called a meeting of the Illinois legislative terminable permit investigation committee to convene at the Palmer House, Chicago, on Nov. 8 to resume its hearings.

Grade Crossing Elimination Work to Start.—Immediate steps are to be taken by the Board of Public Works in Louisville, Ky., looking toward the elimination of grade crossings in that city. Members of the board have been in conference with Mayor Will discussing plans for speeding up this work. Edward J. Miller, chairman of the board, said that the board was becoming impatient at the long delay in action on the part of those who are blocking the work. Disagreement over rerouting of cars of the Louisville Railway has been partly responsible for the delay.

Course in Traffic Management.—A course in "Traffic Management" has been started by the Pacific Electric Railway, Los Angeles, Cal., under the tutorship of E. W. Hill, educational director. Each Wednesday from 7 to 9 p.m. a limited number of employees will learn the principal phases of traffic management, including classification, tariffs, rates and claims, with the practical side expressed by the men engaged in that work. As planned the course will run to June next.

New Edition of Boston Guide Book.—A new edition of the familiar and useful Guide and Information Book, issued originally in 1924, is being prepared by the Boston Elevated Railway, Boston, Mass. The general plan of the new edition is the same as that of the old one, but the cover and maps are in colors. The use of different colors for the several kinds of transportation lines will make it easier for employees to explain to patrons how to get from place to place.

Would Cancel Franchise.—The Buffalo City Council has voted to revoke the franchise of the International Railway, Buffalo, N. Y., for the operation of cars in Grant Street between Hampshire Street and Military Road, a distance of almost 2 miles. The resolution for revocation of the franchise was introduced by Mayor Schwab because of the alleged failure of the company to repair its tracks and roadbed in the street as ordered by the Public Service Commission. The company questioned the authority of the state utilities board to issue such an order and now the International is questioning the authority of the City Council to revoke its franchise in the street. The legal department of the company indicated it would apply to the courts for an injunction if the city makes any attempt to remove the tracks. The city already has authorized contractors to start repaving the street. The present move is in effect merely another attempt by the Mayor to embarrass the company.

What Leaders Think of Georgia.—"A Welcome Awaits You in Georgia" is the assurance given by the Georgia Railway & Power Company, Atlanta, Ga., in a 60-page pamphlet expository of the public sentiment in Georgia toward new industries and citizens as expressed by business and industrial leaders, newspaper editors, public officials and others.

One-Man Cars Under Fire in Toronto.—Agitation is prevalent in Toronto, Ont., against one-man car operation, but D. W. Harvey, general manager of the Toronto Transportation Commission, says if one-man cars are not run fares must be increased to give a service similar to that now in effect. On the other hand, if service had to be reduced, as it would under two-man operation, there would be a corresponding decrease in revenue. He says that safer and more convenient service can be rendered with one-man cars than with two-man cars and that several recent fatalities with one-man cars were not indicative of their being dangerous to operate. Following his report, however, operators recited dangers encountered during rush hours. Members of the local division of the Amalgamated reiterated their opposition to the one-man car and executives were instructed to act to protect the interests of the men.

Starts Eight-Car Trains on Another Branch.—Eight-car train service, replacing four and six-car local expresses, during the rush hours on the Lake Street division of the Chicago Rapid Transit Company, Chicago, Ill., was started on Oct. 1. The change as effected will give residents of the adjacent communities of Austin and Oak Park faster elevated service than they have had since the line opened in 1893. The new service is a part of a program of speeding up on the entire Rapid Transit system, the longer train operation having been made possible by reason of the platform extension work which has been under way for several months. The first eight-car trains of the Rapid Transit Lines were placed in operation on the Evanston-Jackson Park division early last spring.

Foreign News

London Bus Restriction Held Invalid

By a vote of two to one the Ealing Bench of Magistrates, London, England, recently dismissed a summons against an independent bus owner for alleged failure to comply with the restrictions on operation along Uxbridge Road between Shepherd's Bush and Uxbridge. An account of the promulgation of these regulations by the Minister of Transport acting under powers conferred by the London traffic act of 1924 was published in *ELECTRIC RAILWAY JOURNAL* for April 10. The defendant acquired a bus in March, 1925, and was assigned to this route by the Ministry of Transport. Later, he was excluded by the new regulations. He admitted, however, that before commencing operation he had been warned that such an outcome was likely. Counsel for this operator, however, contended that the Minister of Transport had exceeded his authority in attempting to enforce these rules. The regulations, he said, were unreasonable, unjust and involved a gratuitous interference with the rights of citizens. After a short consultation, the magistrates announced their decision dismissing the summons. It is expected that an appeal will be made against the decision. Meanwhile, the independent bus owners have decided to continue operation of full service between Uxbridge and Shepherd's Bush.

Rome to Have Subway

Construction of 27 miles of subway lines will soon be under way in Rome. A commission appointed by the Italian government has just completed the plans, after a thorough tour by it of the city in order that archaeological ruins may be conserved for future generations. The first unit of this underground project will be completed within the next ten years. The two principal lines will cross each other at the Piazza Santi Apostoli, the first one running in an east-westerly direction from the railway station quarter of the city to the Prati and the St. Peter Square and the other one from the Via Flaminia to San Paolo, the starting point of the electric railway to Ostia. In the future a line to cover the south of Rome will start from St. Peter Square to Janiculus and Trastevere, crossing River Tiber at the Sublicius bridge and extending by way of San Paolo, the Square of Laterans and the Porta Maggiore to San Lorenzo and the Cemetery.

Electrification in Switzerland Progresses

Operation of the new electric road connecting the four Swiss cities Basle, Brugg, Baden and Zurich will begin in November. The time for the express trains between Basle and Zurich will be reduced by eighteen minutes and

that of local trains by 29 minutes as a result of the change from steam to electricity.

Approximately one-third of the Swiss railroad system is now electrified, or 590 miles out of a total of 1,828 miles. This is following out a still more extensive program which has been discussed in earlier issues of this paper. One of the chief factors for transition of systems is shown in the following table of increase in traffic during the last few years:

	Freight, Metric Tons	Passengers Carried
1925.....	16,436,630	101,827,814
1924.....	16,599,201	96,486,306
1920.....	15,829,742	86,080,314
1913.....	14,614,781	91,649,336

Railroad Electrification Work in Austria Progressing

Progress is being made with the electrification of the Austrian Federal Railways. Freight trains at the present time travel at a speed of 20 m.p.h., compared with 9½ miles in the era of steam transport. Great acceleration of traffic has also been accomplished in the case of passenger trains, although electricity has not yet been fully used owing to the short lengths of the lines which so far have been electrified. The Innsbrück-Bludenz line, for example, is only 85 miles long and the changing of locomotives causes a considerable loss of time. The lines that are now being constructed are Salzburg-Worgl, Kufstein-Worgl and Innsbrück-Brenner, which measure a total of nearly 190 miles (double track), with the exception of the single track Kufstein-Worgl line (9 miles). Current is supplied to these lines by the Mallnitz and Stubach electrical power stations. Some 47 electric locomotives have so far been ordered, all from Austrian firms.

Railway Progress in India.—The Great Indian Peninsula Railway has completed its harbor branch from Victoria Terminus to Thana. Progress is reported, too, on the main line running between Sandhurst Road and Kalyan, which will be completed by the end of next year. It will provide through electric service from Victoria Terminus to Kalyan. The plans as outlined provide for electrification of this line as far as Poona by 1929 and to Igatapuri in 1930.

Manchester's Anniversary Shows Many Improvements.—Since the first electric car ran in Manchester, 25 years ago, there have been put into service 903 cars and 58 buses. To house 230 of these cars the City Council is erecting a new shed which will cover 4½ acres and is estimated to cost £170,000. During the last six years an increase of 38 miles of track has been made to the 212 miles of the tramway system.

Shops for Liverpool.—Liverpool City Council is now constructing tramway repair shops at a cost of £385,000 to occupy 9 acres.

Recent Bus Developments

Steam and Electric Road Opposed

Proposal of Railroads in Pennsylvania to Run Buses in Electric Railway Territory Brings Protest

Powell Evans, president of the Schuylkill Railway and the Schuylkill Transportation Company, Girardville, Pa., published a statement on Oct. 20 in opposition to the plans of the Pennsylvania Railroad and the Reading Company for establishing bus service in 55 and 24 counties, respectively. Besides putting out of business existing transit and bus lines, Mr. Evans points out, the railroads will probably increase their rates.

According to Mr. Evans steam railroads in Pennsylvania are prohibited by state laws from operating directly or indirectly either passenger or freight service over the public highways. He says that if the Pennsylvania Railroad and the Reading Company are permitted to carry out their programs for operating bus lines in a large number of counties in the state, the result will be the absorption by the steam lines, on their own terms and values, of virtually all competing local and bus transport throughout the state.

Mr. Evans' statement may be regarded as a spirited reply to a statement issued about a week ago by the Reading Company in an attempt to justify its ambition to run buses. Governor Pinchot recently refused to approve charters giving subsidiaries of the Reading Company and the Pennsylvania Railroad the right to operate buses on the state's public highways. In reply to this, the Reading Company declared that the railroads had just as much right as any one else to use these roads, inasmuch as they, the railroads, contributed to the support of the highways. In the meantime, the Reading Company is proceeding serenely with its plans for bus operation, apparently awaiting the day when Governor Pinchot shall have passed out of office.

In explaining the trolley and bus situation in Schuylkill County in particular, and throughout the state in general, Mr. Evans stated that the Schuylkill Company has experienced since the war a constant shrinkage in receipts and a constant increase in expense caused by automobile use and "below-cost railroad competition" from the steam railroads. The Schuylkill Company, he says, was established in 1892 and operates about 50 miles of trolley and bus routes through the upper two-thirds of Schuylkill County and serves about 180,000 population from Pottsville north. Its total capital is \$2,500,000, or less than the appraisal accepted by the Public Service Commission for a rate basis, and it is almost entirely owned by residents of Philadelphia and eastern Pennsylvania, who receive barely 3 per cent per annum on their investment in the property. He declares that the trolley and bus

lines both pay their full share of taxes and their security holders are as fully entitled to protection and support in their rights and investments as are those of the steam lines. Further Mr. Evans said:

The steam lines are prohibited by Pennsylvania laws from operating directly or indirectly either passenger or freight service over the public highways, while to the contrary trolley lines are expressly empowered to do both. The Public Service Commission by its actions and decisions throughout its existence has consistently prevented unnecessary duplication of public service facilities and protected those it regulates from destructive competition; and the steam lines themselves have protested against such duplication in their own field, as witness the present fight against the proposed new Harriman steam line across this state, and their constant opposition to all bus applications.

In the next paragraph Mr. Evans calls attention to the fact that the Schuylkill Company in 1922 organized the Schuylkill Transportation Company as a bus subsidiary, and that the two companies have continuously provided throughout their community economic and efficient unified trolley and bus service of high quality and at reasonable rates. In fact, Mr. Evans adds, they have assisted the Reading Company upon request.

Finally, Mr. Evans says that the Schuylkill Company and generally the trolley and bus companies throughout the state "propose to resist to the utmost the unjustifiable aggression initiated by the steam lines against established, responsible and equally legitimate local competitors."

Councilmen Oppose Buffalo Bus Project

The City Council of Buffalo, N. Y., has failed to approve Mayor Schwab's plan for the extension of municipal bus lines. The commissioners indicated they would not vote for the expenditure of additional funds until the Mayor supplied detailed information regarding the costs and the terms of agreements he had proposed to make with various automobile companies and bus corporations.

The only information contained in the Mayor's municipal bus resolution called for the purchase of passenger buses from the Reo Motor Car Company at \$5,525 each, buses from the White Motor Car Company at \$10,887 each and also buses from the Dodge Company at \$4,337 each. The contracts were to be somewhat similar to the Detroit rental-sale plan. The city was to pay the companies at the rate of 20 cents per bus-mile and guarantee each bus 100 miles a day, this sum to apply on the purchase price. In addition the city was to furnish gasoline and oil, pay for the driver and supply fire, theft and liability insurance.

A conspicuous opponent of the municipal bus plan was Commissioner Frank C. Perkins, the Socialist member of the Buffalo City Council, who for years has been advocating municipal ownership of all utilities.

Shore Line Would Purchase Calumet Coach Company

Permission for the purchase of the Calumet Motor Coach Company by the Shore Line Motor Coach Company, a subsidiary of the Chicago, South Shore & South Bend Railroad, is asked in a petition filed recently with the Indiana Public Service Commission by the railway subsidiary. The petition states that the coach lines operated by the two companies are in close proximity in the Calumet district and that "the interchange of traffic is such that public convenience will be served better if the operation of the routes is carried on by a single company." The purchase will make the Shore Line company one of the largest coach companies operating both interurban and city coaches in that section of the country. A total of 23 routes will be operated out of Gary, to Chicago and Grand Rapids, the northern terminus.

The capital stock of the Calumet Motor Coach Company was purchased last July from its former owners by the Midland Utilities Company, an investment company interested in other utilities in the district served. It holds a franchise to furnish motor coach transportation in Hammond. The Calumet company also operates two routes from Hammond, Ind., to Chicago. The Shore Line company operates through service connecting Chicago and Benton Harbor and Grand Rapids, Mich., also connecting Chicago and Gary and Valparaiso, Hammond and Chicago Heights and other northern Indiana points. The company has its headquarters at Gary. Both lines also operate an extensive chartered car service.

There will be no change in the personnel of the present Calumet company.

Combined figures of the unified coach company will show the following totals: 125 coaches, five garages, 318 employees, nearly 15,000 coach-miles operated daily, with approximately 25,000 passengers carried daily.

The petition also asks the right to issue no par value common stock to cover the cost of the motor coaches and equipment purchased by the Shore Line company. In a separate petition filed jointly by the Gary Railways and the Chicago, South Shore & South Bend Railroad, each of which already owns approximately half of the issued stock of the Shore Line Motor Coach Company, the two railroads ask the right to purchase equal portions of the new stock to be issued by the Shore Line Motor Coach Company.

The Place of the Bus Defined

Buses never will supplant street cars for mass transportation in St. Louis or any other city, in the opinion of the special committee on subways of the Board of Aldermen of St. Louis, which has been rendering all-embracing views upon subjects related to rapid transit for St. Louis, after a study of conditions in many large cities of the United States. In general the committee finds:

The consensus of opinion seems to indicate that there is no place in any city, except possibly the few very largest cities,

for the bus in competition with street railways, because such competition inevitably renders adequate service by the railway impossible, if it does not actually ruin it, while after the ruin takes place the bus cannot handle the load, particularly during the rush-hour peak. Competition might, however, be justified where the street railway is backward and will not keep up with modern developments.

There is a sociological question involved in the difference between a 7-cent car fare and a 10-cent bus fare. The difference between these two rates means an average increase for transportation of about \$50 a year a family. No doubt in any community 5 or 10 per cent of the families can easily absorb such increase, but the great multitude of the families cannot contemplate or undertake with equanimity an increase of \$50 in the family budget; to avoid that the cheaper means of mass transportation by street cars in the larger cities must be continued in full vigor and at the least cost. This cannot be done if they be subjected to unregulated competition of favored, subsidized motorbus lines.

The extent to which buses in St. Louis have been favored and subsidized is indicated by the fact that they are permitted to charge a 10-cent fare while the railways are limited to a 7-cent fare; the railway company contributes to the city about 12 per cent of its gross revenues in various forms of taxation and paving costs, the bus company approximately 4 per cent; the bus company is not compelled to provide any particular quantity of service during the rush hours, but is permitted to choose the number of passengers for which it is willing to provide seats; the railway is compelled to provide a fixed number of seats and a fixed area of standing room for all the passengers and carries the burden; the buses wear out pavements provided by others; the railway pays for pavements used by others. There is no obligation on the bus company to continue service on any line.

Bus Must Prove Its Right to Exclusive New York Street

The Park Avenue Association of New York City has announced the appointment of the engineering firm of Fisk & Roberts, New York, to report on bus operation proposed on Park Avenue by the Board of Transportation. This association, on behalf of its members, has consistently opposed the granting of a franchise for a bus route on Park Avenue and has now retained its own experts to analyze the advantages and disadvantages of the city's plan for a route between 45th and 96th Streets on Park Avenue.

Terminal Urged for Manhattan

The building of a terminal for interurban buses in New York City, many of which are now run into the Times Square area, to lessen street congestion, was urged on Sept. 19 by the Forty-second Street Property Owners and Merchants Association. According to a survey made of mid-town Manhattan there are about 50 interurban bus companies sending between 500 and 600 buses daily into the Times Square area and out of it.

The study revealed the fact that throughout the day there is generally a minimum of 50 buses standing still in the streets. At certain hours the number reaches to almost 100.

Edwin W. Forrest, secretary of the Forty-second Street Property Owners and Merchants Association, said that the interurban bus had developed to the point where, unless it were controlled, preferably by the bus companies, it would interfere with other interests, which would not be slow to object.

Football Followers Handled by Buses in Bethlehem

Roomy buses are being used at Bethlehem, Pa., to meet the need of congested traffic and suddenly mobilized crowds of passengers. Bethlehem is an old city with narrow streets. Its planners evidently missed the fact that future years were to bring an amazing volume of automobile and trolley travel. It happens also that Bethlehem is the seat of Lehigh University and is a collegiate and scholastic sports center of considerable renown.

Bethlehem is served by the Lehigh Valley Transit Company, which covers with its lines a great area in eastern Pennsylvania. When a hill-to-hill bridge was completed last year, with its spans extending octopus-like in five directions to touch important sections, the railway, lacking permission to lay tracks, organized the Lehigh Valley Transportation Company as a subsidiary and established a fleet of ten buses.

With the coming of the football season it was found that terrific congestion occurred every Saturday and Sunday afternoon between the hours of 1 and 6 p.m. Lehigh University stadium attracts its thousands, the Bethlehem High School field is the Mecca for additional thousands and professional Sunday football, played on the Bethlehem Fabricator field, in a somewhat isolated section of the city, and several blocks removed from the nearest trolley line, has many followers.

The Lehigh Valley Transit Company officials met with the executives of Bethlehem and offered a plan of running buses in place of trolleys during these rush periods. It met with instant approval. The Public Service Commission agreed to the proposal. As a result ten buses now serve the passengers whenever an event of any magnitude is held. They are diverted from the hill-to-hill bridge runs for the extensions to the playing fields, during periods when the crowds are going to the fields and returning. Traffic congestion is in consequence tremendously relieved. Patronage is always at capacity. When the main crowds have been taken care of the buses are returned to their usual runs. The ten routes are designed to cover every important part of the city.

Bus Service Arranged for Vancouver, Wash.

Bus service in Vancouver, Wash., will be operated by T. L. Lineham and associates, who have been granted an exclusive franchise by the City Council. A 30-minute schedule will be maintained. The fare will be 10 cents for adults, 5 cents for children under seven and 5 cents for school children on school days. The fare from any section of Vancouver to Portland by bus and street car will be 25 cents and by stage to Portland 30 cents.

Following favorable action by the State Department of Public Works on a petition of the Clark County Development Company to discontinue railway service between Vancouver and Sifton, the cars have been taken off this run. The order releasing the company has

been signed by the Clarke County Commissioners. The franchises canceled were granted the Vancouver Traction Company on Jan. 15, 1909, and taken over by the present company on Feb. 15 of the same year. Service will be continued in the city until bus lines are established.

Both Companies at Lincoln Get Permits

The City Council of Lincoln, Neb., has voted to give each of its railways, the Lincoln Traction Company and the Omaha, Lincoln & Beatrice Railway, an interurban, what it wants. The interurban made the first request, which included a loop that kept it within its old downtown business section boundaries. Later it amended this, at the request of business men, to make a wider detour, entering what the traction company officials say is the cream of its territory. The traction company then asked for permission to run bus lines into the suburb of University Place, which has just been taken into the city, and which is the starting point of the interurban buses. The interurban protested against this, saying it had not sought to invade traction territory, and the traction company replied with a challenge of this statement. The interurban has buses on the ground and started them, after permission had been granted, but without changing the downtown routing. The traction company received the permit and will have its buses in operation soon.

New Service to Picturesque Poconos

A drastic change will be made on Nov. 1 in the operation of one of the most unusual railways in the United States. This is the line run by its employees, who leased it a year ago from the Bangor-Nazareth Transit Company.

The road extends from Pen Argyl to Nazareth, passing through Wind Gap. It caters mostly to passengers who make short trips to the resorts in that section during the summer. The most notable of these places is Saylor's Lake, near Delaware Water Gap and the Poconos.

The employees now intend to discard the three trolley cars remaining in service and will install a bus line. Two buses have already been received for operation over the splendid cement highways spread over the entire region. Service will also be instituted to Bangor. The bus line will make connections with the Lehigh Valley Transit lines at Nazareth and transport passengers into the Pocono foothills on hourly service.

Bus Field Left to Railway

The petition filed with the Public Service Commission of New York by the County Transportation Company, Inc., for permission to operate bus lines in White Plains, the villages of Scarsdale, Elmsford and Tarrytown and the town of Greenburgh, Westchester County, has been withdrawn by the petitioner and the records closed with the commission.

This company obtained local consents in all municipalities except in the village of Elmsford. Consents of the city of White Plains and the village of Scarsdale were not to become operative unless consents were obtained from all other municipalities and operation commenced within 60 days and in the village of Tarrytown within 30 days.

The proposed route would follow the line of the Westchester Street Railroad, and the application was opposed by the receiver of that company. Subsequently this line was acquired by the Union Railway, which also opposed the petition. Several hearings were held and on Sept. 15 the attorney for the petitioner withdrew the application.

Buses Into the Saucon Valley

A bus line may replace the trolley service of the Bethlehem Transit Company, South Bethlehem, Pa., across the Lehigh mountains and into the Saucon Valley. This particular branch of the Bethlehem Transit Company lines serves a widely scattered community, in which traffic at certain times is almost nil, so that the possibility of running trolleys on a faster schedule or providing better service by car are discounted. Private individuals are seeking permits from the Public Service Commission to serve this territory, but the Bethlehem Transit Company will doubtless file a petition of its own.

Weekly Passes on Lordship Bus Routes

The Connecticut Public Utilities Commission has granted permission to the Lordship Railway to institute a system of weekly passes on its bus route between Lordship and the Plaza, Bridgeport, with the limitation that the weekly passes will be issued for a trial period of one year. The finding of the Public Utilities Commission allows the company to issue weekly passes at \$1 each for use on the bus route between the Plaza at Bridgeport and Lordship or Avon Park in Stratford, and passes at 50 cents for use between Hollister Bridge and Lordship or Avon Park. The new system will go into effect Nov. 1.

The Lordship Railway operates a bus line from the Plaza, Bridgeport, to Lordship in Stratford, or Avon Park in Stratford, a round trip to either point covering a distance short of 9 miles.

Would Consider Bus Request.—The Milwaukee Electric Railway & Light Company has taken under advisement the request of the West Racine, Wis., Business Men's Association asking for the extension of the railway's bus system to serve West Racine, a rapidly developing suburb now without any form of transportation service. The proposed line would also touch Mygatt's Corners, where 115 families have signed a petition signifying their intention to support bus service.

Service Increased in Evansville.—Bus service in Evansville, Ind., supplied by the Southern Indiana Gas & Electric Company for the past six months, has met with considerable success, so that

the company has put on four new buses to connect with the city cars in remote sections of the city. The new buses have a capacity of about 35. They will not be assigned to any particular routes, but will be used to handle peak crowds.

Lines Extended Into New Territory.

—Two suburban bus lines have been extended into growing residence districts by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. The bus line which operates as a feeder to the Third Street line at the end of Green Bay Avenue now operates $\frac{3}{4}$ mile beyond its former terminal. Under the new plan buses will operate until midnight instead of discontinuing service at 10 p.m. The Clement Avenue bus line, a feeder to the Oakland-Delaware line, has been extended from its former terminal at the Nash Motor plant to St. Francis and Second Avenues in St. Francis. The new areas served are sparsely settled.

Bus Line Planned.—The Gardner-Templeton Street Railway, East Templeton, Mass., is being discontinued and the directors have sold the rails and wire to a Gardner junk dealer. The management will put on a bus service to replace the trolleys.

Specific Stopping Places for Boston Buses Wanted.—Edward Dana, general manager of the Boston Elevated Railway, Boston, Mass., is seeking a revision of the city traffic regulations to designate specific stopping places for buses operated by the company. At a recent conference with the Boston Street Commissioners, Mr. Dana suggested that buses should be provided with certain exclusive stopping points for the convenience of patrons. At the present time there are points where it is almost impossible for the buses to take on passengers because of private autos parked in the way. It has been necessary for the buses to stop in the midst of moving traffic to allow patrons to alight.

New Bus Fare in Effect.—The fare on the Riverside Drive bus line of the Los Angeles Motor Bus Company, Los Angeles, Cal., was made 6 cents without transfer privileges, effective on Oct. 7. The former fare of 10 cents with transfer privileges to and from the Los Angeles Railway and Pacific Electric Railway lines remains the same.

Purchases Jitney Lines.—President W. Scott Eames of the New Haven & Shore Line Railway, Guilford, Conn., has announced the purchase of the operating rights of the Waterbury Jitneys & Taxis, Inc., operating a bus line between New Haven and Saybrook. The additional line will be absorbed in the regular operating schedule of the Shore Line. The New Haven & Shore Line Railway operates 37 miles of line.

Would Investigate Interurban Bus Status.—The St. Louis, Mo., Board of Public Service has instructed Director of Streets and Sewers Brooks to investigate the status of interurban bus lines now using the streets of the city. Numerous complaints have been made that many bus lines are operating without city permits. A city ordinance requires all bus lines to obtain city per-

mits which specify what streets they may use. When this ordinance was originally passed seventeen bus line permits were taken out, the majority for the People's Motorbus Company. Several permits have been issued since that time, but many bus companies have come into the city without making an attempt to comply with the ordinance.

New Bus Service Started.—The Hamburg Railway has started the operation of five de luxe passenger buses between Buffalo and Hamburg, N. Y., under a certificate of convenience and necessity granted by the Public Service Commission. This is the first of three bus lines to be started by the Hamburg Railway between Buffalo and suburban points in western New York and is known as route A-1. Motor coaches will operate on an hourly schedule. No local passengers will be carried in the city of Buffalo. The buses have a capacity of 29 passengers. The round trip is 75 cents, with a one-way fare of 40 cents. Commutation books will be sold on a basis of 30 cents a trip.

Bus Routes Authorized.—The Scranton Bus Company, a subsidiary of the Scranton Railway, Scranton, Pa., has received a certificate from the Public Service Commission to operate buses from Dunmore Corners through Green Ridge Street to Providence Square. This is a crosstown bus line serving citizens of Dunmore and north Scranton. A certificate has also been secured to extend the bus line now operating from the Throop Boulevard section to the center of the city, through Wyoming Avenue to Lackawanna Avenue.

Prohibits Restraining Orders Against Independents.—A writ to prohibit Judge William Kittinger of the Circuit Court at Anderson, Ind., from issuing restraining orders, injunctions or contempt of court citations against four independent bus operators in Muncie, Ind., has been issued by Judge David A. Myers, chief justice of the Indiana Supreme Court. The petition follows a controversy between Arthur W. Brady, receiver for the Union Traction Company, and the Muncie bus operators. The traction officials asserted that the Muncie operators are running illegally. Attorneys for the bus men declare they carried the matter to the Supreme Court because they feel that court action should be in Delaware County, where the buses are operating, and not in Madison County, where the receivership was established.

Extension of Service by Buses.—The Northampton Street Railway, Northampton, Mass., has been granted authority by the towns and cities involved to run buses between Northampton and Williamsburg. Between Leeds and Williamsburg buses will be operated entirely and the trolley service will be abandoned. Between Leeds and Northampton buses will be used to cooperate with the railway service. The Aldermen of Northampton granted licenses after some dispute regarding the fare. The licenses issued also include an order for a reduction in fare between Northampton and Williamsburg as offered some time ago by the Northampton Street Railway.

Financial and Corporate

Interborough Gross and Net Up

Increase in Net Corporate Income for Year Ended June 30 Was \$2,278,253 —Earnings Statements Compared

Gross operating revenue of the Interborough Rapid Transit Company, New York, for the year ended June 30, 1926, was \$61,708,815, compared with \$58,418,991 last year, a gain of \$3,289,824, or 5.63 per cent, the result of a gain on the subway division of \$3,213,036, or 8.15 per cent, and a loss on the Manhattan Railway division of \$76,788, or 0.40 per cent. The gain in the revenue from the transportation of passengers was \$2,047,021 and the gain in the other street railway operating revenue \$1,242,803, principally from ad-

year, or an increase of \$2,786,203, or 12.64 per cent, the result of a gain on the subway division of \$2,476,446, or 14.55 per cent, and a gain on the Manhattan Railway division of \$309,757, or 6.17 per cent.

Non-operating income was \$276,979, as against \$292,200 last year, a decrease of \$15,221, or 5.21 per cent, the result of a decrease on the subway division of \$21,573, or 10.10 per cent, and an increase on the Manhattan Railway division of \$6,352, or 8.08 per cent.

Gross income was \$25,094,198, compared with \$22,323,216 last year, an increase of \$2,770,982, or 12.41 per cent, the result of a gain on the subway division of \$2,454,873, or 14.25 per cent, and a gain on the Manhattan Railway division of \$316,109, or 6.20 per cent.

Income deductions were \$21,669,158,

city and the related certificates, balance of cost of 150 additional subway motor cars and additional shop and power facilities to provide for operation of additional subway cars.

The comparative income account for the years ended June 30, 1926, and 1925, is contained in the accompanying table.

The system is made up of 378 miles, of which 237 is elevated lines and 141 subway.

Michigan Road to Discontinue After Foreclosure

The Grand Rapids, Holland & Chicago Railway went under the hammer before Judge Clarence W. Sessions in United States District Court at Grand Rapids, Mich., on Oct. 20, with the Hyman-Michaels Company, Chicago, the successful bidder. Its offer of \$227,500 for the entire road and equipment was accepted when no other bids were made.

The railway went into the hands of receivers in June, 1924, on petition of the Continental & Commercial Trust & Savings Bank, Chicago, the trustee under a deed securing \$1,500,000 of Grand Rapids, Holland & Lake Michigan Railway first mortgage 7 per cent bonds (extended) on which interest was defaulted on Feb. 1, 1924. The Grand Rapids, Holland & Chicago Railway was incorporated on July 19, 1904, as successor to the Grand Rapids, Holland & Lake Michigan Railway. It owns 76 miles of track. In 1916 the road was leased to the Michigan Railroad for five years. This lease was renewed for another five years at its expiration, but on Jan. 1, 1924, the lease was canceled and the road returned to the owners.

The sale is, of course, subject to the approval of the court. Meanwhile service will be continued, but the prospect is that after the successful bidder is fully qualified and title passes the road will discontinue.

New Kansas City Mortgages Filed for Record

The Kansas City Public Service Company, new owner of the railway at Kansas City, Mo., has filed a mortgage under which bonds will be issued in an initial amount of \$12,465,200. The mortgage is on the properties of the defunct Kansas City Railways, title to which has been transferred to the new company and is of the type that may be enlarged at intervals as the need may arise.

The new owners of the property will distribute a total of \$11,150,755 of the bonds among themselves. The remaining bonds of the new issue, having a total face value of \$1,314,444, will be remitted to the group of personal injury claimants, for whom Senator James A. Reed arranged a settlement with the federal court at the time of the receivership litigation.

The issue of bonds is being arranged on the basis of a 30-year maturity, but they will be recalled and exchanged for eighteen-year bonds in the event the franchise extension fails if a public referendum is held.

Also on Oct. 18 a similar mortgage on the Wyandotte Railways, a subsid-

COMPARATIVE INCOME ACCOUNT OF INTERBOROUGH RAPID TRANSIT COMPANY

Year Ended June 30	1926	1925	Increase
Gross operating revenue	\$61,708,814	\$58,418,990	\$3,289,823
Operating expenses†	33,540,812	33,088,385	452,427
Net operating revenue	\$28,168,001	\$25,330,605	\$2,837,396
Taxes	3,350,782	3,299,589	51,193
Income from operation	\$24,817,218	\$22,031,015	\$2,786,203
Non-operating income	276,979	292,200	15,220
Gross income	\$25,094,198	\$22,323,216	\$2,770,982
Income deductions	21,669,158	21,176,428	492,729
Net corporate income	\$3,425,040	\$1,146,787	\$2,278,252
Add:			
Surplus at beginning of year	\$1,529,863	\$391,534	\$1,138,329
Profit and loss account—Net changes during the year	13,865	8,457	22,322
Totals	\$1,543,728	\$383,076	\$1,160,652
*Surplus at end of year†	\$4,968,768	1,529,863	\$3,438,905

*Stated exclusive of accruals under Contract No. 3 and related certificates payable from future earnings but with full deduction for sinking fund on first and refunding mortgage bonds, the payment of which is under the "Plan of Readjustment," postponed for five years from July 1, 1921, provided an amount equal to such postponed sinking fund be expended for additions or improvements to the property.

†Stated exclusive of expenditures for maintenance in excess of contractual provisions.

vertising, which shows an increase of \$1,227,328 over the previous year.

Operating expenses with maintenance and depreciation included on the basis of contractual provisions were \$33,540,813, compared with \$33,088,385 last year, an increase of \$452,428, or 1.37 per cent, the result of an increase of \$656,713, or 3.04 per cent, on the subway division and a decrease of \$204,285, or 1.77 per cent, on the Manhattan Railway division.

The net operating revenue was \$28,168,002, compared with \$25,330,606 last year, an increase of \$2,837,396, or 11.20 per cent, the result of a gain on the subway division of \$2,556,323, or 14.32 per cent, and a gain on the Manhattan Railway Division of \$281,073, or 3.76 per cent.

The total amount of taxes was \$3,350,783, compared with \$3,299,590 last year, an increase of \$51,193, or 1.55 per cent; the subway division shows an increase of \$79,877, or 9.56 per cent, while the Manhattan Railway division shows a decrease of \$28,684, or 1.16 per cent.

Income from operation was \$24,817,219, compared with \$22,031,016 last

year, compared with \$21,176,429 last year, an increase of \$492,729, or 2.32 per cent.

The net corporate income was \$3,425,040, compared with \$1,146,787 last year, an increase of \$2,278,253.

Some \$10,899,889 was spent during the year for maintaining the railroads, power plants and the rolling stock in good operating condition. This amount was \$981,346 in excess of the contractual provisions and when deducted from the net corporate income leaves a balance for the year of \$2,443,695, compared with a deficit the previous year of \$345,508.

The number of passengers carried was 1,130,484,647, compared with 1,089,544,225 last year, an increase of 40,940,422, or 3.76 per cent, the result of a gain on the subway division of 47,459,401, or 6.44 per cent, and a loss on the Manhattan Railway division of 6,518,979, or 1.85 per cent.

A net expenditure of \$3,087,693 was made during the year for additions, betterments and replacements. This amount includes the company's contribution toward construction and equipment under Contract No. 3 with the

ary operating in Kansas City, Kan., was filed there. The mortgage, which will be held by the Kansas City Public Service Company, provides for a bond issue of \$1,750,000 face value on the Wyandotte County properties of the company. Thus the initial bond issue of the Kansas City Public Service Company represents a total face value of \$14,215,200, secured by pledge of both the Kansas and Missouri properties.

Shall the Purchased Franchise Be Included in Property Value?

A hearing was held on Oct. 5 before the Court of Appeals of the District of Columbia in the case of the Public Utilities Commission against the Capital Traction Company, Washington, D. C. The case is on appeal from the decree of the Supreme Court of the District of Columbia fixing the fair value of the properties of the Capital Traction Company for rate determination purposes. F. H. Stephens appeared for the commission and George E. Hamilton and G. Thomas Dunlop for the railway.

An agreed statement of facts shows that the commission, after hearings made in 1919, found the value of the company's property as of 1914, and added thereto the cost of property acquired between that date and the date of valuation in 1919. This was conceded to be an error and the Supreme Court of the District of Columbia, having the entire record, revalued the property as of Jan. 1, 1925. On that date the court found the fair value to be \$30,906,880, which included \$5,150,000, the cost of franchise and other intangible elements.

The commission brought this appeal from the decree of the Supreme Court of District of Columbia, asking that the decree should be reversed and remanded with instructions to the court to eliminate the item of \$5,150,000. The commission also sought consideration of historical cost or investment value and proper depreciation.

Counsel for the Capital Traction Company contended that the actual cost of the franchises and other intangible elements of value purchased from the Washington & Georgetown Railroad should be added to the reproduction cost new, as such actual expenditure was legal and necessary, and the stockholders had relied upon protection of such value. They contended, further, that there should be no allowance for depreciation as the sinking fund is adequate to care for it.

Year's Balance in Detroit Increases

The railway operating revenue of the city of Detroit Department of Street Railways, Detroit, Mich., for the year ended Sept. 30, 1926, was \$23,064,009, against \$21,736,795 for the year ended Sept. 30, 1925. The coach operating revenue for these two periods was \$1,742,686 and \$498,384 respectively. Railway operating expenses was \$17,406,793, against \$15,832,833 for the 1925 period. Coach operating expenses were \$1,720,988 for this year, against \$486,624 for 1925. The net revenue from all sources was \$5,935,286 for the

year ended Sept. 30, 1926, and \$6,088,089 for the similar period in 1925.

After the consideration of deductions the net income was \$3,249,252 for this year, against \$3,462,897 last year. The balance for this year's period was \$634,328 and for last year \$531,285.

The total number of railway passengers for the year ended Sept. 30, 1926, was 495,946,976, against 465,694,211 passengers for the year ended Sept. 30, 1925. The total number of coach passengers was 22,569,423, against 6,811,112 in 1925. The report showed railway revenue car-miles to be 54,870,968, against 50,482,115 in 1925, and the coach revenue miles 7,503,988, against 2,056,587 in 1925.

Traffic on Decline in St. Louis

The United Railways, St. Louis, Mo., during the quarter ended Sept. 30 carried about 5,500 fewer passengers daily than in a similar period last year, according to a report filed with the City Register by Receiver Rolla Wells. It is revealed that during the quarter the company carried 61,989,925 cash passengers, compared with 62,097,861 for the similar month in 1925. In the quarter for which the report has just been filed the company operated on weekdays, except Saturdays, 1,308 cars, on Saturdays 1,104 cars and on Sundays 638. Last year 1,301 cars were used on weekdays, 1,091 cars on Saturdays and 612 cars on Sundays.

The reduction in traffic probably would have been much more pronounced but for the Greater St. Louis Exposition held in Forest Park during the last quarter and the little world's series baseball games between the St. Louis

Cardinals and the Pittsburgh Pirates at Sportsman's Park late in August.

For the quarter ended June 30, 1926, the company reported 64,923,573 passengers, against 68,261,621 in a similar quarter of 1925.

Canadian Roads Doing Well

Canadian electric railways are showing an increase in business which is not only substantial but must be regarded as distinctly satisfactory by holders of their securities. For each of the seven months ended July, the increases in number of revenue passengers carried was from 2.46 per cent to 6.36 per cent higher than for the corresponding months of 1925. What is more, the improvement of the Canadian systems in 1926 followed a small improvement throughout the whole of 1925, shown at 0.19 per cent.

For the month of July the increase in revenue passengers carried by the seven Canadian systems reporting was 5.66 per cent. The improvement for July is regarded as very satisfactory, since there was a slight decrease for July, 1925.

Deficits on York Radials Paid

The radial question in Toronto, Ont., took a new turn on Oct. 19, when the City Council adopted unanimously the Board of Control's report recommending that payment be made to the Hydro-Electric Power Commission of Ontario for the accumulated deficits on hydro operation of the York radials up to July 31 of this year. The amount involved is \$747,457, made up as deficits of \$700,693 for 1923, 1924, 1925 and 1926 and \$46,864 of accrued interest.

Conspectus of Indexes for October, 1926

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

	Latest	Month Ago	Year Ago	Since War	
				High	Low
Street Railway Fares*	Oct. 1926 7.40	Sept. 1926 7.36	Oct. 1925 7.31	Oct. 1926 7.40	May 1923 6.88
Electric Railway Materials*	Oct. 1926 155.4	Sept. 1926 154.2	Oct. 1925 150.9	Sept. 1926 247.5	Oct. 1924 148.5
Electric Railway Wages*	Oct. 1926 226.2	Sept. 1926 226.1	Oct. 1925 222.8	Sept. 1926 232	Mar. 1923 206.8
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Oct. 1926 202.9	Sept. 1926 203.2	Oct. 1925 202.7	July 1926 256.4	May 1922 167.4
Eng. News-Record Construction Cost (General) 1913 = 100	Oct. 1926 209.8	Sept. 1926 208.3	Oct. 1925 205.4	June 1926 273.8	Mar. 1922 162.0
U. S. Bur. Lab. Stat Wholesale Commodities 1913 = 100	Sept. 1926 150.2	Aug. 1926 149.2	Sept. 1925 159.7	May 1926 246.7	Jan. 1921 138.3
Bradstreet Wholesale Commodities 1913 = 9.21	Oct. 1 1926 12.79	Sept. 1 1926 12.70	Oct. 1 1925 14.15	Feb. 1 1926 20.87	June 1 1921 10.62
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Sept. 1926 158.5	Aug. 1926 155.7	Sept. 1925 159.0	July 1926 219.2	Mar. 1922 138.7
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Sept. 1926 166.8	Aug. 1926 165.3	Sept. 1925 168.2	July 1926 204.5	Aug. 1922 154.5
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Sept. 30 1926 3.594	Aug. 31 1926 3.542	Sept. 30 1925 3.717	July 31 1926 11.118	July 31 1924 3.187
Bus. Clearings Outside N. Y. City (Billions)	Sept. 1926 17.97	Aug. 1926 17.47	Sept. 1925 18.19	Oct. 1926 20.47	Feb. 1922 10.65
Business Failures Number	Sept. 1926 1360	Aug. 1926 1516	Sept. 1925 1234	Jan. 1926 2231	Aug. 1925 1353
Liabilities (Millions)	Sept. 1926 34.38	Aug. 1926 39.77	Sept. 1925 27.89	Jan. 1926 122.95	Aug. 1925 27.22

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

The action of the Council followed a conference between the Board of Control and C. A. Magrath, chairman of the Hydro-Electric Power Commission, at which Mr. Magrath insisted that these funds were needed at once by the commission to avoid financial embarrassment. Funds needed to cover the further deficit incurred between July 31 and Oct. 31 this year were not reported. In a letter to the Board of Control, recently made public, the Toronto Transportation Commission advised that the radials be abandoned because of their unprofitable return.

The poor showing of the radials and the subsequent hectic meetings on the disposition of these lines have been referred to previously in the ELECTRIC RAILWAY JOURNAL.

4,184,841 More Surface Line Riders in Chicago in Month

The monthly report of the Chicago Surface Lines for September points to an increase of 4,184,841 revenue rides over the number carried in the similar month last year. The total rides for the month were 127,149,619, of which 70,279,811 were revenue passengers, 52,926,708 transfer passengers and 3,943,100 free passengers. The average fare per ride was 3.82 cents.

During the first nine months of 1926 the Chicago Surface Lines has shown a consistent gain in traffic compared with

EARNINGS OF CHICAGO SURFACE LINES

September	1926	1925
Gross earnings	\$4,916,535	\$4,721,820
Operating expenses, taxes, etc.	3,889,973	3,753,402
Joint expense account	34,525	10,000
5 per cent interest on purchase price	671,493	671,965
Divisible receipts	320,543	286,453
City's share	176,299	157,549
Company share	144,244	128,904

the corresponding period of 1925. The addition of 100 new cars during September and October fortifies the company in its plans to care for the big increase in traffic expected during the Christmas shopping season.

Divisible receipts for September were \$320,543, after taxes, renewals, operating expenses and the 5 per cent interest on the purchase price, against \$221,855 in August and \$286,453 in September of last year.

Segregation of Delaware & Hudson Properties Authorized

The managers of the Delaware & Hudson Company were authorized by the stockholders at a special meeting on Oct. 26 "to transfer to a corporation or corporations (all the stock of which shall be owned by the Delaware & Hudson Company) all or any of the railroad properties, boat lines, traction lines, motor bus lines, hotels and other analogous interests belonging to it."

L. F. Lorce, president of the road, explained that no plan had matured to date for the segregation of the D. & H. coal properties, since the stockholders granted the board authority to sell the holdings at a meeting in May, 1925.

Commission Hears Chicago Rapid Transit Security Petition

Evidence bearing on the petition of the Chicago Rapid Transit Company for permission to issue and sell \$1,500,000 of 7.2 per cent prior preferred stock, series B, and on another, seeking authority to issue \$1,795,000 of first and refunding mortgage gold bonds, series A, was heard in Chicago on Oct. 26 by the Illinois Commerce Commission. Orders on both petitions will probably be issued within the next ten days.

The preferred stock is to be sold to reimburse the company for improvements already made this year.

As mentioned in the ELECTRIC RAILWAY JOURNAL for Oct. 16, a special meeting of the stockholders of the company is to be held on Dec. 9 to vote an increase in the company's capital stock from \$25,330,500 to \$30,330,500, to be issued in the form of prior preferred stock to provide for future capital requirements.

Receiver Appointed for Geneva Road

The Geneva, Seneca Falls & Auburn Railroad, Waterloo, N. Y., went into the hands of Lansing S. Hoskins and James M. Ryan, as receivers, on Oct. 20. The road was forced into bankruptcy by the Chatham & Phoenix National Bank & Trust Company, New York, representing the holders of \$504,000 of bonds on which the company was unable to pay interest due on Jan. 1, 1926. Operation will be maintained on the electric line and the Geneva Railway & Bus Line, a subsidiary.

The company operates about 14 miles of line. It was incorporated in 1913 as the successor to the Geneva & Auburn Railway, which had been sold under foreclosure.

Indianapolis & Cincinnati Reorganization Progress

Current newspaper accounts to the contrary notwithstanding, nothing definite has been done or even agreed upon regarding the proposed reorganization of the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind. Nor will anything definite be done along these lines until a decree is entered in the pending foreclosure suit, intended to clear up all debatable questions regarding the property to the end that those interested may know exactly how the matter stands in every respect. It is not possible to tell how soon this will be done, but it will probably be in the near future.

Changes in Financial Set Up Approved in New Jersey

At a special meeting of the stockholders of Public Service Corporation of New Jersey held on Oct. 19 the certificate of incorporation was by a vote of more than two-thirds of all classes of stock outstanding amended in accordance with the recommendation of the board of directors so as to:

1. Increase the authorized preferred stock from 1,000,000 to 2,000,000 shares.
2. Increase the common stock from 2,000,000 to 10,000,000 shares.

3. Provide that of the 2,000,000 shares of preferred stock, 1,250,000 shall be 6 per cent cumulative preferred.

4. Provide for the payment of monthly instead of quarterly dividends on 6 per cent preferred stock.

5. Provide for an exchange of the common stock outstanding at the time the amendment takes effect on the basis of one share of present stock for three shares of the common stock authorized by the amendment.

To the stockholders present at the meeting President McCarter said:

The corporation is having its best year. Its affairs were never in better condition than they are now nor have its prospects for the future ever been brighter. I have been in this work sufficiently long not to have any delusions about it, so I speak with some confidence when I say that the corporation's condition is very prosperous. We look forward to a continuance of this prosperity in the future, which, of course, will redound to the benefit of the stockholders.

Net Income Lower.—For the three months period ended Sept. 30, 1926, the passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was \$2,754,902, against \$2,760,996 for the similar period last year. Operating expenses and taxes increased from \$2,368,555 to \$2,409,750 for the three months period ended Sept. 30, 1926. After consideration of income deductions there was a net corporate income for the period from July through September of this year of \$268,009, against \$321,473 for the similar 1925 period.

Net of Eastern Massachusetts for Nine Months Up.—The Eastern Massachusetts Street Railway, Boston, Mass., reports net income of \$20,824 for September after charges, depreciation and taxes against \$50,904 in September, 1925. Nine months net income was \$550,892 after above charges against \$543,318 in the similar period of 1925.

Charitable Disbursements Large in Louisville.—The balance in the fund of the co-operative association of the Louisville Railway, Louisville, Ky., on Aug. 1, 1926, was \$4,366, and interest on deposits \$4.60. The disbursements, including sick benefits, death benefits, salaries and recreation, totaled \$1,822. The balance as of Aug. 31, 1926, therefore, was \$2,549.

Net Income Increases.—For the nine months period ended September, 1926, the gross revenues of the Twin City Rapid Transit Company and subsidiaries, Minneapolis, Minn., were \$9,479,051, against \$9,231,793 in 1925. Operating expenses increased from \$6,853,485 in 1925 to \$6,913,957 in the 1926 period. Net income also advanced from \$714,611 in 1925 to \$901,085 for the nine months period ended September, 1926.

Nine Months Net Off in Boston.—The Boston Elevated Railway, Boston, Mass., reports to the Department of Public Utilities for the quarter ended Sept. 30, 1926, gross revenue of \$7,836,886, compared with \$7,686,541 in the third quarter of 1925, and deficit after cost of service and dividends of \$1,081,119, against \$793,836. Gross revenue for the first nine months of 1926 was \$25,957,201, comparing with \$25,267,219 in the first nine months of 1925, and deficit after above charges of \$749,654, as contrasted with surplus of \$49,877 in the similar period of the previous year.

Personal Items

Another Employee Director Elected

W. E. Murphy, Chief Dispatcher, Made Representative of Employees on International Board

William E. Murphy, chief dispatcher for the International Railway, Buffalo, N. Y., was elected a member of the board of directors on Oct. 25. He is the second employee to be made a director, the other representative of the workers being George Burgain, motorman at Cold Spring station. By this action the employees will have double representation in discussions of the affairs of the railway.

Mr. Murphy is vice-president of the I. R. C. Co-operative Association, of



W. E. Murphy

which Mr. Burgain is president. Members of this association, comprising the employees of the company, collectively hold \$2,000,000, par value, of the company's bonds and stocks, have a saving fund of about \$100,000, and each member is protected by a \$1,000 life insurance policy. Under the Mitten co-operative plan the men have 50-50 jurisdiction with management in all discussions of wages, working conditions, discipline, etc.

The new director has been employed by the railway continuously for 26 years. His first position, as clerk in the engineers' office, paid \$35 a month. Shortly afterward he became time-keeper in the track department, from which position he went to the switchboard. In 1904 he was made a dispatcher, controlling the movement of cars, dispatching of the emergency wagons and attending to similar operating problems. In 1921 he was promoted to the position of chief dispatcher. His office is the nerve center of the entire system on the Niagara frontier, stretching from Buffalo to Niagara Falls, to Chippewa and Queenstown on the Canadian side, and through Lockport to Olcott Beach, which is on Lake Ontario.

Mr. Murphy is the third employee to be elected to the position of director of the company. In 1925 James E. Deaton, full-blooded Mohawk Indian, a pitman in the shops of the company at Niagara Falls, Ont., and then president of the I. R. C. Co-operative Association, was thus honored. He was succeeded by George E. Burgain when the latter became president of the association, and Mr. Burgain is now joined by his vice-president. Together they will represent the employees in the most intimate discussions of company policy and progress.

Personnel Changes in Fitchburg

Emerson W. Baker, district attorney, has been elected president of the re-organized Fitchburg & Leominster Street Railway, Fitchburg, Mass. In this capacity he succeeds Wesley W. Sargent, resigned.

George R. Wallace, Jr., was elected vice-president to fill the vacancy caused by the resignation of Herbert I. Wallace.

Louis H. Cushing is general manager.

Edwin G. Ordway is serving as superintendent of traffic. He has been adjuster of claims of the company for many years.

B. J. Wahle Shore Line Coach Official

Bernard J. Wahle, for the last year and a half assistant general manager and assistant secretary and treasurer of the Calumet Motor Coach Company, Hammond, Ind., has been appointed assistant treasurer and auditor of the Shore Line Motor Coach Company, Gary, Ind.

Since he was graduated from Crane Technical College in Chicago in 1912, Mr. Wahle has been connected with various banking and industrial concerns in the capacity of accountant. He was with the Continental & Commercial National Bank, Chicago, for five years prior to the war, during which he served as paymaster and financial representative of the U. S. Navy at Newport, R. I., and Baltimore, Md.

In 1919 he resigned from the Navy to become associated with a firm of public accountants in Chicago. Later, he went to work for the Industrial Appliance Company of that city as auditor.

As operating engineer for the Yellow Cab Company in Chicago, he was subsequently for four years engaged in assisting insolvent taxicab companies to reorganize. In 1925 he entered the employ of the Calumet Motor Coach Company, an independent bus line in Hammond, Ind., but became connected with the Shore Line Motor Coach Company when the Calumet company was brought under unified management last August.

The Shore Line Motor Coach Company is jointly controlled through stock ownership by the Chicago, South Shore & South Bend Railroad and the Gary Railways, members of the Midland group of Insull utility companies.

T. W. Noonan General Manager of Pittsburgh Bus Operation

T. W. Noonan has recently been appointed general manager of the Pittsburgh Motor Coach Company, a subsidiary of the Pittsburgh Railways, Pittsburgh, Pa. He became affiliated with railway work in 1907 when he entered the employ of the Pittsburgh Railways. He served successively as payroll clerk, in the traffic department, in the general manager's office, in the overhead lines department, as secretary to the president of the Duquesne Light Company, and the Pittsburgh Railways. In 1917 he joined the U. S. Army and went overseas. He was discharged from military service in 1919. He re-entered the employ of the Phila-



T. W. Noonan

delphia Company and affiliated companies in June, 1919, as chief clerk to the operating assistant to the president. His connection with the Pittsburgh Motor Coach Company dates from Dec. 1, 1925, when he assumed the duties of service manager. It is of this company that he was appointed general manager some few weeks ago. The Pittsburgh Motor Coach Company operates 33 miles over territory in and surrounding Pittsburgh.

Mr. Noonan was born in 1888 in Pittsburgh. He attended the grade and high schools there and was graduated from the Duquesne University.

Bill Boyce on Pittsburgh Conference Board

W. H. Boyce, commercial manager of the Pittsburgh Railways, Pittsburgh, Pa., has succeeded Frank R. Phillips as the railway company's representative on the Traction Conference Board. Pittsburgh is represented on the board by two members and the boroughs and townships by a fourth member. As noted previously in the ELECTRIC RAILWAY JOURNAL Mr. Phillips has been appointed to the Duquesne Light Company.

Changes in Westinghouse Engineering Department

R. E. Hellmund Is Made Chief Electrical Engineer and A. M. Dudley is Made Engineering Supervisor

R. E. Hellmund, formerly engineering supervisor of development for the Westinghouse Electric & Manufacturing Company, has been appointed to the newly created office of chief electrical engineer and A. M. Dudley, formerly manager automotive equipment engineering department, has been made engineering supervisor of development, the position left vacant by Mr. Hellmund's promotion.

Mr. Hellmund's activities in his new position will be principally in connection with electrical development work to assure the adequacy and progressiveness of designs and properly to co-ordinate this work throughout the engineering department. He will continue to serve as chairman of the engineering educational committee and will also retain his connection with the supervisory group on development and the patent board.

Mr. Hellmund entered the employ of the Westinghouse company in 1907 as a designer of induction motors. Later he was engaged in general engineering work and, in 1912, was placed in charge of the design of all direct-current and alternating-current railway motors. In 1917 he engaged in miscellaneous consulting work for the company. In this capacity he continued until 1921, when he was appointed engineering supervisor of development. He continued in this capacity until his recent promotion.

He was born in Gotha, Germany, on Feb. 2, 1879, and was graduated from the College of Illmenau in 1898 with the degree of electrical engineer.

Mr. Dudley entered the service of the Westinghouse company as an apprentice in 1904. Shortly afterward he was given a position in the company's engineering department, where he was engaged in the design of alternating-current motors and controllers. Early in 1906 he was made commercial and general engineer in the industrial and power sales department.

In 1907 he was placed in charge of the alternating current motor section and continued in this position until 1918, when he was placed in charge of the design of starting, lighting, and ignition equipment for automobiles. In 1920 he was made manager of the automotive equipment, engineering department. This position he held until 1924, when he was appointed to assist Mr. Hellmund in his work as engineering supervisor of development.

In the capacity of engineering supervisor of development Mr. Dudley will be responsible for all central activities of the engineering department in connection with the development budget and program of the electrical group. He will continue to act as secretary of the engineering educational committee and secretary of the supervisory group on development.

Mr. Dudley has taken out numerous patents on the details of construction of electric machinery. He was born in Cincinnati, Ohio, in 1877, and was grad-

uated from the University of Michigan in 1902 with a degree of bachelor of science in electrical engineering.

Messrs. Egolf and Savage Advanced by North Shore

John F. Egolf, former general manager of the Aurora, Elgin & Fox River Electric Company and for the past few months assistant to the president of the Chicago, North Shore & Milwaukee, Chicago, Aurora & Elgin and Chicago, South Shore & South Bend Railroads, was appointed general manager of the Chicago, North Shore & Milwaukee Railroad on Oct. 26. He succeeds Jesse S. Hyatt, who was recently made engineering assistant to Bernard J. Fallon, vice-president of the North Shore, South Shore, Aurora & Elgin and Chicago Rapid Transit Lines.

Mr. Egolf began his railroad career as a conductor on the Columbus, Ohio, street railways in 1902 and from that position rose to assistant superintendent of the Ohio Electric Railway. Later he became general manager of the Springfield & Xenia Railway. He was president of the Illinois Electric Railway Association in 1925.

Simultaneous with Mr. Egolf's appointment, Howard P. Savage, newly elected commander of the American Legion and former superintendent of the maintenance of way division of the Chicago Rapid Transit Company, was named assistant general manager of the North Shore Line. Mr. Savage entered the service of the rapid transit company as track foreman in 1913. In his new position he succeeds Bert W. Arnold, who will continue as manager of the motor coach department of the company and will also assist B. J. Fallon, vice-president in charge of operation.

Harry B. Ivers Joins Parker Staff

Harry B. Ivers, widely known among electric railway executives of New England for his service on the former Old Colony Street Railway and on various Maine properties, has been appointed head of the newly created co-ordinating department of C. D. Parker & Company, Boston, Mass., investment bankers. He will report to Vice-President Bowen Tufts.

In 1893 Mr. Ivers entered the electric railway field on the Norfolk Suburban Street Railway and during nine years of service on that property and the Old Colony Street Railway rose to the post of assistant treasurer of the latter. For four years he was treasurer and manager of the railway, lighting and gas utilities at Westerly, R. I., and then went to the Milford Electric Light Company of New Hampshire, where he was occupied in hydro-electric development. He next became treasurer and assistant to the president of the Bangor Railway & Electric Company, Bangor, Me., and for eight years served as general manager of the Lewiston, Augusta & Waterville Street Railway. He was the first general manager of the Cumberland County Power & Light Company, Portland, Me., during this period. Since 1917 Mr. Ivers has been engaged in various activities, including a term of service in the banking business.

H. C. Couch Honored Again

President of New Arkansas Organization One of the South's Most Useful and Prominent Citizens

When the record of utility achievement in the South has been written, one of the most conspicuous names on the roster of useful citizens will be H. C. Couch, prosperity promoter of Mississippi and Arkansas. His dauntless pioneering and untiring energies in behalf of these two states have won public approval and recognition from time to time within the past four years. An added distinction has been conferred upon him in his recent election as president of the new utility group, the Arkansas Power & Light Company, formed by the Electric Bond & Share Company, New York, N. Y. This merger brings under one corporate head public utility properties in Arkansas and honors, because of his executive and financial ability, one who perhaps knows more about Arkansas and its possibilities than any other man.

As president of the new Arkansas Power & Light Company Mr. Couch also serves as president of the Pine Bluff Company, operating 10 miles of electric railway in Pine Bluff, Ark. Assisting Mr. Couch in his work will be two vice-presidents, namely, C. J. Griffith, vice-president and general manager of the Arkansas Central Power Company, and J. L. Longino, vice-president and general manager of the Arkansas Light & Power Company. Other officers will be former officials of the Arkansas Light & Power Company, the Arkansas Central Power Company and the Pine Bluff Company.

Harvey Couch is not so much interested in the recognition and subsequent honors as he is in having gratified, to some extent, his ambition to play a part in the great utility development of the South. His goal was rather to make his particular section a better place in which to live, and in this he has succeeded. Railway patrons, manufacturers and farmers, the latter especially, are unanimous in the belief that if a young mail clerk, a son of Georgia parents, had not turned his attention twenty years ago to utility enterprises the new South would still be a dream.

Born in Magnolia, Ark., 49 years ago, Mr. Couch worked in his early youth as a mail clerk running between Memphis and Texarkana. While at this job he determined to make the life of farmers an easier and better one by building more telephone lines. He paid another clerk \$100 to swap runs and he took the run from McNeil, Ark., to Bienville, La. In partnership with the postmaster at Bienville he sold coupons for telephone service to the farmers, and with this money and their reputation obtained credit for wire and insulators and built a telephone line, using small trees for poles. His subsequent selling coup, by which the Southwestern Bell Telephone Company parted with \$1,500,000 in favor of the Couch-Longino combination, is a thrilling chapter in the romance of the South.

Mr. Couch next turned his attention and energies to the electric light and power possibilities in Arkansas, acquir-

ing the systems of Arkadelphia and Malvern. As president of the Arkansas Light & Power Company and the Pine Bluff Company his outstanding services have been mentioned previously in these columns. The railway line he reconstructed until it was put on a paying basis. He saw the same opportunities for service in Mississippi that had stimulated him in Arkansas. He and his associates acquired public service properties in Jackson, Columbus, Greenville and Vicksburg. The Mississippi Power & Light Company was organized, with C. P. Couch, brother of H. C. Couch, as vice-president and general manager at Jackson.

True it is that many railway and power magnates made valuable contributions to utility progress, but it is to be remembered that Mr. Couch succeeded in the midst of war-time struggle and industrial stress. With him success was within—no chameleon judgment, but an adamant purpose to win for others and himself some of the amenities of life to be lived in Arkansas and vicinity. In the midst of sterner realities he remained visionary, an idealist, with performance always part of the dream.

The Fine Bluff Chamber of Commerce good citizenship award of 1925 was presented to him early this year. This trophy was voted to him by the unanimous opinion of a committee representing, in the words of the *Pine Bluff Commercial*, "every activity, every walk of life and every phase of community life in Pine Bluff." A few years ago the Mystic Shriners elected him a potentate. By that title he will always be known in the utility field.

A. W. Brownsworth has succeeded Fred Heckler as master mechanic of the Lake Shore Electric Railway with office at Sandusky, Ohio.

Thomas A. Wright, Jr., has resigned as purchasing agent of the Wilkes-Barre Railway, Wilkes-Barre, Pa. He has been connected with the company in many different capacities for the past thirteen years.

Obituary

Frederick M. Nellis, special representative at New York of the Westinghouse Air Brake Company and secretary since 1899 of the Air Brake Association, died on Oct. 16. He entered the service of the Westinghouse Air Brake Company in 1882 as a demonstrator on its instruction car. Later he went to Cornell University and took a special course in mechanical engineering, remaining at Cornell for three years and being graduated with the class of 1899. He then resumed his association with the Westinghouse Air Brake Company, serving in various responsible positions. For a number of years he was on the editorial staff of *Locomotive Engineering*. Mr. Nellis was born in 1862 at Tionesta, Pa. Early in his career he was a locomotive engineman on the Panhandle Division of the Pennsylvania Railroad. Throughout the remainder of his life he was a member of the Brotherhood of Locomotive Engineers.

Manufactures and the Markets

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

Brill Will Build Philadelphia's 150 New Subway Cars

A contract for building 150 high-speed electric cars for Philadelphia's new Broad Street subway was awarded to the J. G. Brill Company on Oct. 26 by Henry E. Ehlers, Director of City Transit for the city of Philadelphia.

The Brill bid, which was the lowest of several received some weeks ago, was \$4,039,434, and in awarding the contract Director Ehlers placed the limit at \$4,500,000 to take care of unforeseen expenditures. Under the specifications delivery must begin in May of next year and continue until the full consignment has been delivered to the Fern Rock terminal yard.

The cars will be built at the Brill plant in Philadelphia. The Department of City Transit is to supply the motors, motor control equipment, air brake equipment, door-operating devices, couplers and draft gears and other appliances. Bids for this equipment will be advertised shortly.

Under the Brill contract ten extra trucks are to be delivered. It is also planned to equip ten of the 150 cars with Hyatt roller bearings to determine the effectiveness of roller bearings in this type of equipment.

realism of the special is heightened by the fact that it has a smokestack which emits smoke, a real bell and whistle, a sandbox, and Westinghouse air brakes.

Training Apprentices for Industry

A thoroughgoing treatise on the subject of apprenticeship in industry has been issued by the department of manufacture of the Chamber of Commerce of the United States. Information and experiences in the development of industrial training are very completely reported in this booklet, and as a result of the investigation which has been made in preparing the report a number of deductions are made which will be of real interest to all executives charged with the supervision of mechanics and shop labor. Special emphasis is laid upon the value of co-operating with manufacturers and industrial organizations in the training of apprentices by city school systems. It was found as a result of a survey conducted on this point that a large majority of vocational education is carried on in direct conjunction with the industrial organizations of the communities involved, and that the courses described are laid out with a view to training young men for specific lines of employment.

While training of employees for railway shop practice is not specially considered, the subject of industrial apprenticeship has been treated in a sufficiently broad manner to make it well worthy of the attention of railway executives and of railway equipment manufacturers. Apprenticeship for both large and small companies is considered, and the experiences of a number of typical companies are considered in outlining the results of the survey. Opinions of representatives of employers, labor and the engineering profession on the subject of apprenticeship are included.

To Stimulate Interest in Good Roads

A desire to stimulate interest in the good roads movement has actuated the Kelly-Springfield Tire Company to send out a "Good Roads Special" on a tour of the United States. The car, from the front, has the appearance of a locomotive, and from the rear, of an observation car. It was first introduced at the convention of the American Electric Railway Association in Cleveland during the week of Oct. 4. The



Every Section of the Country Will Be Visited by This Unusual Herald of the Good Roads Movement

Frank Fageol Resigns

Frank R. Fageol has just announced his resignation from the American Car & Foundry Motors Corporation, New York, N. Y. Mr. Fageol was formerly head of the Fageol Motors Corporation of Oakland, Cal., and the Fageol Company of Kent, Ohio. These two companies were consolidated with the American Car & Foundry Company some time ago and the American Car & Foundry Motors Corporation was founded.

Mr. Fageol has not announced any definite plans for the future, aside from the fact that he intends to take a much-needed vacation in the next few months. It is understood that he will retain no affiliation with the American Car & Foundry Motors Corporation or with the subsidiary Fageol companies. He is now in California and expects to remain on the coast for several weeks.

Rail Orders Are Not Fluctuating

Orders for steel rails thus far placed in the last third of the current year for delivery in 1927 total about 550,000 tons, it is reported. The total last year, September to December inclusive, reached approximately 1,500,000 tons, and it is estimated that the current year's buying will be about the same. No material extensions of existing rail lines are indicated in the purchases for 1926, the total tonnage being almost entirely for replacement use.

J. G. Brill Dividend Period Coincides with Calendar Year

A dividend of \$2.91½ a share has been declared by the J. G. Brill Company, Philadelphia, Pa. This is at the rate of \$5 per share per annum on outstanding common stock for the period from March 1, 1926, to Oct. 1, 1926, to adjust the dividend period to coincide with the calendar year. On March 1 a quarterly dividend of \$1.25 a share was paid on the common stock, which was the rate paid quarterly during 1925. The regular quarterly dividend of 1½ per cent was also declared on the preferred stock. Both of the above dividends are payable Nov. 1 to holders of record Oct. 29.

A Significant Demonstration of Electrical Transportation

On Oct. 29 the directors and officials of the General Electric Company participated in a unique demonstration of various types of electrical transportation mediums. Gathering at the Grand Central Station in New York City at 10 o'clock Friday morning, the General Electric representatives, officials of the New York, New Haven & Hartford Railroad, and various newspaper and technical journal representatives boarded a special two-car train which was pulled to New Rochelle by one of the New Haven standard electric locomotives.

At New Rochelle this locomotive was detached from the train and an oil-electric locomotive took its place. Again, at Stamford, the oil-electric locomotive

was dropped off and one of the General Electric Company's a.c.-d.c. locomotives took up the load. When South Norwalk, Conn., was reached the party detrained and boarded a gas-electric rail car which was waiting for them at that point. Thence they proceeded to Bridgeport, Conn., where the party was picked up by gas-electric buses and taken to the General Electric plant located there. The officials and guests were thus enabled to compare the different types of electrical transportation equipment in regular railway service, as the various stops and changes of motive power were made, and it was possible to draw important conclusions as to the relative merits of each form of equipment for main and branch-line service.

Upon reaching Bridgeport the board of directors and other officials of the General Electric Company went directly to the company's plant which is located there. Newspaper representatives and technical journalists were taken to the University Club for lunch, while the General Electric board went into session for a short meeting. Later the directors were served with luncheon at the plant, where they were joined by a number of prominent local business

men, Governor Trumbull of Connecticut, the Mayor of Bridgeport and others. Following the luncheons those who so desired were conducted through the General Electric plant, while the others returned by regular trains to New York or other points.



Experimental Gas-Electric Snowplow in Use in Philadelphia Last Winter

All save four of the members of the General Electric board of directors were present at the meeting in Bridgeport. In addition, F. C. Pratt, G. P. Baldwin, J. G. Barry, E. W. Allen, W. B. Potter and H. L. Andrews, the two latter executives of the railway department, were on hand. E. J. Pearson, president of the New Haven Railroad, and two directors of that road, J. H. Harding and W. B. Lashar, were in the party that went up from New York.

Westinghouse Billings Continue to Rise

For the quarter ended Sept. 30, 1926, orders amounting to \$41,008,310 were reported by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., as compared with \$41,250,000 in the corresponding quarter a year ago. The sales billed showed an increase this year, totaling \$49,313,230, as against \$46,700,000 in the similar

To Join the Yellow Truck & Coach Manufacturing Company

Raymond C. Snell, formerly in the electric and steam railroad division of the national sales department of the White Company, Cleveland, has joined the Yellow Manufacturing sales organization as assistant to H. E. Listman, vice-president. Mr. Snell has been with the White Company for three years. Prior to this time he was connected with the electric railway industry. Mr. Snell, as assistant to Mr. Listman, will act as special representative of the Yellow Truck & Coach Manufacturing Company. His headquarters will be in Chicago.

Gas-Electric Drive for Snowplows

Fifteen snowplows equipped with gas-electric drive are being obtained by the Philadelphia Rural Transit Company, bus operating subsidiary of the Philadelphia Rapid Transit Company,

for use this winter in keeping the roads open for its large fleet of buses, which also have gas-electric drive. The plows were adopted after an experimental unit was tried by the company last winter.

Incorporation of gas-electric drive in this service marks the first use of such transmission for other than buses. The plows are mounted on the fronts of trucks and are being manufactured by the Walters Motor Truck Company of Long Island. The electrical equipment, similar to that in the hundreds of buses used by the railway, is being supplied by the General Electric Company. The snow fronts are demountable, so that the trucks will be of service during the summer.

The plows are furnished with two-motor equipment, thus eliminating the differential and reducing wheel slippage and skidding. Some of the inherent characteristics of gas-electric drive found advantageous in bus operation, such as higher schedule speeds and greater comfort for passengers, are not of so much importance in a consideration of plow equipment, but other advantages, such as the impossibility of racing under load or stalling the engine, are important.

Track and Line

Utah Light & Traction Company, Salt Lake City, Utah, has been granted permission by the county commission to provide a single-track turnout or Y track at the intersection of 33d Street South and Highland Drive running eastward.

New York, N. Y.—The Board of Transportation on Sept. 14 asked for bids, receivable Oct. 8, for the construction of the elevated portion of the Fourteenth Street-Eastern subway from Stewart Street, connecting with the Broadway elevated structure, Brooklyn, to East New York. This is the only remaining section of the Fourteenth Street-Eastern line not under construction.

Wisconsin Gas & Electric Company, Kenosha, Wis., has started the work of replacing the single track in Racine on its West Sixth Street line with double track from Lafayette Avenue west to the Kinzie Avenue bridge. Consideration is being given to the plan of extending the West Sixth Street line on Linderman Avenue over the North Shore tracks into West Racine, thence to the Manree Park addition.

Pacific Electric Railway, Los Angeles, Cal., started service recently over the 9,700-ft. extension to the Reliance Rock Company's plant near Azusa. The new line, which branches off the Covina line near Bassett, using an electrified section of the Southern Pacific Company tracks for a distance of 4,500 ft., extends in a northeasterly direction from Bassett. Construction work on the project, costing approximately \$200,000, was begun on April 17, and but 3½ months was required to bring it into operating condition. Seventy-five-pound rail was used and catenary type of construction employed in the overhead. An interchange yard of six tracks, capable of storing 125 cars, was constructed. Storage yards adjacent to the rock company's plant also will care for the storage and handling of approximately 100 cars. At the present time the Reliance Rock Company is the only industry served by the new extension, this company's product being crushed rock, sand and gravel, used largely in highway construction in this section.

Power Houses, Shops and Buildings

Los Angeles Railway, Los Angeles, Cal., has given a contract to the Willard Brent Company for the erection of a modern brick, reinforced concrete and steel structure to be used for general bus, truck and auto inspection and as a repair shop. The building will be 310 ft. long and 100 ft. wide. It will provide pit accommodations for 30 buses. It will also contain store room, machine shop, battery room and offices for the superintendent of automotive equipment. The machine shop will be equipped with lathes, milling machines and cylinder grinders. Plans call for three traveling cranes to run the entire length of the building. All of the plans for the new structure were

drawn by the engineering department of the railway.

Nashville Railway & Light Company, Nashville, Tenn., has been granted the permit for the construction of a \$20,000 fireproof one-story garage. The building will be located on Fourth Avenue, North, adjoining the carpenter shop of the company's car shops, and will be used as a temporary storage garage for the company's motor vehicles, including the new buses which are reported soon to be put in operation.

Trade Notes

Silent Hoist Winch & Crane Company, Brooklyn, N. Y., announces the removal of its works and general offices into its new building at 762 to 772 Henry Street, Brooklyn. The company manufactures winches, cranes and derricks for motor trucks, and electric and gasoline car pullers, hoists and winches, as well as equipment to meet unusual requirements in hoisting work.

Sullivan Machinery Company, Chicago, Ill., announces the appointment of J. E. M. Schultz as manager of its office in Dallas, Tex., to take the place of D. H. Hunter, who has resigned.

G. C. Barry has been appointed assistant to E. G. Hines, general sales manager of American Brown Boveri Electric Corporation, New York, N. Y.

National Carbon Company, Inc., Cleveland, Ohio, has prepared a moving picture entitled "Behind the Pyramids," which shows in a very interesting manner the manufacture, application, operation and care of carbon brushes and other carbon products used in the electrical industry. This picture will be shown before technical society meetings, operating department groups and engineering college classes. There are three reels of film, requiring approximately 45 minutes for showing. Arrangements for showing this film may be made by writing to the carbon sales division, National Carbon Company, Inc., Cleveland, Ohio, or through its sales engineers.

A. D. McKerrow has been appointed sales representative in central New England for the Line Material Company, South Milwaukee, Wis. Mr. McKerrow's headquarters will be at 10 High Street, Boston, Mass. He was formerly manager of the paper and rubber mill department of the Westinghouse Electric & Manufacturing Company's New England office in Boston and prior to that was employed in the engineering and commercial departments of the New England Power Company, Worcester, Mass.

Indianapolis Street Railway, Indianapolis, Ind., has completed contracts for financing and building five electric substations mentioned in the ELECTRIC RAILWAY JOURNAL, issue of Sept. 18, 1926, page 482, and designed to replace completely the present methods of supplying power to the Indianapolis street car lines. Under the contracts more than \$600,000 will be spent immediately, the end being more dependable and faster service. The improved plan of supplying current includes four substations of the automatic and one of

the manually operated type. Construction on the new stations will begin immediately. The contract for the electrical equipment provides for shipments by units, covering a period of about four months, and the building program calls for completion of the buildings in time to house the equipment as it is received. The equipment will be provided by the Westinghouse Electric & Manufacturing Company and will consist of transformers and rotary converters.

New Advertising Literature

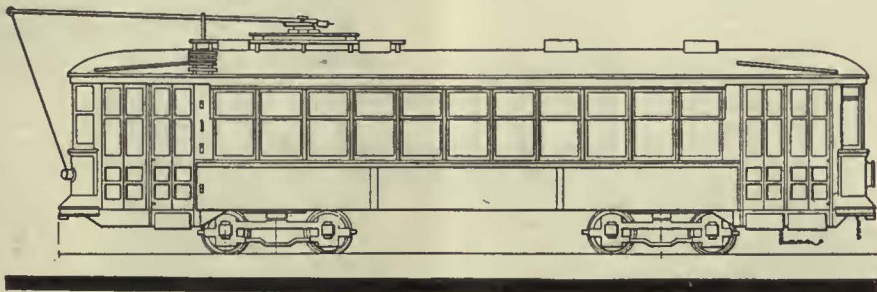
Electric Railway Improvement Company, Cleveland, Ohio, announces the publication of three new catalogs bearing on steel arc-weld rail bonds, portable arc welding and bonding equipment for voltages above 400 and copper arc weld rail bonds. Circular No. 15 outlines a new method of directly copper arc welding rail bonds to mine and railway rail and describes the effect of a new type of copper arc welding rod which carries a special coating. Circular No. 16 is a complete treatise on the various types and methods of arc weld bonding of railway and mine rail and contains a considerable amount of data of value to bonding crews, as well as to purchasing and engineering departments. The Erico type SR portable bonding and arc welding outfit is described in circular No. 17. This circular gives complete data on the use of this equipment for electric welding, brazed bonding and arc welding. In addition to the description of the welding, pictures and explanatory matter are given on a new type of trailer which has just been brought out by the company.

J. G. Brill Company, Philadelphia, Pa., has issued a leaflet giving information on savings in operating costs effected by new cars on four railway properties where modernized rolling stock has been placed in service.

Cornell Iron Works, Inc., Long Island City, N. Y., has issued a new 32-page catalog on steel rolling shutters and doors. The publication describes steel rolling doors and labeled Underwriters' rolling fire doors and includes details of construction with full dimensions and specifications. Fifty actual installations of these doors and shutters in factories, warehouses, shops, etc., are described and illustrated.

Metal, Coal and Material Prices

Metals-New York	Oct. 26, 1926
Copper, electrolytic, cents per lb.	13.80
Copper wire, cents per lb.	16.00
Lead, cents per lb.	8.25
Zinc, cents per lb.	7.56
Tin, Straits, cents per lb.	69.00
Bituminous Coal, f.o.b. Lines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	\$7.375
Somerset mine run, Boston, net tons	4.125
Pittsburgh mine run, Pittsburgh, net tons	2.675
Franklin, Ill., screenings, Chicago, net tons	1.525
Centrl, Ill., screenings, Chicago, net tons	1.45
Kansas screenings, Kansas City, net tons	2.35
Materials	
Rubber-covered wire, N. Y., No. 14, ptr 1,000 ft.	\$5.75
Weatherproof wire base, N. Y., cents per lb	17.75
Cement, Chicago net prices, without bags	2.10
Linsed oil, (5-bbl. lots), N. Y., cents per lb.	11.50
White lead in oil (100-lb. keg), N. Y., cents per lb.	15.25
Turpentine (bbl. lots), N. Y., per gal.	\$0.89



Safety Cars that are "Safe"

Recently the Alabama Power Company placed an order for double truck, single end safety cars. They will have a seating capacity of 53 and will weigh 32,000 lbs. each.

In the designing of these cars safety was the major consideration. Included in the specifications is every conceivable safety device to make these real safety cars.

Of course the principal specifications include

Peacock Staffless Brakes

Peacock Staffless have three times the braking capacity of ordinary hand brakes. Their 144-in. chain winding capacity insures adequate braking power even though brake shoes are worn and brake rigging is loose. Their installation and maintenance costs are low. They occupy minimum platform space. There are many other features that adapt Peacock Staffless Brakes to the modern safety cars. Write for facts, figures and estimates.



National Brake Company, Inc.

890 Ellicott Square, Buffalo, N. Y.

Canadian Representative

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



One of the Northland Transportation Company's Goodyear-equipped buses; insert of Goodyear Pneumatic Bus Tire

GOODYEAR

Copyright 1926, by The Goodyear Tire & Rubber Co., Inc.

“Eight Years of Wonderful Service”

“We have been constant users of Goodyear Tires during the past eight years,” writes Mr. C. E. Wickman, General Manager of the Northland Transportation Company, Minneapolis, Minnesota.

“Our tire performance,” Mr. Wickman continues, “has been very satisfactory.

“During the past six months we have removed from service several Goodyear Tires with exceptional mileage, averaging as high as 40,000 miles per tire.

“We are now operating 134 observation- and parlor-car buses. Some make as much as 9000 miles per month with our long rural routes.

“Goodyear Bus Tires have given us wonderful service so far as

safety and tire economy are concerned.”

* * *

Goodyear Bus Tires give wonderful service wherever they are used—in Minnesota snows, Iowa mud, California mountains, New York and Chicago streets.

They are more durable, more dependable, better cushioning, and they cost less per tire mile.

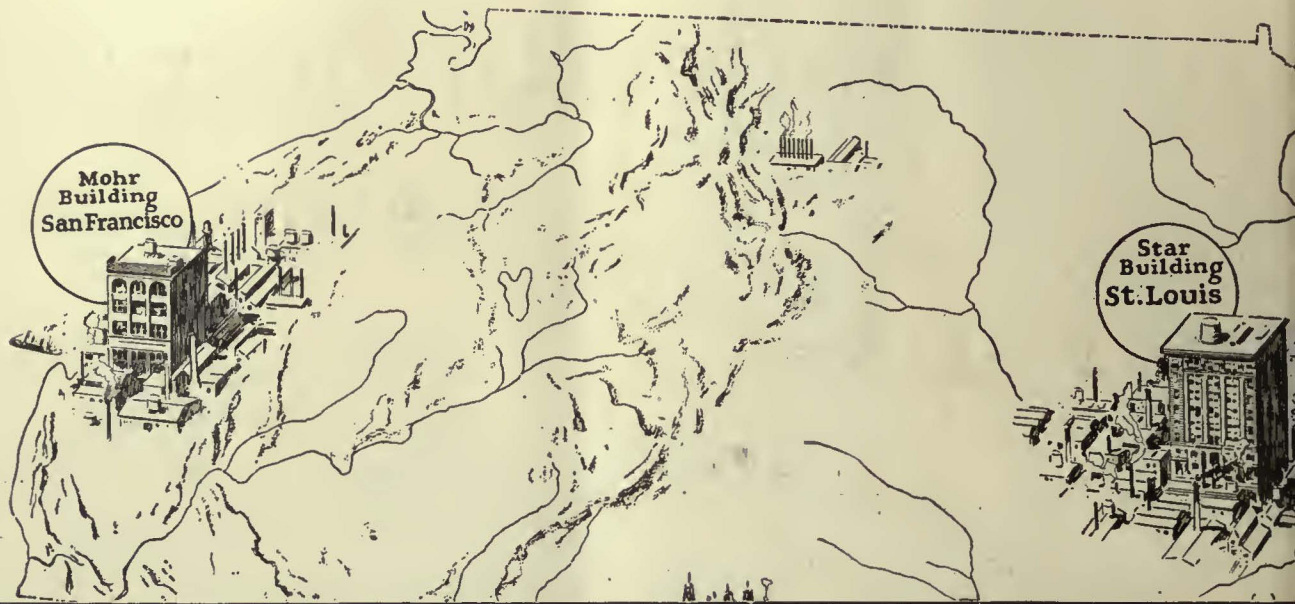
* * *

Goodyear Tires, made with that extra-durable, extra-elastic fabric developed by Goodyear for Goodyear Pneumatic Tires—SUPERTWIST—provide the last word in active, tractive, secure and long-wearing service at low tire cost per mile. Only Goodyear Tires are made with SUPERTWIST—yet they cost you no more.

*More people ride on Goodyear Tires
than on any other kind*

BUS TIRES

Made with SUPERTWIST



Knowledge of Industry

In the heart of the industrial centers of America, the McGraw-Hill Publishing Company has placed its district offices—that manufacturers may have available quickly and conveniently the McGraw-Hill service, data and knowledge of industry.

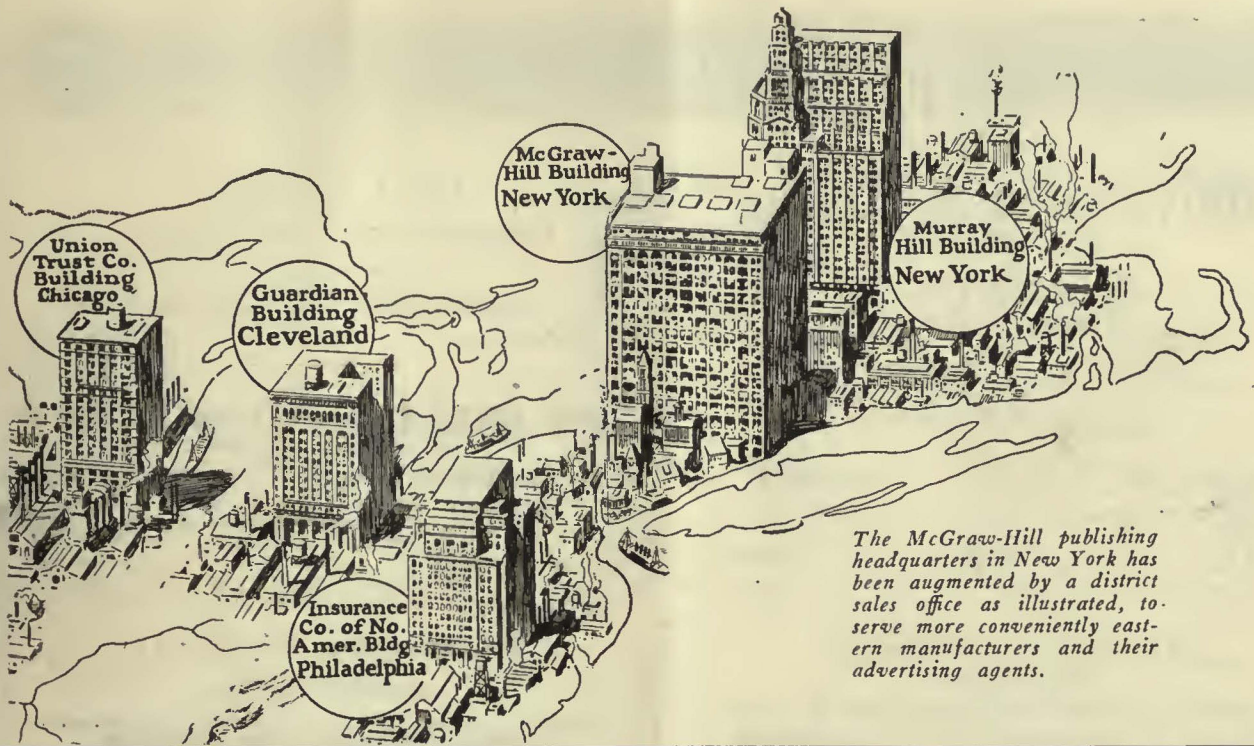
Every manufacturer who would sell industry more efficiently is now almost in the shadow of a McGraw-Hill office. Right at his elbow is the identical knowledge of industry and industrial marketing which has proved of such value to manufacturers who have availed themselves of it.

Each office is in charge of a district manager, who, through previous experience in industry or long service with McGraw-Hill, is well qualified to counsel with manufacturers on methods of selling to industry. His staff includes Marketing and Advertising men who have been drawn from industry, and whose contacts with industry are kept fresh by constant work on industrial selling problems.

Back of these men, as a reserve force of the district office, are the entire McGraw-Hill editorial, circulation, marketing and advertising staffs. Manufacturers consulting these district offices are thus assured all of the McGraw-Hill resources in applying the McGraw-Hill Four Principles of Industrial Marketing to their own selling.

These Four Principles are fundamental to waste-free selling. Briefly stated they are: (1) Determination of Markets; (2) Their Buying Habits; (3) Their Channels of Approach; (4) Appeals that Influence.

While each manufacturer is best able to apply these Four Principles for himself, the McGraw-Hill Publishing Company can be of material assistance in counseling with manufacturers and in either supplying data or suggesting how it may be obtained. This service is gladly furnished and we welcome the opportunity to serve manufacturers and their advertising agents in the interest of more effective marketing. A conference may be arranged, either in your office or a McGraw-Hill office.



The McGraw-Hill publishing headquarters in New York has been augmented by a district sales office as illustrated, to serve more conveniently eastern manufacturers and their advertising agents.

Brought to Industry's Door



McGraw-Hill's District Office Facilities—

105 advertising salesmen, whose first function is to advise on marketing problems, serve industry and trade through McGraw-Hill district offices.

36 seasoned advertising planners and writers and 20 artists, all trained in the appeals and mechanics of industrial advertising, supplement the district offices' marketing staffs.

These men and 108 McGraw-Hill editors have a background of practical experience in selling or production in 58 broad classifications of industry.

All data relating to production, marketing and buying practices developed by any district office will be made available by any other district office.

McGraw-Hill has its own telegraphic facilities in New York headquarters for expediting contact with district offices and industry.

This district office set-up is in conformity with the McGraw-Hill Four Principles of Industrial Marketing which stipulate "selling in terms of the prospect's problems."

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

McGraw-Hill Publications

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

CONSTRUCTION & CIVIL ENGINEERING

ENGINEERING NEWS-RECORD
SUCCESSFUL METHODS

ELECTRICAL

ELECTRICAL WORLD JOURNAL OF ELECTRICITY
ELECTRICAL MERCHANDISING

INDUSTRIAL

AMERICAN MACHINIST INDUSTRIAL ENGINEER
CHEMICAL & METALLURGICAL ENGINEERING
POWER

MINING

ENGINEERING & MINING JOURNAL
COAL AGE

TRANSPORTATION

ELECTRIC RAILWAY JOURNAL
BUS TRANSPORTATION

OVERSEAS

INGENIERIA INTERNACIONAL
AMERICAN MACHINIST
(European Edition)

RADIO

RADIO RETAILING

CATALOGS & DIRECTORIES

ELECTRICAL TRADE CATALOG
ELECTRICAL ENGINEERING CATALOG
RADIO TRADE CATALOG
KEYSTONE CATALOG KEYSTONE CATALOG
(Coal Edition) (Metal-Quarry Edition)
COAL CATALOG CENTRAL STATION DIRECTORY
ELECTRIC RAILWAY DIRECTORY
COAL FIELD DIRECTORY
ANALYSIS OF METALLIC AND NON-METALLIC
MINING, QUARRYING AND CEMENT INDUSTRIES

Bankers and Engineers

Ford, Bacon & Davis Incorporated Engineers

115 Broadway, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

The J. G. White Engineering Corporation

Engineers—Constructors

Oil Refineries and Pipe Lines, Steam and Water Power Plants, Transmission Systems, Hotels, Apartments, Office and Industrial Buildings, Railroads.

43 Exchange Place

New York

STONE & WEBSTER

Incorporated

EXAMINATIONS REPORTS APPRAISALS

ON INDUSTRIAL AND PUBLIC SERVICE PROPERTIES

New York

Boston

Chicago

THE BEELER ORGANIZATION

ENGINEERS AND CONSULTANTS

Traction-Traffic-Equipment-Power Investigations

TRANSPORTATION, TRAFFIC, AND OPERATING SURVEYS

COORDINATING SERVICE—FINANCIAL REPORTS

APPRAISALS—MANAGEMENT

52 Vanderbilt Ave.

New York

SANDERSON & PORTER ENGINEERS

PUBLIC UTILITIES & INDUSTRIALS

Design Construction Management
Examinations Reports Valuations

CHICAGO

NEW YORK

SAN FRANCISCO

ENGELHARDT W. HOLST

Consulting Engineer

Appraisals Reports Rates Service Investigation
Studies on Financial and Physical Rehabilitation
Reorganization Operation Management

683 Atlantic Ave., BOSTON, MASS.

ALBERT S. RICHEY

ELECTRIC RAILWAY ENGINEER

WORCESTER, MASSACHUSETTS

REPORTS - APPRAISALS - RATES - OPERATION - SERVICE

KELKER, DELEUW & CO.

CONSULTING ENGINEERS

REPORTS ON

Operating Problems

Valuations

Traffic Surveys

111 W. Washington Street, Chicago, Ill.

C. B. BUCHANAN President W. H. PRICE, JR. Sec'y-Treas. JOHN F. LAYNG Vice-President

BUCHANAN & LAYNG CORPORATION

Engineering and Management, Construction,
Financial Reports, Traffic Surveys
and Equipment Maintenance

BALTIMORE
1904 Citizens National
Bank Bldg.

Phone:
Hanover: 2142

NEW YORK
49 Wall Street

DAY & ZIMMERMANN, INC.

ENGINEERS

DESIGN - CONSTRUCTION - REPORTS

VALUATIONS - MANAGEMENT

NEW YORK

PHILADELPHIA

CHICAGO

HEMPHILL & WELLS

CONSULTING ENGINEERS

Gardner F. Wells

Albert W. Hemphill

APPRAISALS

INVESTIGATIONS COVERING

Reorganization Management Operation Construction

43 Cedar Street, New York City

STEVENS & WOOD

INCORPORATED

ENGINEERS AND CONSTRUCTORS

120 BROADWAY, NEW YORK

ENGINEERING
CONSTRUCTION

YOUNGSTOWN, O.

FINANCING
MANAGEMENT

WALTER JACKSON

Consultant on Fares and Motor Buses

The Weekly and Sunday Pass—Differential
Fares—Ride Selling

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

McCLELLAN & JUNKERSFELD

Incorporated

ENGINEERING AND CONSTRUCTION

Examinations—Reports—Valuations

Transportation Problems—Power Developments

68 Trinity Place, New York

CHICAGO

ST. LOUIS

F. J. BRENNAN

Traffic Analyst, Schedules

588 Park Place

Brooklyn, N. Y.

Byllesby Engineering & Management Corporation

231 S. La Salle Street, Chicago

New York

San Francisco

THE BABCOCK & WILCOX COMPANY

85 LIBERTY STREET, NEW YORK

Builders since 1868 of
Water Tube Boilers
of continuing reliability

Makers of Steam Superheaters
since 1898 and of Chain Grate
Stokers since 1893



BRANCH OFFICES

BOSTON, 49 Federal Street
PHILADELPHIA, Packard Building
PITTSBURGH, Farmers Deposit Bank Building
CLEVELAND, Guardian Building
CHICAGO, Marquette Building
CINCINNATI, Traction Building
ATLANTA, Candler Building
PHOENIX, ARIZ., Heard Building
DALLAS, TEX., 2001 Magnolia Building
HONOLULU, H. T., Castle & Cooke Building
PORTLAND, ORE., 805 Gasco Building

WORKS
Bayonne, N. J.
Barberton, Ohio

BRANCH OFFICES

DETROIT, Ford Building
NEW ORLEANS, 344 Camp Street
HOUSTON, TEXAS, 1011-13 Electric Building
DENVER, 444 Seventeenth Street
SALT LAKE CITY, 405-6 Kearns Building
SAN FRANCISCO, Sheldon Building
LOS ANGELES, 404-6 Central Building
SEATTLE, L. C. Smith Building
HAVANA, CUBA, Calle de Aguiar 104
SAN JUAN, Porto Rico, Royal Bank Building

Transmission Line and Special Crossing Structures, Catenary Bridges

WRITE FOR OUR NEW DESCRIPTIVE CATALOG

ARCHBOLD-BRADY CO.

Engineers and Contractors SYRACUSE, N. Y.

Our advertisement in the issue of October 9th showed how

HASKELITE and PLYMETL

have proved their claims to superiority.

Another full page ad will appear November 6

HASKELITE MANUFACTURING CORPORATION

133 W. Washington St., Chicago, Ill.

THE P. EDWARD WISH SERVICE

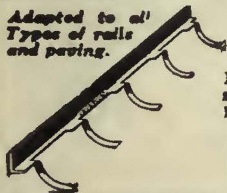
50 Church St. NEW YORK Street Railway Inspection DETECTIVES 131 State St. BOSTON



Better Quality Seats
For Cars and Buses

Hale-Kilburn Co.
1800 Lehigh Ave., Philadelphia, Pa.

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



Adapted to all Types of rails and paving.

GODWIN Steel Paving Guards

Proven by service to economically prevent seepage and disintegration of street railway paving.

Write for Illustrated Catalog No. 88

W. S. GODWIN CO., Inc.
Race and McComas St., Baltimore, Md

Coin Counting and Sorting Machines

FARE BOXES

Lever-Operated and Slip Change Carriers

The Cleveland Fare Box Co.

Cleveland, Ohio
Canadian Cleveland Fare Box Co., Ltd., Preston, Ont.

UNA RAIL BONDS-RAIL JOINTS
DYNAMOTORS
WELDING ROD
UNA Welding & Bonding Co.
Cleveland, Ohio.

Eliminate rail joints
by
THERMIT-WELDING
METAL & THERMIT CORPORATION
120 Broadway, New York City, N. Y.

"Axle Specialist Since 1866"
Address all Mail to Post Office Box 515, Eichmond, Va.

CAR AXLES J. R. JOHNSON AND CO., INC. FORGED STEEL AXLES

For Locomotives, Passenger, Freight and Electric Cars
Smooth Forged or Rough Turned—Carbon or Alloy Steel—Plain or Heat Treated, Forged and Turned Piston Rods, Crank Pins, Large Shafts, Round Bars, etc.

RAILWAY UTILITY COMPANY

CAR COMFORT WITH HEATERS
UTILITY REGULATORS
VENTILATORS

141-151 West 23d St.
Chicago, Ill.

Write for
Catalogue

1328 Broadway
New York, N. Y.

Your Name

in this space in all issues where larger display space is not used backs up your advertising campaign and keeps your name in the alphabetical index.



STUCKI SIDE BEARINGS

A. STUCKI CO.
Oliver Bldg.
Pittsburgh, Pa.

PANTASOTE

Trade Mark

Seat and Curtain Materials
There is no substitute for Pantasote

AGASOTE

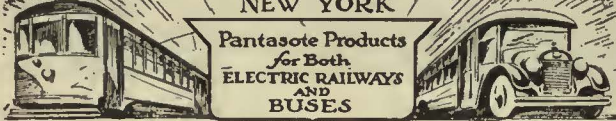
Trade Mark

Roofing—Headlining—Wainscoting
The only homogeneous panel board

*standard
for electric railway cars
and motor buses*

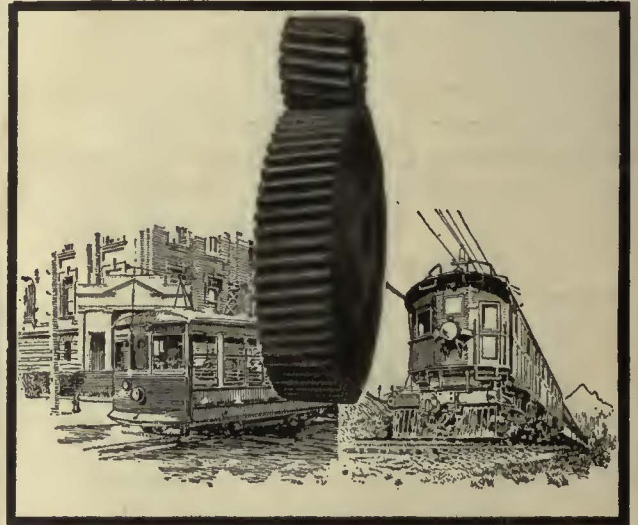
The PANTASOTE COMPANY Inc.

At 46th, 250 Park Avenue Street
NEW YORK



Nine Times Out of Ten

The quality of Electric Traction Service is in direct proportion to the quality of the equipment employed.



If you are not using Nuttall BP Helical Gears and Pinions, you have a way to a vast improvement in your equipment, and an inevitable improvement in your service.

If you are not using the New Nuttall 20-A trolley base you cannot only improve but can perfect that part of your equipment.

Every improvement in equipment brings a corresponding improvement in service, and every improvement in service shows instantly in more dollars and cents.

Let us send you our literature on the two sure money makers.

R.D. NUTTALL COMPANY
PITTSBURGH  PENNSYLVANIA

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railways and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

Nuttall

Whatever your requirements

specify

**Le Carbone Carbon
Brushes**

They talk for themselves

W. J. Jeandron

Hoboken Factory Terminal,
Building F, Fifteenth Street, Hoboken, N. J.

Pittsburgh Office: 634 Wabash Bldg.

Chicago Office: 1657 Monadnock Block

San Francisco Office: 525 Market Street

Canadian Distributors: Lyman Tube & Supply Co., Ltd.
Montreal and Toronto

This company is operating now about 15,000 bus miles per month on the Marlboro Line. We recently put on the most up-to-date bus that money can buy. We hope that you and the members of your family will make use of the service.

For information call Park

**Bus
Schedule for**

**Shrewsbury
Northboro
and
Marlboro**

**Worcester Consolidated Street
Railway Company**

Issued March 31, 1926

“Yellow Coaches”



Operating Cost 22.33 cents per mile



Building up profitable routes with **Yellow Coaches**

The Worcester Consolidated Street Railway Company, at Worcester, Mass., recently faced a problem quite common to many operating companies.

Certain lines were proving unprofitable. There was serious consideration of giving up the trolley and discontinuing any service whatever on one eighteen mile suburban run. Something had to be done, and the solution was found in motor coaches—Yellow Coaches.

Worcester, Mass., operates six 29-passenger Z Type and three Y Parlor Car Coaches, all used on suburban routes, placed there to build up the lines and act as business getters. As a result, former unprofitable lines were strengthened and new patronage induced.

During the first eight months of 1926, the Yellow Coach fleet carried 1,234,000 passengers.



Operating costs 21.08 cents per mile

Z Types show a total revenue of 29 cents per mile and an operating cost of 22.33 cents per mile, broken down as follows—

	Per Mile
Depreciation and maintenance of equipment	8.75
Conducting transportation	7.66
General and miscellaneous	2.81
Gasoline	3.11

The Y types show a total revenue of 31.47 cents per mile and an operating cost of 21.08 cents per mile, broken down as follows—

	Per Mile
Depreciation and maintenance of equipment	8.37
Conducting transportation	2.75
General and miscellaneous	7.10
Gasoline	2.80

As the Company states on the back of their operating schedule—“We recently put on the most up-to-date bus that money can buy”—

And that means Yellow!



Financial stability

It is a tangible asset when you know that the company behind the motor coaches you buy today will be sound financially years from now.

Such assurance means protection against "orphan equipment," the certainty that your money is well invested.

Yellow Coach plus General Motors comes to you with an unusual strength of welded interests. Transportation experience, research, manufacturing facilities, financial standing; all these are ready and waiting to serve you. The result is low-cost, profitable miles.

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

The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

INCORPORATED

CANDLER BLDG. NEW YORK

The DIFFERENTIAL CAR



Standard on
60 Railways for

- Track Maintenance
- Track Construction
- Ash Disposal
- Coal Hauling
- Concrete Materials
- Waste Handling
- Excavated Materials
- Hauling Cross Ties
- Snow Disposal

Use These Labor Savers

- Differential Crane Car
- Clark Concrete Breaker
- Differential Bottom Dump Ballast Car
- Differential Car Wheel Truck and Tractor

THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

S. A. HEGEMAN, Jr., President H. A. HEGEMAN, First Vice-Pres. and Treas.
F. T. SARGENT, Secretary W. C. PETERS, Vice-Pres. Sales and Engineering

National Railway Appliance Co.

Grand Central Terminal, 452 Lexington Ave., Cor. 45th St., New York

BRANCH OFFICES

Munsey Bldg., Washington, D. C. 100 Boylston St., Boston, Mass
Hegeman-Castle Corporation, Railway Exchange Building, Chicago, Ill.

RAILWAY SUPPLIES

- | | |
|---|--|
| Tool Steel Gears and Pinions | Ft. Pitt Spring & Mfg. Co.,
Springs |
| Anglo-American Varnish Co.,
Varnishes, Enamels, etc. | Flaxlinum Insulation |
| National Hand Holds | Anderson Slack Adjusters |
| Genesco Paint Oils | Economy Electric Devices Co.,
Power Saving and Inspection
Meters |
| Dunham Hopper Door Device | Yellow Coach Mfg. Company—
Single and Double-deck Buses |
| Garland Ventilators | |
| Walter Tractor Snow Plows | Feasible Drop Brake Staffs |



Wharton trackwork, in which the famous Tisco Manganese Steel has been used, will be found on the leading railways of the country.

Plant: Easton, Pa.

'CARNEGIE'
for
**WHEELS
AXLES
RAILS
CROSS TIES**



Carnegie Steel Company
PITTSBURGH, PENNA.

**Bethlehem Products for
Electric Railways**

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

Catalog Sent on Request

BETHLEHEM STEEL COMPANY, Bethlehem, Pa.

BETHLEHEM

**Lorain Special Trackwork
Girder Rails**

Electrically Welded Joints

THE LORAIN STEEL COMPANY

Johnstown, Pa.

- Sales Offices:
- | | | | |
|--------------|------------|-----------|----------|
| Atlanta | Chicago | Cleveland | New York |
| Philadelphia | Pittsburgh | Dallas | |
- Pacific Coast Representative:
United States Steel Products Company
Los Angeles Portland San Francisco Seattle
- Export Representative:
United States Steel Products Company, New York, N. Y.

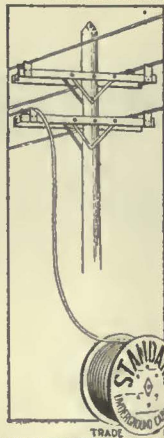
STANDARD

is the trade name for electric wires, cables and cable accessories whose superior quality has been demonstrated by 45 years of successful service.

If you are in the market for wires, cables or cable accessories get STANDARD prices before buying.

**Standard Underground
Cable Co.**

General Offices: Pittsburgh, Pa.
Branches in All Principal Cities.



**MOHAWK
EXTRA**

The master tool steel for milling cutters, boring tools, etc.

LUDLUM
SPECIAL STEELS
LUDLUM STEEL COMPANY

WE HAVE A SPECIAL
TOOL STEEL FOR
EVERY SPECIFIC
PURPOSE

STEELS
SPECIAL PURPOSES
WATERBURY, N.Y. U.S.A.

SEARCHLIGHT SECTION

USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD:

Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.
Positions Vacant and all other classifications, 8 cents a word, minimum charge \$2.00.
Proposals, 40 cents a line an insertion.

INFORMATION:

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.
Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

1 to 3 inches.....\$4.50 an inch
4 to 7 inches..... 4.30 an inch
8 to 14 inches..... 4.10 an inch
Rates for larger spaces, or yearly rates, on request.
In advertising this is measured vertically on one column, 3 columns—30 inches—to a page.

E R J

Over
6000
other
men
in the
Electric
Railway
Field
see this
page—

Then

isn't this the logical place to advertise any business wants you may have of interest to Electric Railway men? Employment—Business—Equipment Opportunities, Etc., Etc.

POSITIONS VACANT

EXPERIENCED young man wanted, competent to take charge of inspection and maintenance of the buses and street cars on a small New England railway property. P-942, Electric Railway Journal, Tenth Ave. at 36th St., New York.

HIGH-GRADE car-house man wanted, to look after maintenance by a small railway property located in New England. P-943, Electric Railway Journal, Tenth Ave. at 36th St., New York.

POSITIONS WANTED

OPERATING man: Capable of taking charge of transportation department of electric railway. Practical experience in each of its branches. Highest of references. PW-944, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

SUPERINTENDENT transportation; wide experience; fine record on city and interurban properties; credited with having built up one of the best groups of trainmen in Middle West and placing property on paying basis. Wishes to make connection with property in need of clean cut, progressive, capable transportation official. PW-940, Electric Railway Journal, Guardian Building, Cleveland, O.

YOUNG man wants position providing an opportunity of learning electric railway practice. Graduate of a co-operative course in electrical engineering. PW-941, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

OFFICIAL PROPOSAL

Bids: Dec. 15.

Car Advertising Space

Honolulu, Hawaii.

Sealed proposals for the leasing of car advertising space in the street cars and buses operated by the Honolulu Rapid Transit Co., Ltd., of Honolulu, Hawaii, will be received at their office, 1133 Alapai Street, Honolulu, T.H., up to 12 o'clock noon, Wednesday, Dec. 15, 1926.

Specifications as to bids may be obtained from the office of the Company, the Electric Railway Journal or Electric Traction.

The company reserves the right to reject any or all bids.

FOR SALE

14 BIRNEY SAFETY CARS

Brill Built

West. 508 or G.E. 264 Motors
Cars Complete—Low Price—Fine Condition

ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Philadelphia, Pa.

Searchlight Results:

Equipment For Sale:

"Our advertisement in the Electric Railway Journal located a buyer, and I have disposed of the car in question."

President—Buffalo Industrial Plant.

"We have disposed of all of our Girder Rails advertised in your paper. We are frank to tell you that the material went to three different traction lines and represents three separate and distinct new accounts. Our idea is that when it comes to bringing something to buyers in the traction field, there is but one sheet, and that is yours."

Dealer—New York City.

"There is no necessity for the continuation of this advertising, for the reason that we could have sold this equipment five times over from the advertisement that was run one time."

Superintendent—A Pennsylvania Railway Co.

Equipment Wanted:

"The two insertions of this advertisement which you displayed in admirable manner were sufficient to obtain for us the exact equipment that we desired."

Superintendent—A New England Railway Co.

Positions Vacant:

"The strongest proof that your Searchlight Department finds its way to many readers is shown by the numerous letters we have received in answer to our recent advertisement."

Secretary—A Connecticut Railway Co.

"You gave us one good man as a result of a similar advertisement in the Electric Railway Journal some time ago. Please give us another."

Proprietor of Steel Sales Agency.

Positions Wanted:

"The result of advertising in the Searchlight Section of your Electric Railway Journal I have secured a position with The ——— Traction Co. of W. Va."

"I received 8 replies and accepted a position with the ——— Railway Co. with over 30% increase in salary."

Business Opportunity:

"Advertisement for investment to develop or acquire Traction Light & Fr. "The results from the advertisement in Electric Railway Journal have been satisfactory."

New York City Attorney.

For Every Business Want: "Think Searchlight First"

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry
with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car
Collier, Inc., Barron G.

Air Brakes
Christensen Air Brake Co.
Westinghouse Air Brake Co.

Anchors, Guy
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools
Columbia Machine Works
Elec. Service Supplies Co.

**Automatic Return Switch
Stands**
Ramapo Ajax Corp.

**Automatic Safety Switch
Stands**
Ramapo Ajax Corp.

Axles
Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
Illinois Steel Co.
Johnson & Co., J. R.
National Ry. Appliance Co.
Westinghouse E. & M. Co.

Axles, Carbon Vanadium
Johnson & Co., J. R.

Axles, Steel
Carnegie Steel Co.
Johnson & Co., J. R.
Ludlum Steel Co.

Babbitt Metal
Johnson & Co., J. R.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co.

Bearings and Bearing Metals
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

**Bearings, Center and Roller
Side**
Columbia Machine Works
Stueckl Co., A.

Bearings, Roller
Timken Roller Bearing Co.

Bells & Buzzers
Consolidated Car Heating Co.

Bells and Gongs
Brill Co., The J. G.
Elec. Service Supplies Co.

Benders, Rail
Railway Trackwork Co.

**Body Material, Haskellite and
Plymet**
Haskellite Mfg. Corp.

Boilers
Babcock & Wilcox Co.

Bolts and Nuts, Track
Illinois Steel Co.

Bond Testers
American Steel & Wire Co.
Electric Service Supplies Co.

Bonding Apparatus
American Steel & Wire Co.
Electric Railway Improvement Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Bonds, Rail
Amer. Steel & Wire Co.
Electric Railway Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

**Brackets and Cross Arms
(See also Poles, Ties,
Posts, Etc.)**
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
American Brake Shoe &
Foundry Co.
Brill Co., The J. G.

**Brakes, Brake Systems and
Brake Parts**
Brill Co., The J. G.
General Electric Co.
National Brake Co.
Westinghouse Tr. Br. Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
Westinghouse E. & M. Co.

Brushholders
Columbia Machine Works

Bulkheads
Haskellite Mfg. Corp.

Bus Seats
Hale-Kilburn Co.

Bus Wheels, Steel
Heywood-Wakefield Co.

Buses, Motor
Brill Co., The J. G.
Yellow Truck & Coach
Mfg. Co.

**Bushings, Case Hardened
and Manganese**
Brill Co., The J. G.
Columbia Machine Works

**Cables (See Wires and
Cables)**

**Cambric Tapes, Yellow and
Black Varnish**
Irvington Varnish & Ins.
Co.

**Carbon Brushes (See
Brushes, Carbon)**

Car Lighting Fixtures
Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heat. Co.
Westinghouse E. & M. Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.

Cars, Gas, Rail
Brill Co., The J. G.

**Cars, Passenger, Freight,
Express, etc.**
American Car Co.
Brill Co., The J. G.
Cincinnati Car Co.
Kuhlman Car Co., G. C.
National Ry. Appliance Co.
Wason Mfg. Co.

**Cars, Second Hand
Electric Equipment Co**

Cars, Self-Propelled
Brill Co., The J. G.
General Electric Co.

**Castings, Gray Iron and
Steel**
American Steel Foundries

**Catchers and Retrievers,
Trolley**
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

Chilling Car
Haskellite Mfg. Corp.
Fantasote Co., Inc.

Chillings, Plywood, Panels
Haskellite Mfg. Corp.

Change Carriers
Cleveland Fare Box Co.
Electric Service Supplies Co.

Circuit-Breakers
General Electric Co.
Westinghouse E. & M. Co.

**Lamps and Connectors for
Wires and Cables**
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Cleaners and Scrapers Track
(See also Snow-Blows,
Sweepers and Brooms)**
Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.

Clusters and Sockets
General Electric Co.

**Coil Banding and Winding
Machines**
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Colls, Armature and Field
General Electric Co.
Westinghouse E. & M. Co.

Colls, Choke and Kieking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Coin Counting Machines
Cleveland Fare Box Co.
International Register Co.

Coin Sorting Machines
Cleveland Fare Box Co.

Coin Wrappers
Cleveland Fare Box Co.

Commutator Slotters
Columbia Machine Works
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
Wood Co., Chas. N.

Commutator Truing Devices
General Electric Co.

Commutators or Parts
Cameron Electrical Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Compressors, Air
General Electric Co.
Westinghouse Tr. Br. Co.

Condensers
General Electric Co.
Westinghouse E. & M. Co.

Condenser Papers
Irvington Varnish & Ins.
Co.

Conduits, Underground
Standard Underground
Cable Co.

Connectors, Solderless
Westinghouse E. & M. Co.

Connectors, Trailer Car
Columbia Machine Works
Consolidated Car Heat. Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Controllers or Parts
General Electric Co.
Westinghouse E. & M. Co.

Controller Regulators
Elec. Service Supplies Co.

Controlling Systems
General Electric Co.
Westinghouse E. & M. Co.

Converters, Rotary
General Electric Co.
Westinghouse E. & M. Co.

Copper Wire
American Brass Co.
Amer. Steel & Wire Co.
Anaconda Copper Mining
Co.

**Copper Wire Instruments,
Measuring, Testing and
Recording**
American Brass Co.
American Steel & Wire Co.
Anaconda Copper Mining Co.

Cord, Bell, Trolley, Register
Amer. Steel & Wire Co.
Brill Co., The J. G.
Elec. Service Supplies Co.
International Register Co.
Roehling's Sons Co.
John A.
Samson Cordage Works

**Cord Connectors and
Couplers**
Elec. Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.

Couplers, Car
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Cranes, Hoists & Lifts
Electric Service Supplies Co.

Cross Arms (See Brackets)

Crossing Foundations
International Steel Tis Co.

Crossings
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Frogs & Switches
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Crossings, Track (See Track
Special Work)**

Crossings, Trolley
Ohio Brass Co.
Westinghouse E. & M. Co.

Curtains and Curtain Fixture
Brill Co., The J. G.
Fantasote Co., Inc.

**Dealer's Machinery & Second
Hand Equipment**
Elec. Equipment Co.

Dealer Second Hand Rails
Electric Equipment Co.

**Derailing Devices (See also
Track Work)**

Derailing Switches
Ramapo Ajax Corp.

Destination Signs
Elec. Service Supplies Co.

Detective Service
Wish-Service, P. Edward

Door Operating Devices
Brill Co., The J. G.
Consolidated Car Heating Co.
National Pneumatic Co.

Doors & Door Fixtures
Brill Co., The J. G.
General Electric Co.
Hale-Kilburn Co.

Doors, Folding Vestibule
National Pneumatic Co.

Drills, Track
Amer. Steel & Wire Co.
Electric Service Supplies Co.
Ohio Brass Co.

Dryers, Sand
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Fars
Columbia Machine Works
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Electric Grinders
Railway Trackwork Co.

Electrical Wires and Cables
Amer. Electrical Works
Amer. Steel & Wire Co.
John A. Roehling's Sons Co.

Electrodes, Carbon
Railway Trackwork Co.
Una Welding & Bonding Co.

Electrodes, Steel
Railway Trackwork Co.
Una Welding & Bonding Co.

**Engineers, Consulting, Con-
tracting and Operating**
Archbold-Brady Co.
Beeler, John A.
Brennan, F. J.
Buchanan & Layng Corp.
Day & Zimmermann, Inc.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLeuw
McClellan & Junkersfeld
Richey, Albert S.
Sanderson & Porter
Stevens & Wood
Stone & Webster
White Eng. Corp., The
J. G.

Engines, Gas, Oil or Steam
Westinghouse E. & M. Co.

Exterior Side Panels
Haskellite Mfg. Corp.

Fare Boxes
Cleveland Fare Box Co.
Nat'l Ry. Appliance Co.
Perey Mfg. Co.

Farr Registers
Electric Service Supplies Co.

**Fences, Woven Wire and
Fence Posts**
Amer. Steel & Wire Co.

Fenders and Wheel Guards
Brill Co., The J. G.
Cincinnati Car Co.
Consolidated Car Fender Co.
Star Brass Works
Wood Co., Chas. N.

Fibre and Fibre Tinting
Westinghouse E. & M. Co.

Field Colls (See Colls)

Flangeway Guards, Steel
Godwin Co., Inc., W. S.

Flaximum Insulators
National Railway Appliance
Co.

Floodlights
Electric Service Supplies Co.

Floor, Sub
Haskellite Mfg. Corp.

Floors
Haskellite Mfg. Corp.

Forgings
Brill Co., The J. G.

Frogs & Crossings, Toe Rail
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Frogs, Track (See Track
Work)**

Frogs, Trolley
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Fuses and Fuse Boxes
Consolidated Car Heating Co.
General Electric Co.
Westinghouse E. & M. Co.

Fuses, Refillable
General Electric Co.

Gaskets
Westinghouse Tr. Br. Co.

Gas-Electric Cars
General Electric Co.
Westinghouse E. & M. Co.

Gas Producers
Westinghouse E. & M. Co.

Gates, Car
Brill Co., The J. G.
Cincinnati Car Co.

Gauges, Oil and Water
Ohio Brass Co.

Gear Blanks
Brill Co., The J. G.

Gear Cases
Chillingworth Mfg. Co.
Electric Service Supplies Co.
Westinghouse E. & M. Co.

Gears and Pinions
Electric Service Supplies Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Nuttall Co., R. D.

Generating Sets, Gas-Electric
General Electric Co.

Generators
General Electric Co.
Westinghouse E. & M. Co.

Gilder Rails
Bethlehem Steel Co.
Lorain Steel Co.

(Continued on page 32)



We make a specialty of
**ELECTRIC RAILWAY
LUBRICATION**

We solicit a test of TULC
on your equipment

The Universal Lubricating Co.

Cleveland, Ohio

Chicago Representatives: Jamieson-Ross Company,
Strauss Bldg.

"The Standard for Rubber Insulation"

**INSULATED WIRES
and CABLES**

"Okonite," "Manson," and Dundee "A" "B" Tapes

Send for Handbook

The Okonite Company

The Okonite-Callender Cable Company, Inc.

Factories, PASSAIC, N. J.

PATERSON, N. J.

Sales Offices: New York Chicago Pittsburgh St. Louis Atlanta
Birmingham San Francisco Los Angeles Seattle

Pattinell-Andrews Co., Boston, Mass.

F. D. Lawrence Electric Co., Cincinnati, O.

Novelty Electric Co., Phila., Pa.

Gen. Rep.: Engineering Materials Limited, Montreal.

Cuban Rep.: Victor G. Mendoza Co., Havana.



Kalamazoo Trolley Wheels

The value of Kalamazoo Trolley Wheels and Harps has been demonstrated by large and small electric railway systems for a period of thirty years. Being exclusive manufacturers, with no other lines to maintain, it is through the high quality of our product that we merit the large patronage we now enjoy. With the assurance that you pay no premium for quality we will appreciate your inquiries.



**THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.**

"POSITIONS WANTED"

is the heading under which many excellent positions have been secured through the

"SEARCHLIGHT SECTION"

MEN! Use these columns for good jobs.

EMPLOYERS! Consult these columns for good men.

4 cents a word. Minimum 75 cents an insertion.

0131

**Arc Weld
Rail Bonds**

AND ALL OTHER TYPES

Descriptive Catalogue Furnished

American Steel & Wire Company

Chicago
New York

Boston
Cleveland

Pittsburgh
Denver

U. S. Steel Products Co.
Los Angeles

Portland

Seattle

San Francisco

THE WORLD'S STANDARD

"IRVINGTON"

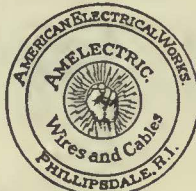
Black and Yellow
Varnished Silk, Varnished Cambric, Varnished Paper

Irr-O-Slot Insulation Flexible Varnished Tubing
Insulating Varnishes and Compounds

Irvington Varnish & Insulator Co.

Irvington, N. J.

Sales Representatives in the Principal Cities



AMELECTRIC PRODUCTS

BARE COPPER WIRE AND CABLE

TROLLEY WIRE

WEATHERPROOF WIRE
AND CABLE

PAPER INSULATED
UNDERGROUND CABLE

MAGNET WIRE

Reg. U. S. Pat. Office

**AMERICAN ELECTRICAL WORKS
PHILLIPSDALE, R. I.**

Boston, 176 Federal; Chicago, 20-32 West Randolph Street;
Cincinnati, Traction Bldg.; New York, 100 E. 42nd St.

ELRECO TUBULAR POLES



THE "WIRE LOCK" THE CHAMFERED JOINT

COMBINE

Lowest Cost
Least Maintenance

Lightest Weight
Greatest Adaptability

Catalog complete with engineering data sent on request.

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO

New York City, 30 Church Street

Northern CEDAR POLES Western

We guarantee all grades of poles; also any butt-treating specifications

BELL LUMBER COMPANY Minneapolis, Minn.

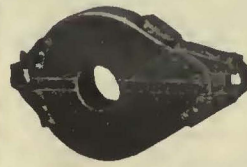


ANACONDA TROLLEY WIRE
 ANACONDA COPPER MINING COMPANY
 THE AMERICAN BRASS COMPANY
 Rods, Wire, Cable Products
 NEW YORK CHICAGO

Chapman Automatic Signals Charles N. Wood Co., Boston



CHILLINGWORTH One-Piece Gear Cases Seamless—Rivetless—Light Weight Best for Service—Durability and Economy. Write Us. Chillingworth Mfg. Co. Jersey City, N. J.



SAMSON SPOT WATERPROOFED TROLLEY CORD



Trade Mark Reg. U. S. Pat. Off. Made of extra quality stock firmly braided and smoothly finished. Carefully inspected and guaranteed free from flaws. Samples and information gladly sent. SAMSON CORDAGE WORKS, BOSTON, MASS.

NAUGLE POLES WESTERN & NORTHERN CEDAR NAUGLE POLE & TIE CO. 59 E. MADISON ST. CHICAGO ILL. New York • Columbus • Kansas City • Spokane • Vancouver • Boston



Car Heating and Ventilation

are two of the winter problems that you must settle without delay. We can show you how to take care of both, with one equipment. Now is the time to get your cars ready for next winter. Write for details.

The Peter Smith Heater Company 6209 Hamilton Ave., Detroit, Mich.

A Single Segment or a Complete Commutator

is turned out with equal care in our shops. The orders we fill differ only in magnitude; small orders command our utmost care and skill just as do large orders. CAMERON quality applies to every coil or segment that we can make, as well as to every commutator we build. That's why so many electric railway men rely absolutely on our name.

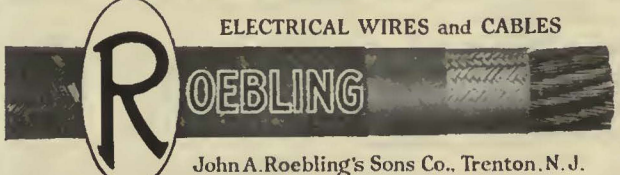
Cameron Electrical Mfg. Co., Ansonia, Connecticut



Gets Every Fare PEREY TURNSTILES or PASSIMETERS

Use them in your Prepayment Areas and Street Cars

Perey Manufacturing Co., Inc. 101 Park Avenue, New York City



ELECTRICAL WIRES and CABLES
ROEBLING
 John A. Roebing's Sons Co., Trenton, N. J.



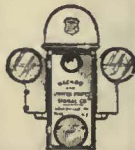
ELECTRIC CAR HEATERS
 THERMOSTATS BUZZERS
 PNEUMATIC DOOR OPERATORS
 CONSOLIDATED CAR HEATING CO.
 NEW YORK ALBANY, N.Y. CHICAGO



BRAZED **ERICO** RAIL BONDS ARC WELD
 Portable Arc Welding Outfits
 The Electric Railway Improvement Co.
 Cleveland, Ohio

NACHOD & UNITED STATES SIGNAL CO., INC.

LOUISVILLE, KY. BLOCK SIGNALS FOR ELECTRIC RAILWAYS HIGHWAY CROSSING SIGNALS



THE BEST TRUSS PLANK ELECTRIC HEATER EVER PRODUCED



No. 478E
 GOLD CAR HEATING & LIGHTING CO., BROOKLYN, N. Y.



SEVEN WORKS
 RAMAPO AJAX CORPORATION
 RAMAPO AUTOMATIC RETURN SWITCH STANDS FOR PASSING SIDINGS TEE RAIL SPECIAL WORK MANGANESE CONSTRUCTION SALES OFFICES AT ALL WORKS Main Office, HILLBURN, N. Y.

H B LIFE GUARDS PROVIDENCE FENDERS

Manufactured by CONSOLIDATED CAR FENDER CO., PROVIDENCE, R. I. General Sales Agents WENDELL & MacDUFFIE CO., 110 E. 42nd St., N. Y. C.

ALPHABETICAL INDEX TO ADVERTISEMENTS

Table with 4 columns: Name, Page, Name, Page. Lists various companies and their page numbers, such as American Brass Co., Kelker, DeLeuw & Co., and Westinghouse E. & M. Co.

Continued from page 32

Continuation of the alphabetical index, listing companies like Turbines, Steam, Welded Rail Joints, and Welding Steel with their respective page numbers.



Type R-11 Double Register

International Registers

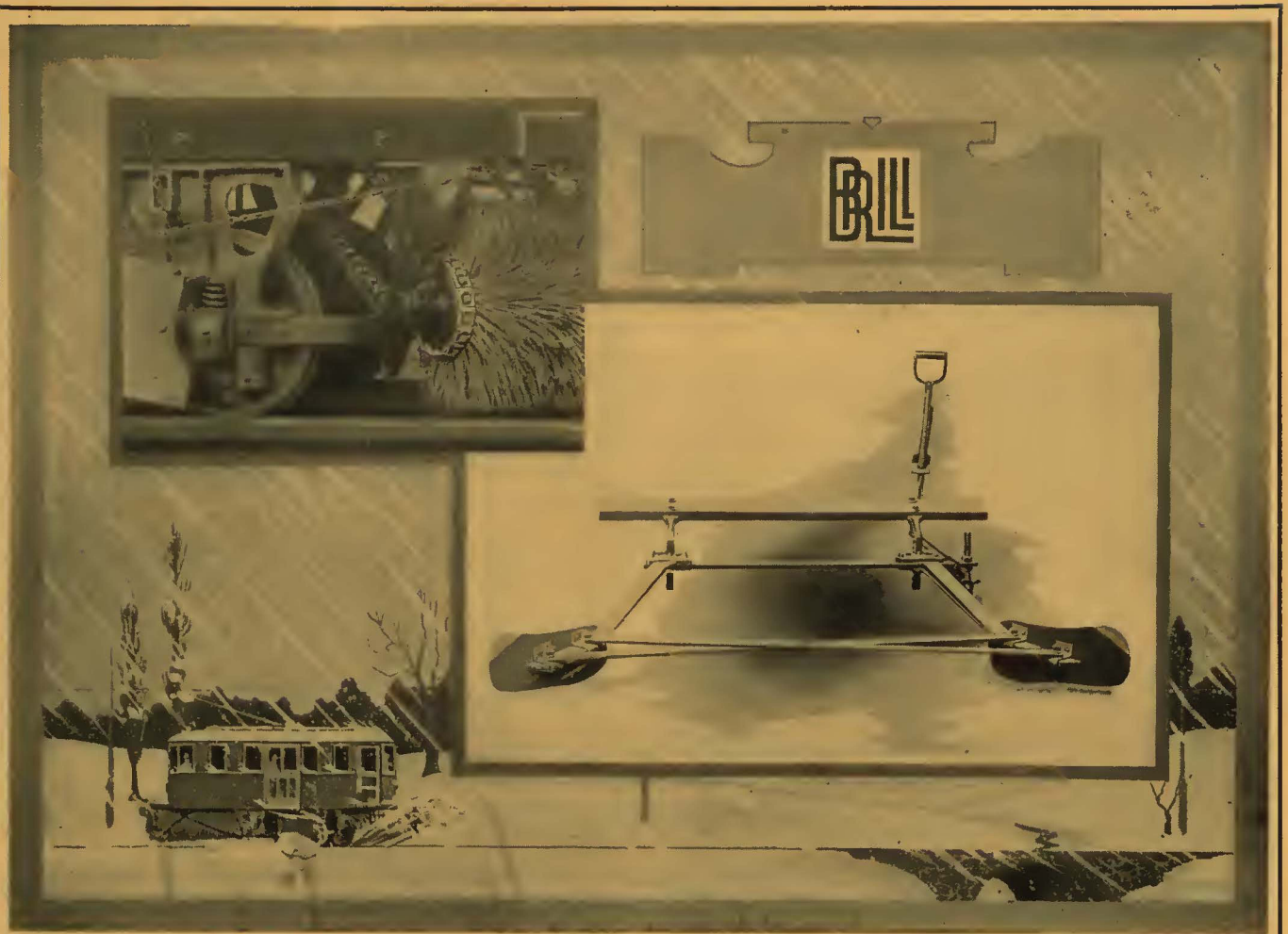
Made in single and double types to meet requirements of service. For hand or foot, mechanical or electric operation. Counters, car fittings, conductors' punches.

The International Register Co. 15 South Throop Street, Chicago, Illinois

Hubbard and COMPANY PITTSBURGH • OAKLAND, CAL • CHICAGO



The Hardware makes the line Hubbard makes the Hardware



B—R—R—R—
 A Reminder—

Requisition
 these Brill Parts

- Snow Sweeper Sprocket Chains
- Snow Sweeper Broom Rattan
- Snow Sweeper Broom Segments
- Snow Sweeper Chain Sprockets
- Snow Sweeper Idler Sprockets
- Snow Sweeper Journal Bearings
- Track Scraper Blades
- Track Scraper Shoes
- Track Scraper Handles
- Track Scraper Springs and Holders

BRILL

Genuine Parts

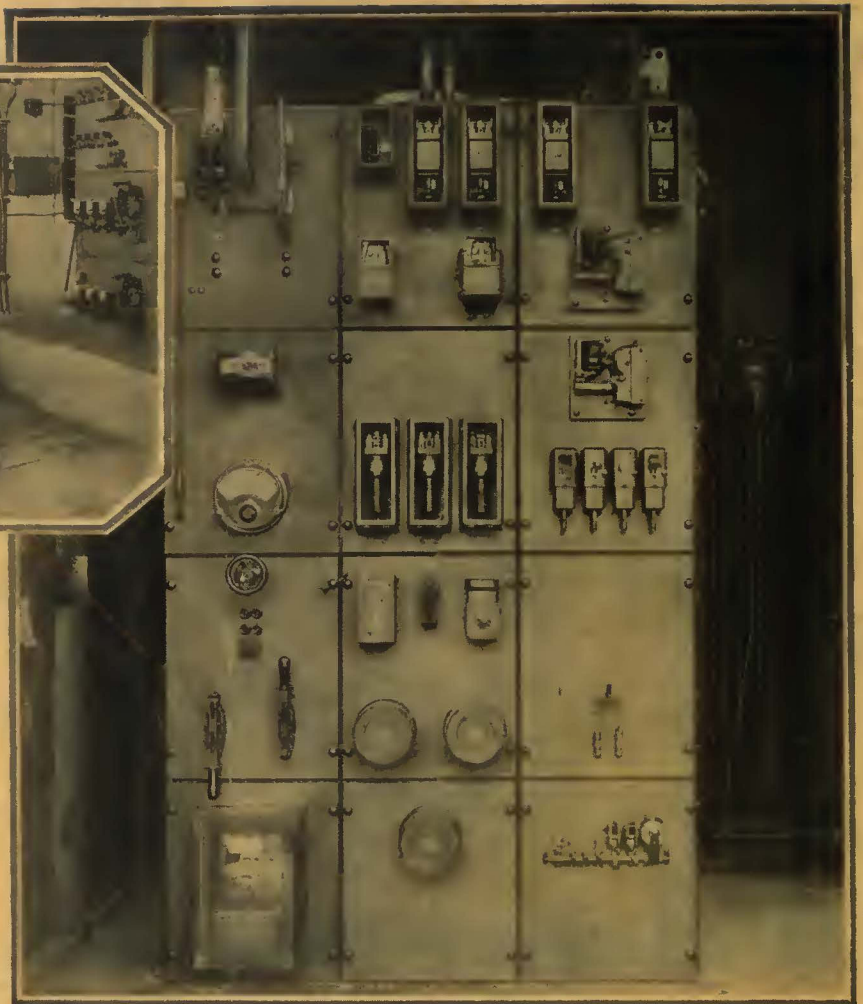
SNOW-FIGHTING EQUIPMENT

With winter approaching, the thought uppermost in everyone's mind is "to be ready." If electric railway service is to go on unhindered, sweepers and plows, as well as track scrapers, must be in "fighting" shape. Genuine parts, of Brill manufacture, for snow-fighting equipment will insure your equipment being in first class shape. Send in your requisition before the heavy snow comes.

 THE J. G. BRILL COMPANY 
 PHILADELPHIA, PA.
 AMERICAN CAR CO. — G.C. KUHLMAN CAR CO. — WASON MANFO CO.
 ST. LOUIS, MO. — CLEVELAND, OHIO. — SPRINGFIELD, MASS.



1200-volt G-E Automatic Substation, Oregon Electric Railway.



Saves thousands

The average saving effected the first year by *each* of the seven G-E Automatic Substations on the Oregon Electric Railway was \$5176.12—a total of \$36,232.

Of this, 91% was saved through reduced operating and maintenance costs; the remainder by a reduction in power consumption because of the more efficient operation with automatic control.

G-E Automatics were adopted by this road on account of its unusual conditions—heavy trains and infrequent service. The unqualified success of these equipments is pointed to in the company's statement that "so far as trouble is concerned, one would not know there are substations on the system".



Throughout the world, more than 300 G-E Automatic Substations in the service of 87 railways, steam and electric, are proving their value by giving economic and schedule-maintaining service. May we send you our Bulletin, No. GEA-90A? It gives a list of users in all fields.

GENERAL ELECTRIC