ELECTRIC RAILWAY JOURNAL

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Consolidation of
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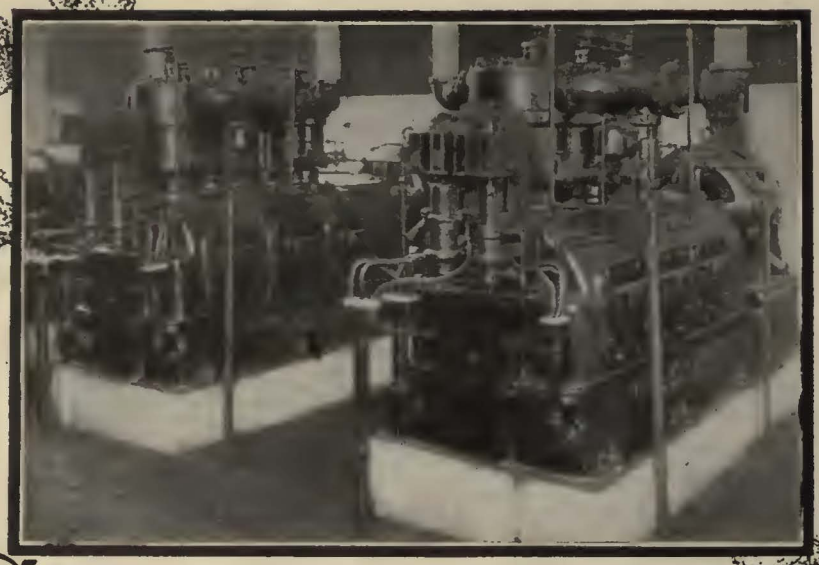
Contents of This Issue

DECEMBER, 1931



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JUST as the old-time baker threw in an extra bun for good measure, so the builders of Westinghouse-National Air Compressors add extra value to the machines they build . . . They save valuable space for the user by designing compact machines that are driven direct by the motor or through efficient herringbone gearing . . . they save installation cost by making complete self-contained machines that need no elaborate foundation nor require extensive auxiliary apparatus . . . they save operating expense by providing complete Automatic Control of distinctive type—which insures that the power consumed will be in proportion to the air compressed . . . they save maintenance expense by building durable machines that will operate for a score of years with minimum time and material for attention and upkeep—thus maintaining the noteworthy tradition of "Quality Machines for Quality Service" . . . Sizes range from 2½ to 700 cu. ft. displacement—for power house, car barn, or shop . . .

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WESTINGHOUSE-
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Air Compressors

N. P. Treadles . . . . . .

A paying investment for Third Avenue Railway of New York

Third Avenue Railway

Reports total combined net income on railway and bus operations of $291,426 for twelve months ended June 30, compared with a net loss of $199,460 for the preceding twelve months, while total operating revenues were $16,876,140, a decrease of $742,434. Earnings in the railway division decreased $1,032,987, while those of the bus division increased $290,553. Operating expenses were $12,867,490, a decrease of $1,220,827, with the railway department's costs decreasing $1,158,468 and the bus expenses falling off $62,358.

Reprinted from the financial page of the New York Herald-Tribune of July 29th.

Third Avenue's Good Showing

In discussing in a recent issue the prospects for Third Avenue Railway, New York, refunding 4's, 1960, the *Wall Street Journal* said that increases in net income reported by the Third Avenue Railway have been recorded in the face of a decrease in gross revenue. Conversion of two-man into one-man cars has enabled the company to strengthen its profit base. Expenses have been reduced in line with the decrease in gross so that practically all of the saving accruing through one-man operation of cars has been added to net. Cost of converting the cars for the new system of operation has been charged to current expenses; when this work is completed, there should be further savings in expenses, assuming continued control over other operating costs. Substitution of buses for trolley cars, at a 10-cent fare instead of 5 cents, increase in number of lines operated and reduction in per-mile costs have converted a loss from the bus division into a profit. The company estimated that bus costs have been reduced 4 cents a mile, and that receipts have been increased 1 cent a mile operated. Expenditures for plant and equipment have not been restricted.

Reprinted from Electric Railway Journal News of Oct. 24, 1931.

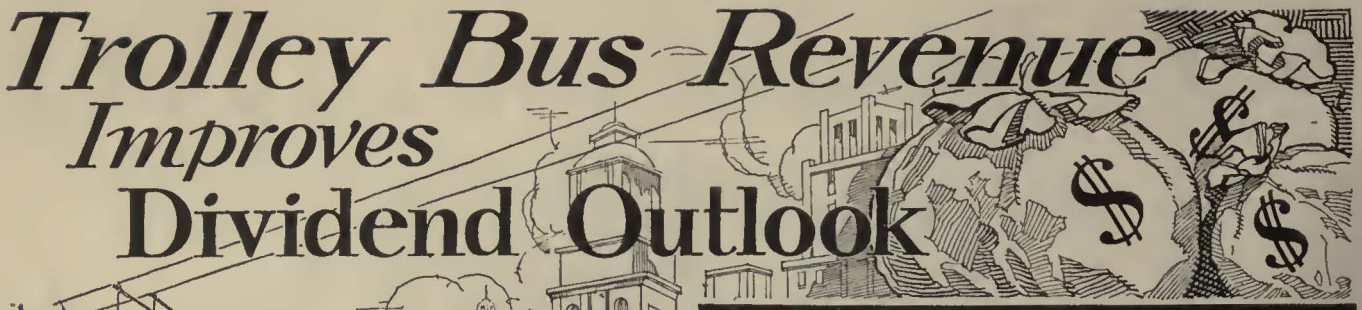
The Third Avenue Railway of New York turned a serious deficit into a substantial profit by remodeling their two-man cars for one-man operation.

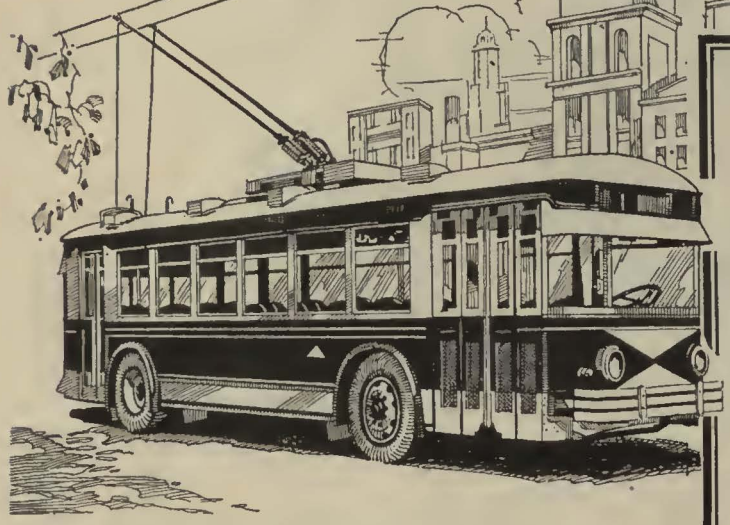
These cars maintain satisfactory schedules *safely*, because N. P. Automatic Treadles guard the rear exit doors.

Write for details.

NATIONAL PNEUMATIC COMPANY

Trolley Bus Revenue Improves Dividend Outlook





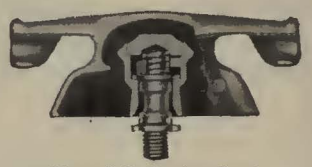
ELECTRIC railway operators are quickly perceiving and utilizing the profit possibilities of the trolley bus. Intelligent investments are being made in this swift, comfortable method of transportation. Evidence of the wisdom of such judgment is to be found in the favorable revenue reports of existing lines.

Naturally a portion of this revenue must be set aside for normal maintenance. Yet, the ultimate worth of the trolley bus will be judged by the amount which may be conserved for dividends on the investments rather than for abnormal maintenance and replacement expense. A problem which, no doubt, accounts for the care which is being used in the initial selection of materials for new systems.

Realizing the importance of this problem, O-B overhead equipment and bus accessories have been designed and are manufactured to give just a little longer and just a little better service than is the normal expectation. Reason why, perhaps, the O-B trademark is so much in evidence on existing systems. Reason, too, why users of O-B materials conserve more and more for dividends and need to devote less and less to overhead and bus accessory maintenance.

Perhaps you may be ready to discuss proposed trolley bus installations with your O-B repretative. Likewise, publication 403G is filled with valuable information on this subject and will gladly be sent upon request to:

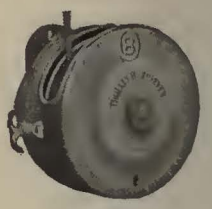
O-B Tapered Side Marathon Ear



New O-B Spring Lock Trolley Bus Hanger

New O-B Spring Frog

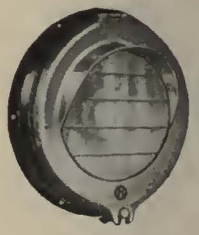
Improved O-B Swivel Harp and Shoe



O-B Trolley Retriever

O-B Type T-2 Trolley Bus Crossover

O-B Form 5 Six Spring Trolley Base



Type CZF Trolley Bus Headlight

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up the paving . . .

Track like this doesn't have to be opened up, the joints are

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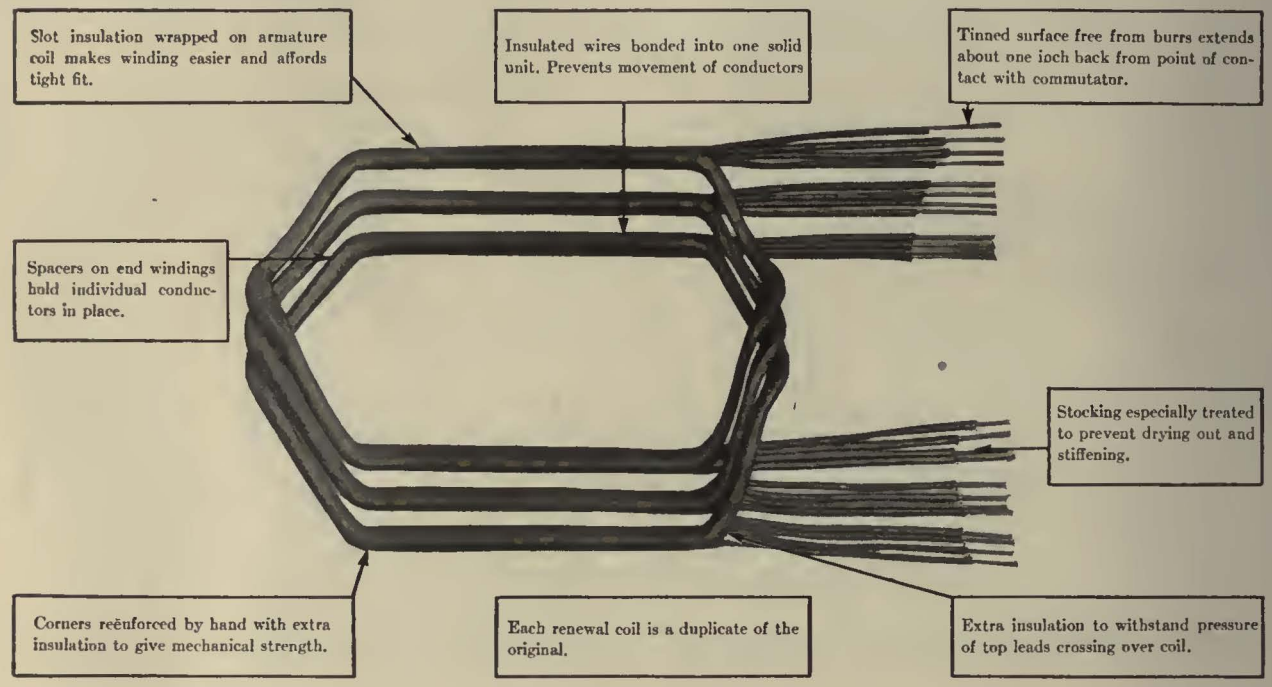

SNOW-PACKED RAILS are tough on motors. Such conditions frequently cause spinning wheels, overheated motors, and burned-out coils. In winter or summer, it is always the safe policy to use G-E armature coils in G-E motors. G-E coils withstand heat. And they are built to fit the armature slots correctly—just right to make winding easy—just right to prevent injurious abrasion in the heat of cold-weather operation. The quality of G-E renewal coils is the same as that of the original equipment. It is a requisite of economical maintenance.

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GENERAL ELECTRIC

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

Electric Railway Journal

New York.
December, 1931

Consolidation of
Street Railway Journal and Electric Railway Review
Established 1884—McGraw-Hill Publishing Company, Inc.

John A. Miller, *Editor*

Volume 75
Number 13

A Broader Name *for a* Broader Field

CHANGES of tremendous significance have taken place in the field of community transportation during recent years. Not so long ago the electric railway was practically the only public means of urban and interurban transportation. Today the situation is very different. The electric railway is still a vital element in community transportation, but it is not the only element. It has been supplemented by the motor bus, the trolley bus and the taxicab. A great many electric railways have adopted one or more of these newer services to supplement that of their rail lines.

Thus the term "electric railway industry" no longer indicates the actual scope of the business of furnishing community transportation. Similarly, the name Electric Railway Journal falls short of defining the present broad field of this publication. As both the industry and the Journal have widened their scope and removed artificial limitations, so both have outgrown their old names. After careful consideration of all phases of the situation, the publishers of the Journal have come to the conclusion that the paper can better serve the needs of the industry by adopting a broader name — one which will more accurately reflect the actual content of the publication. At the beginning of the new year, therefore, the name of Electric Railway Journal will be changed to Transit Journal.

The word "transit" has been associated with the activities of the industry since its earliest days. It has long been a part of the corporate name of many operating companies. At the same time it is a thoroughly modern word. During recent years numerous companies have substituted "transit" for "electric railway" in their names to indicate the broader field of their activities. No other word so well describes the tremendously important business of furnishing public transportation in our cities and adjacent areas. Electric street railways, subways, elevated railways, motor buses, trolley buses, taxicabs, interurban electric lines and electrified suburban railroad service, all are included within the scope of the word "transit."

Adoption of the name Transit Journal with the issue of January, 1932, will mark the second change in title since this paper was founded in 1884 as the Street Railway Journal. At that time the only public means of community transportation was the horse-drawn street car. During the next two decades the electric railway was developed and proved so successful that it replaced the horse car everywhere. In 1908 the Street Railway Journal was merged with the *Electric Railway Review* under the name of Electric Railway Journal. In announcing that change, the paper stated that "It is thought that the new name recognizes better than the old the existing and future condition of the industry we represent."

It is for essentially the same reason that a second change is now desirable. The industry is no longer concerned only with one particular form of transportation. It is interested in all forms of community transit. Especially is it interested in the proper co-ordination of the various forms of transportation. So also is the Journal. Adoption of the name Transit Journal "recognizes better . . . the conditions of the industry we represent" and emphasizes the fact that all forms of community transit constitute a single industry.

Beginning with the issue of January, 1932, the name of

Electric Railway Journal

will be changed to

TRANSIT JOURNAL

Public Transportation—City, Suburban and Interurban

Tax Relief a Real Need

TAXED to death—those are the words of the board of arbitration in the recent St. Louis wage case, referring to the payment of 1 cent out of every 10-cent fare for taxes by the St. Louis Public Service Company. "A 10 per cent levy on gross revenues is a burden seldom experienced in business, and amounts almost to an exaction," said the board. On top of that, it pointed out, is the cost of paving and its repair required in the franchise, and the expense for tearing up track and relocating it whenever street improvements make such changes necessary.

It is highly significant that a board such as this, which was composed of disinterested members, should pause to point out one of the fundamental difficulties which public transportation has to face. St. Louis is not alone in heavily taxing its transit system. Tax assessors, politically minded, are always ready to lighten the burden of the common people at the expense of the utilities. Imposts vary with the locality and the ingenuity of the authorities in devising forms of taxation. The paving burden is perhaps the most usual, but there are many others. Some properties are taxed for street lights along the right-of-way. Some maintain schools. And then there is the famous Baltimore park tax, by which the United Railways for more than 70 years has provided for maintaining the city's parks. It now costs the car riders more than $1,000,000 a year.

In times of plenty the general belief is that the company is making so much money that taxes of this sort do not constitute a heavy burden. In years of adversity other sources of revenue have dried up, and so no relief will be considered. The only way to combat such ideas is to present the whole matter to the public forcefully and plainly, and as often as possible. It is only by such methods that an improvement in the taxation situation ever will be brought about.

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Over-Manning Not a Solution of the Unemployment Problem

MANY are the suggestions being advanced in these days to relieve unemployment by hiring additional workers regardless of any actual need for their services. The peculiar thing about these proposals is that they invariably contemplate having someone else pay the wages of these additional workers.

One of the favorite suggestions of this kind is that the electric railways should be compelled to employ two men on their present one-man cars. This step is urged, not because of the need for an extra man, but simply to give jobs to some of the unemployed. No doubt this would be accomplished to a certain extent, but why be content with two men per car? If the purpose is merely to create "jobs," why not require three or even four men per car? For that matter, why not require two men on every motor truck and that the owner of every private automobile employ a chauffeur? The latter requirements would do more to relieve unemployment than placing a second man on every electric car. Unfortunately, however, the problem is far more complex than merely finding something for the unemployed to do. The crux of the problem is to find the money to pay wages to more workers.

It is always easy to suggest ways for other people to spend their money. This is particularly true in respect to the electric railways since their operations are subject to close regulation. Moreover, the old-fashioned idea still prevails to some extent that transportation companies must necessarily be wealthy because they take in a lot of money. The fact that they also spend a lot of money is overlooked. Indeed the local transportation industry faces an even more difficult problem than most other industries in earning an income adequate to cover its expenses. Dividends have disappeared entirely in many instances and have been cut almost to the vanishing point in others. Where the money could be obtained to pay the wages of any extra employees is difficult to say.

The industry is not unmindful of the seriousness of the unemployment problem. Since the beginning of the present business depression, the local transportation companies have made a creditable record in keeping nearly all their employees on the payrolls. But they are not charitable institutions. They cannot reasonably be expected to employ additional men whose services are not needed. Moreover, it may well be doubted that the employment of two men to do the work of one is a sound policy at any time.

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Actions Speak Louder Than Words

MUCH has been spoken and written in recent months about the kind of service and the fare structure that will attract riders to public transportation vehicles. Committees have been appointed to attack the various phases of the problem. Figures have been prepared to show what can be accomplished by modernization of plant and methods. But managements in general have been inclined to wait and defer the definite action that might be expected to bring increased receipts at lower operating expense.

In sharp contrast with this attitude is that of the management of the Philadelphia & Western Railway. Upon assuming control of the property some two years ago, a careful study was made of the plant, the service and the fare structure. First of all it was evident that the existing fares did not attract regular riders. A new set of rates, both for single trips and for commuters, was put in effect a year ago. It also was evident that traffic was being lost to the competing electrified railroads by virtue of their faster time between the territory served and the center of Philadelphia. Although the principal line of the P.&W. is only 14 miles long, with many sharp curves and heavy grades, it was decided to obtain new

cars with which the running time could be substantially reduced.

It would have been possible to buy heavy cars of the conventional type to do the work, but the power requirements would have been prohibitive. So a series of experiments was conducted to determine the best type of car. It was found that a car could be built largely of aluminum, and with a new type of truck and careful streamlining, the power demand could be held to little more than half of that of a conventional car for similar speeds. It took courage to build cars of the radical design indicated, but the decision was made without hesitation.

Other steps that were taken in the modernization were the construction of a new terminal building at Norristown, the reconstruction of cars which could be used for local service with fast schedules, and reconstruction of the track to permit cars to run at the high speeds. All told, the company has spent a half-million dollars in the rehabilitation.

If the reception which was given to the opening of the terminal and the start of the new service last month is an indication, it will mark the beginning of prosperity for the railway. While others are awaiting the results, the owners of the Philadelphia & Western will be obtaining them.

Somewhat different is the situation confronting the Capital Traction Company. Besides the shrinkage in business which nearly every transit line has had to face, unregulated cheap taxicabs have been allowed to run riot in Washington. They have caused the local lines to sustain severe losses during recent months. If allowed to continue they will threaten the existence of organized transportation in the city. But in this instance, too, the management is convinced that the public will in the long run play fair. Accordingly, it is going ahead with the purchase of new cars which will cost more than a half million dollars, and intends to adopt as modern a design as the status of the art will permit.

In both these instances the raising of new money shows a moral courage and aggressiveness that may be taken as an example by others with similar problems. In both of them actions speak louder than words.

▼

The New Aristocrat of Labor

CHARACTER rather than financial standing was the criterion by which a famous financier was accustomed to appraise prospective borrowers, and it is said that he suffered few losses. In a somewhat similar way tenure of office rather than temporary earning power due to high wages is now being used as a basis of credit appraisal. The man with a steady job has become the new aristocrat of labor replacing the former aristocracy of the trowel, the hammer and the shovel, who received fabulous wages a few years ago. Worthy though these artisans are, their former wages reflected the effect of certain post-war conditions rather than the actual value of their services to society. In those boom times, sight was lost of other artisans equally needed in the scheme of civilization such as the employees of the electric railway and public utility companies. From the standpoint of wages, these utility workers were less fortunate than those in other lines, but they enjoyed a highly desirable tenure of office. This is now in the process of being rediscovered. As unemployment has increased in many trades, the utility employee has taken on a new dignity among those who labor.

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Legal Status of the Trolley Bus Becoming More Clearly Defined

CLASSIFICATION of the trolley bus as a street car for the purpose of legislation and taxation has already received legal sanction in several States, and indications are that others will follow suit. The reasons for this classification are obvious. In every instance to date, trolley buses have been installed by an electric railway company, and their operation is controlled by a franchise wherein compensation for street use is fixed. To impose further fees or taxes upon them would be manifestly inequitable.

Moreover, if the trolley bus were to be classified as a highway vehicle like the gasoline bus, it would be restricted in design as to length and width. Highway vehicles as a class are limited to a maximum width of 8 ft., while street cars are usually built wider, some of them as wide as 9 ft. Classification of a trolley bus as a street car permits it to be built 9 ft. wide, thus giving an additional foot of width to be used for wider aisles without sacrificing seat space. This factor is important. The wider aisles permit freer circulation of passengers. The advantages of the trolley bus in fast acceleration and braking, permitting of fast schedules, would be largely destroyed if the vehicle were unduly restricted in width, and the movement of passengers correspondingly hampered.

Since the trolley bus operates on a fixed route, there is no possibility of its finding its way onto the open highways where limitation of vehicle width may be desirable. It is on this basis that the classification of the trolley bus as a street car has been adopted in a number of States. In Illinois a new law became effective on July 1, classifying trolley buses as street cars by amending the existing law which excluded from the definition of motor vehicle all "cars of electric and steam railways and other motor vehicles running only upon fixed rails or tracks." To this exemption was added the classification "or propelled by electric power obtained from overhead trolley wires." Similarly, in Wisconsin legislation has been passed which puts the trolley bus definitely in the same category as the street car on the basis that it is a vehicle operated by means of fixed surface or overhead structures. With these examples to establish the precedent, it may be expected that other States will fall in line by adopting the same classification policy.

Building Public Good Will

By

JOHN J. CORNWELL

General Counsel
and Chairman Central Committee on Public Relations
Baltimore & Ohio Railroad

As Told to PAUL WOOTON

QUALITY is essential in any product. Transportation is no exception. But if a business is to be successful, other factors are necessary in addition to quality, more necessary in this era of sharp competition and discriminating judgment on the part of the public than ever before. Besides quality there must be salesmanship. An article of splendid quality may lie long unsold unless something is done to call attention to its merit. It is particularly important that courtesy and good taste be used in calling attention to the quality of the article for sale. Transportation in this respect is the same as goods on the shelf. A superior commodity or a superior service must be proffered in a polite and agreeable manner. The service alone does not sell itself.

The public service corporation, publicly regulated, is just now more carefully scrutinized and more critically observed by the public, in so far as its methods and its products are concerned, than other corporations or concerns. Especially is this true of transportation companies—steam and electric railroads—because of the new and competitive freight and passenger transportation on waterways, highways and in the air. This is now generally recognized but it was not always so.

Because of this, good public relations are essential. The Baltimore & Ohio Railroad was one of the pioneers in this field. More than a score of years ago when Daniel Willard came to the company as president, in addressing the first general staff meeting, he proclaimed what we know as his "good neighbor" policy, declaring that he wanted the company to be a "good neighbor." It is not practicable to define the things the company or its agents and employees must do to be a good neighbor. Too many unforeseen and unexpected things happen in connection with the operation of a great railroad system to undertake to fix formulas for handling all of them. It does imply fair dealing, good service and courteous treatment.

Naturally, the habits and state of mind of many thousands of people can not be altered or remade over night, and the viewpoints of railroad officers and employees twenty years ago were not what they are today. However, the seed planted in the organization then took root and grew, and we of the company like to believe that today it is imbued from top to bottom with the good-neighbor spirit.

Elbert Hubbard often quoted Ralph Waldo Emerson as having said: "Every great institution is the lengthened shadow of one man." Whether Emerson said it or not, it is true, and the modern Baltimore & Ohio is the lengthened shadow of Daniel Willard.

If the man at the top is a grouch, if he is surly and severe, grouchiness and surliness will permeate the organization from top to bottom. If the "Chief" is fair, frank, friendly and courteous, it will be known from the highest to the lowest, and, while not every employee can "change his spots," it is a powerful incentive for the propagation and cultivation of the same spirit to all who make up the organization.

So, into the Baltimore & Ohio there came the co-operative plan, whereby men and management confer for the purpose of devising better methods and promoting greater efficiency. Up to date, nearly 100,000 suggestions have been made by men in the shops, on the trains and in the offices. All of them received consideration and a majority were adopted.

Each craft has its committee. These committees sit down with the management and all suggestions from the men are weighed. When it is the consensus of opinion that they have merit they are tried out. An example of one of these suggestions which has resulted in large economies is the so-called spot system. Under that plan cars to be repaired are moved along from spot to spot where particular tools and particular materials are assembled. Formerly it was the practice in repairing cars to carry all the materials and all of the tools needed to the car. Under the spot plan many of the economies of the assembly line of the automobile plant are secured.

In 1923 there were established committees on public relations, a central committee in the general offices in Baltimore, with a representative from each of the several departments, and functioning under it a local committee in practically each of the counties of the several States through which the company's lines run. These committees interpret the management's policies to the public and the public viewpoint to the management. They are points of contact. They aid in solving local problems, clear up or prevent misunderstandings and assist in making the Baltimore & Ohio a good neighbor.

These committees also perform a highly important function in acquainting the public with the railroad's point of view. They were particularly helpful in 1923. At that time the railroads just had come through the shopmen's strike and had not had an opportunity to rehabilitate their properties after the wear and tear experienced during the World War and government operation. Railroad executives realized that the country was on the threshhold of a period of business expansion. That meant that the railroads had to be put into condition to handle a large amount of traffic. To do so it was

found that an investment of $1,100,000,000 would be required.

At that time there was fear that Congress would eliminate Section 15a from the Transportation Act, which directs the Interstate Commerce Commission to establish rates which will yield a fair return on the value of railroad properties. It was realized the necessary capital could not be raised unless the investing public were convinced that Section 15a would remain in the law. The public relations committees set out to do their share of the explaining to the public that this clause must be retained if the railroads were to be rehabilitated promptly.

As a result of the explanation of the situation to the public, made by these committees and the various other railroads, each railroad proceeding in its own way, Congress realized that the majority of the people favored the retention of the clause. This was reflected in Congress by the increasing opposition to proposed amendments, with the result that Section 15a was retained. The necessary capital soon was forthcoming which put the railroads of the country in a position to meet the unusual demand for transportation which had been foreseen by the executives.

The central committee in the general offices in Baltimore is composed of six officials, each representing one of the executive departments. That committee, in turn, created the local committees. For the most part those committees are made up of local freight and passenger agents, local counsel, local surgeons and local operating men. These local committees form points of contact with the public. They are ready at all times to hear complaints or suggestions for improving the service.

With the good-neighbor spirit at the top; with it carried along the line; with a public understanding and appreciation of that spirit, naturally the Baltimore & Ohio agents and employees are loyal to and enthusiastic in their work. In the files of every officer are countless letters of appreciation from passengers and shippers, recounting their experiences and telling of special services rendered by employees.

Passengers on Baltimore & Ohio trains are guests not only of the company, but of the men handling the trains. The men not only know that but actually they feel it. They know how a guest should be treated. They do not have to be told. It is instinctive with them. The train crews make every effort to analyze the requirements of each individual passenger. They are careful not to annoy the sophisticated person who might resent their efforts to please, but are more than ready to supply interesting facts about the country through which the train is passing to those who may be making the trip for the first time. A courteous attitude is a requisite for every employee who comes in contact with the public. You know the old story of the office manager who came to the office one morning with a grouch. He assailed his assistant who, in turn, took it out on the next in rank and so on down the line to the office boy who finally landed in the cellar and kicked the cat.

The Baltimore & Ohio does not propagandize its employees, the press or the public. The management believes in a frank and open method of dealing with all three groups. The men down the line know the management's policy. It has been a matter of growth, development and contact.

Information is given the press—not write-ups or stories with advertising value, but information which newspapers may use if they think it is of value to them. The company is a liberal purchaser of advertising space. It does not expect the newspapers to be just as active in getting the railroad's side of the story as they are in securing the other side which may be more sensational or have more news value.

The management believes that lobbying, as known in the old days, is and should be a thing of the past. We think the public is fair, even to a public service corporation, when the public correctly understands the situation. We further think not only that we have a right, but that it is our duty to present to the public the facts as we get and see them, having faith that we will get a fair deal if the facts are properly presented.

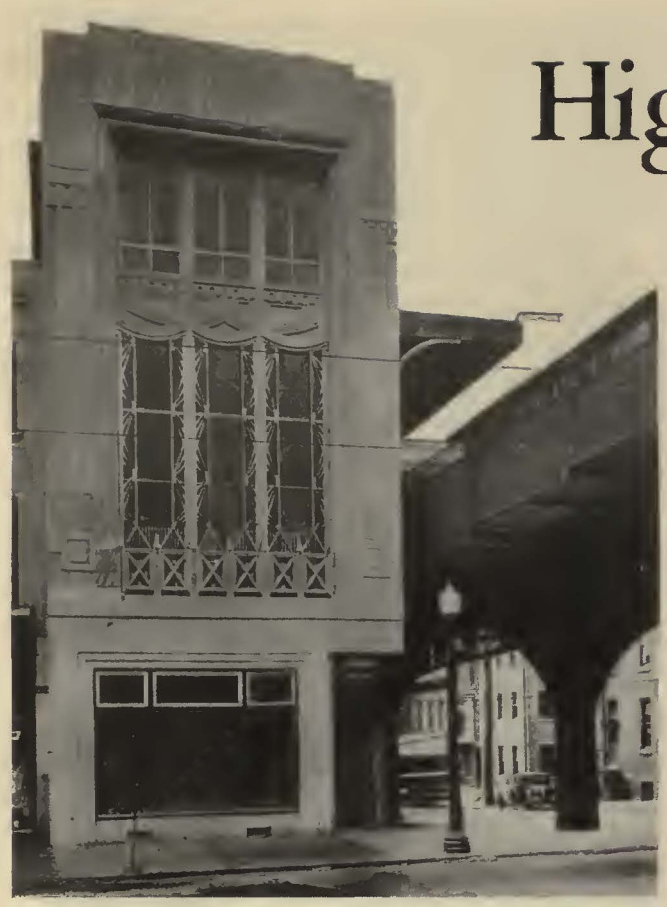
John J. Cornwell

FOR more than 30 years, John J. Cornwell has been a member of the legal staff of the Baltimore & Ohio Railroad. At present he is general counsel and chairman of the Central Committee on Public Relations. His experience has not been confined to the field of transportation, however, but includes much time devoted to public service. He has served at various times in the Legislature of his State, and was a delegate to several Democratic national conventions. During the years 1917 to 1921 he served as Governor of West Virginia. It was Governor Cornwell who drafted the original resolution creating the committees on public relations of the Baltimore & Ohio. In this article he gives an extremely interesting outline of the policies which the company has followed with notable success in building public good will.

This is the ninth of a series of articles by prominent men outside the electric railway industry expressing their views on transportation subjects.

High-Speed Service

PHILADELPHIA



Main Street Façade of the New Norristown Terminal

The elevated footwalk, leading to the second (or waiting room) floor of the terminal, is shown at the extreme right

WITH the dedication of its new Norristown terminal on Nov. 14 and commencement of high-speed service with its new cars the following day, the Philadelphia & Western Railway ushered in a new era in its existence. It follows a program of physical and service betterments that has been going forward for the past two years. Besides the construction of the terminal and cars, the new management, under the leadership of Dr. Thomas Conway, Jr., has made many improvements to the plant, and has completely revamped the fare structure. The dedication and inspection of the new facilities were attended by more than 10,000 residents of the territory served and many sightseers rode the new cars the following day.

The new Norristown terminal is an attractive building of reinforced concrete and steel construction, modernistic in design. The Main Street façade is of sandstone, while the Swede Street exterior is of sandstone and brick. Immediately adjacent to the terminal is the elevated structure by which the trains enter Norristown, to which access is had by an elevated platform constructed as a part of the building.

The large windows on the Main Street side of the waiting room, as well as the third floor of the terminal, are set in a polished aluminum framework which is in large measure responsible for the attractiveness of the building. The first, or street, floor is given up to the Terminal Grille and other concessions. The equipment installed is of the latest design, and the treatment of the interior is artistic. On this floor are a soda fountain, cigar stand, candy counter and news stand, luncheon booths, telephone booths, individual parcel checking facilities, an order desk for a cleaning and dyeing establishment, and a modern barber shop.

Waiting Room Like a Club Lounge

The entire second floor is devoted to the waiting room, ticket offices and restrooms. It is reached by an easy, attractive stairway, and by the latest type self-leveling automatic elevator. The waiting room is distinctive. Instead of the conventional hard wooden benches, it is furnished with easy chairs and divans, attractively grouped as in a club lounge. This furniture is covered with green and taupe leather. The waiting room is wainscoted, and the wall surface above is given a special mottled buff plaster finish. The lighting fixtures are modernistic and are unusually attractive.

For the convenience of Norristown patrons north of Main Street, a practically level elevated footwalk was constructed from grade at Penn Street to the waiting room. It permits patrons to cross Main Street without encountering the hazards incident to crossing at grade, and obviates the necessity for step climbing.

The third floor will be utilized for company offices. While not elaborate, the new offices are attractive and well lighted, and will afford much better working conditions than have been available.

Philadelphia & Western's new cars are designed for operation either as single units or in trains. To understand the problems involved in the design of this equipment, it is necessary to know something of the conditions of service under which these cars are operated.

At the eastern, or city, end of the Philadelphia & Western is the 69th Street Terminal used jointly with the Philadelphia & West Chester Traction Company and the Market Street Elevated-Subway line of the Philadelphia Rapid Transit Company. At this point Philadelphia & Western passengers transfer to the elevated-subway line.

The lines of the Philadelphia & Western extend from the 69th Street terminal 11 miles to Strafford, serving suburban communities along the main line of the Pennsylvania Railroad; and to Norristown, in the Schuylkill Valley (14 miles), served also by the electric suburban service of the Pennsylvania and by the steam suburban service of the Reading. The Philadelphia & Western is a third-rail, double-track, stone-ballasted railroad on private right-of-way, protected throughout by a modern block-signal system. All highway crossings are by overhead bridges or underpasses. Stations are located at

Ushers in a New Era on

& WESTERN

Design of New Cars with Radical Improvements was a Major Factor in the Extensive Rehabilitation Program

Portion of the Waiting Room on the Second Floor

Note the use of comfortable lounges in place of the hard benches of the typical railroad station. The stairways shown in the foreground lead to the train platform

convenient intervals. All have elevated platforms, obviating the necessity for car steps, and expediting the loading and unloading of trains.

Necessity for High Speeds

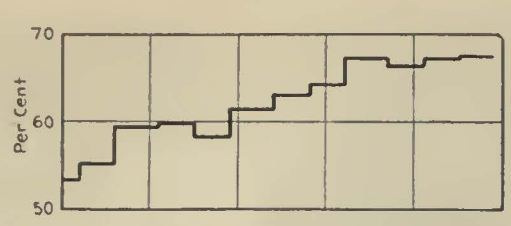
When the present management assumed control of the property in the summer of 1930, the electrification of the Pennsylvania Railroad's main line and Schuylkill Valley divisions had resulted in a reduction in the running time of that company's commuter trains to practically all communities in the territory. Between Philadelphia and Norristown the reduction was as much as thirteen minutes. In consequence, seven more minutes were consumed in traveling between these centers on Philadelphia & Western than on the Pennsylvania. With the running time fixed on the subway-elevated from 69th Street to the center of Philadelphia, the Philadelphia & Western was forced to speed up its own service to the maximum extent possible. Hence, the Conway interests, in the fall of 1930, addressed themselves to the problem of designing a new type of car.

The new management had pioneered with unusually high-speed operation on the Cincinnati & Lake Erie Railroad, also controlled by it. Readers of the Journal are familiar with the operating and physical characteristics of the equipment of that railroad, placed in service in the summer of 1930, and described in Electric Railway Journal for October, 1930 (Vol. 74, page 614).

As a starting point, one of the Cincinnati & Lake Erie interurban cars was shipped to Philadelphia. In tests made with it many lessons were learned concerning improvements in truck design, and, in collaboration with the J. G. Brill Company, a type of low-level truck was evolved which satisfactorily met the operating requirements on the Philadelphia & Western.

The next step in the design was an elaborate investigation, conducted in the wind tunnel of the University of Michigan under the direction of Prof. Felix W. Pawlowski, to determine the proportionate amount of power needed to overcome air resistance with the con-

P.&.W.'s new high-speed cars. A train on the Norristown division—America's first streamlined high-speed suburban equipment

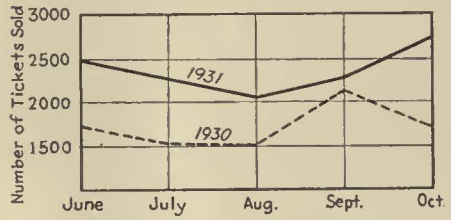


Per cent of total traffic out of Norristown on special one-day and two-day excursions that was handled by Philadelphia & Western, Dec. 2, 1930, to Oct. 27, 1931

ventional railroad coach, at speeds ranging from 10 to 90 m.p.h., and, especially, to determine the type or design, within practical limitations, which would permit of the attainment of the desired maximum speed with the lowest power consumption. The extent to which the various elements of the car, such as roof ventilators, etc., contributed to air resistance and consequent power consumption was given careful study.

Models of various proposed types of car were constructed to scale, each embodying some important difference in design, and so built that various apparatus could be removed. Other changes were made from time to time by the use of wax and putty. All told, 30 types of models were used in the tests. These experiments demonstrated that approximately 70 per cent of the energy consumed by the conventional interurban car, at speeds of 70 m.p.h. or more, was required to overcome air resistance, and that a streamlined car, weighing approximately 52,000 lb., could be constructed which would save 40 per cent or more of the energy required by the conventional type of suburban car, operating at speeds in excess of 60 m.p.h.

So far as is known, the Philadelphia & Western is the first American railroad to apply the lessons of the



Comparison of number of rides between Norristown and Philadelphia sold on twenty-trip and six-trip tickets in 1931, with number of rides sold on 50-trip tickets in 1930, June to October, inclusive

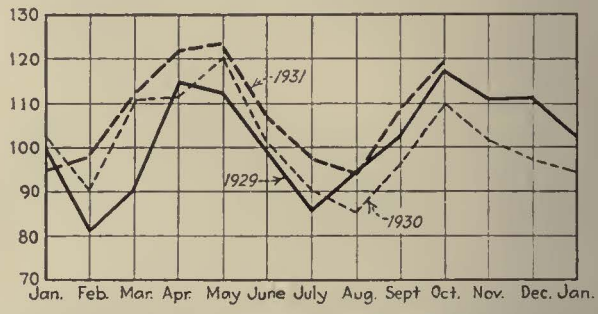
wind tunnel in the actual design and construction of high-speed railroad equipment. Many outstanding features of design and construction are embodied in the new cars. The bodies are fabricated almost entirely of aluminum. Steel is used in the body bolsters and roof carlines; the window sash, storm sash, hand rails and most of the hardware are of stainless steel. The headlinings and interior finish are aluminum. All glass in the vestibules and bulkhead windows is shatterproof.

A striking feature of design is the use of a polished aluminum belt rail and skirt which, in conjunction with the streamlining of the car and the brilliant Tuscan red lacquer finish of the car body, creates the illusion of a fast-flying arrow when the car is running at high speed.

The car doors are of the two-fold type. To make them airtight and watertight at high speeds involved unusual construction problems, including the evolution of an automatic air-locking mechanism. Special weather-stripping in the windows prevents the entrance of water at high speeds.

The absence of external ventilators is a notable feature. Air is drawn in through louvers situated near the doors, distributed through ducts along truss planks, and passed over the electric heaters into the car. The car heaters are divided into two circuits permitting of a variation in the amount of heat with the outside temperature. The heating system is so designed that the electric heaters are cut off while the motors are using energy. By this means, a substantial reduction in the maximum power demand was accomplished. A series of tests conducted by the management last winter demonstrated that even on a railroad of this character, such a heating system is entirely practicable.

Air is exhausted through longitudinal grilles in the

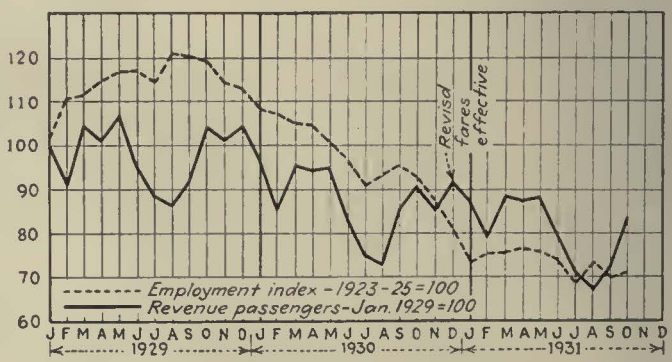


Trend of trips sold, in per cent of January, 1929, of tickets between 69th Street and stations between Wayne-St. Davids and Strafford, January, 1929, to October, 1931

headlining into ducts and thence carried to the rear when the car is in motion and to both ends when it is standing still. This positive ventilation is induced by two electric fans, both of which operate when the car is stationary, while the rear fan runs only when it is moving. In connection with the ventilating system, a new type of ceiling and headlining has been evolved, giving the interior of the car a most pleasing appearance.

In order to reduce to the minimum the time required at terminal stations for train reversal, the cars are wired so that by turning a one-directional switch the marker lights, car platform lights, doorway illuminating lights, door operating control circuit, the fare register actuating mechanism and the headlights are reversed. The cars are equipped with automatic car, air and electric self-centering couplers. Because of the severe braking with high speed and frequent stops, clasp brakes are used.

Full safety features for one-man operation are part of the equipment. In single units the cars are one-man



Comparison of trends in total revenue passengers carried and employment index for Philadelphia of the Federal Reserve Bank

operated; in trains of two or more cars an operator is carried on each car behind the leader, and collects fares and controls the operation of the doors on his car.

The co-ordination of research work performed by various agencies and preparation of detailed plans were under the direction of W. L. Butler, vice-chairman of Philadelphia & Western Railway, who in large measure was responsible for the development of the Cincinnati & Lake Erie high-speed car.

The weights of the various elements of the car are as follows:

Metal underframe and superstructure	5,905 lb.	
Couplers	1,120 lb.	
Seats	3,140 lb.	
Other materials and equipment required to complete car body, such as floor, roof, sash, doors and their mechanism, curtains, ventilating system, heaters, glass, paint, hand brakes, headlights, lighting apparatus, sanders, storage battery, etc	11,465 lb.	
Total car body, less following equipment	.....	21,630 lb
Trucks (Brill 89-E-2)	.....	16,390 lb.
Motors (Four GE-706A, 100 hp.)	.....	10,380 lb.
Control and other electrical equipment (G.E. PC 12)	.....	2,100 lb.
Air brakes (Westinghouse Traction Brake, MD-33 brake valve, D11-20 compressor)	.....	1,900 lb.
Total weight	.....	52,400 lb.

On Sunday, Nov. 15, new schedules were put into effect, greatly reducing the running time between all points. The time of express trains between the 69th Street terminal and Norristown was cut from 24 minutes to 17 minutes, a reduction of 29 per cent, while the time of other trains between these points was reduced from 28 to 20 minutes. The maintenance of limited train schedules of 49½ m.p.h., making a total of three stops on a one-way trip of 14 miles, establishes new standards of electric railroad operation. Operating tests have shown, however, that although this equipment is not yet run in, the schedule can be made without difficulty, with the trains coasting on the average 51.8 per cent of the total elapsed time on the northbound trip and 71.8 per cent of the time when operating southbound. Nothing more clearly or effectively demonstrates the great advantages of streamlining or the heavy price heretofore paid in high-speed operation by the failure to appreciate the large part which this factor has played in the operating costs of such service.

Careful studies were made to determine whether, from an economic viewpoint, it was preferable to scrap not only the older wooden cars but also some ten all-steel cars purchased in 1928 and 1929. It was decided that while these cars were not suitable for operation on the Norristown division, it was not only advisable but desirable to modernize them for use on the Strafford division, paralleling the main line of the Pennsylvania Railroad. A comparison of the pictures reproduced of the exteriors of these cars before and after modernization shows how greatly their appearance has been improved. Among the changes made were the shifting of braking and electric control apparatus from the right to the left sides of the platforms, permitting easier access by patrons, especially with one-man operation; installation of new safety protective mechanism; lowering of car floors approximately 8 in. through the reconstruction of trucks and changes in bolsters; changes in motor construction increasing their rating from 60 to 100 hp. each, and increasing the maximum speed on level track from 44 to 70 m.p.h., as well as the rate of acceleration. The reconstruction of trucks, effecting a lower center of gravity, tremendously improved the riding qualities. Seats were widened, and knee room increased; the smoking compartment in each car was abolished; parcel racks were removed and other changes increased the comfort and convenience of the cars.

Service on the Strafford division was also speeded up on Sunday, Nov. 15, the running time of express trains being reduced from 24 to 19 minutes, while the running time of locals was reduced from 28 to 23 minutes.

Track Improvements

In preparation for the higher speeds, an extensive program of track betterments was inaugurated last spring. The outside rail on all curves was elevated; wherever necessary, ties were replaced with treated ties; new ballast was installed where required; a number of block signals were moved to meet the requirements of faster operation; all station platforms were lowered to accommodate the low-level cars; new running rails were installed on the Norristown bridge, and other like changes were made. This program, now completed, assures not only smooth and comfortable track but also safety of the track structure.

These views bring out clearly some of the striking changes made in modernizing steel cars purchased in 1928-1929

A trip over the property is sufficient to convince any one that the Philadelphia & Western is in the forefront of American high-speed suburban railroads. The equipment now used in regular service is either brand-new or of the modernized type described. Schedule speeds are among the fastest now prevailing in America. The management is confident that these service improvements will result in a substantial increase in the traffic and revenues. The Philadelphia & Western traveler can now make as good, and in some instances much better, time to and from Philadelphia than on most of the trains operated by the competitive steam railroads.

As a city terminus, the Market Street Elevated-Subway line furnishes unusual advantages. There is a subway station in every large department store in Philadelphia, and most of the large office buildings, as well as the Broad Street subway, can now be reached by the Broad Street underground concourse. This is particularly advantageous in inclement weather. These two rapid

transit systems afford access to practically every section of Philadelphia, and provide an incomparable network of high-speed urban transportation for the Philadelphia & Western's patrons.

For a number of years the traffic and revenues of the road had progressively dwindled. In the twelve months ending July 31, 1930, immediately prior to the advent of the new management, the total number of revenue passengers carried was 21½ per cent less than in the corresponding period ending in July, 1926.

A comprehensive traffic and economic survey made by the management in 1930 led to the conclusion that the progressive horizontal percentage increases in rates of fare made at various times in the decade ending in 1927 had driven away much traffic; that many of the restrictions on the use of multiple-trip tickets were irksome to patrons and contrary to the best interests of the company; that a thoroughgoing revision of the entire rate structure was necessary, and that new and different types of tickets should be instituted and aggressively merchandised in order to attract new business and regain lost business. In addition, with one-man operation it seemed desirable to eliminate the use of pennies, since approximately 47 per cent of the total revenue passengers were paying cash fares.

Radical Changes Made in the Fare Structure

The outstanding changes in the tariffs, made effective on Nov. 16, 1930, or exactly one year prior to the inauguration of faster service with the new equipment, may be summarized as follows:

1. Minimum cash fares between any two points on the property are 10 cents, as contrasted with a previous minimum of 7 cents. On the other hand, passengers can ride for 10 cents distances theretofore costing from 12 to 16 cents.

2. The graduation of cash fares in accordance with mileage was abandoned. Both cash and ticket rates between 69th Street and nearby stations were considerably increased. On the other hand, such rates between 69th Street and more remote stations were substantially decreased, some as much as 37½ per cent.

3. Half-fare tickets for children were re-established.

4. In place of the ten-trip tickets theretofore sold, the sale of six-trip strip tickets, each coupon being good for use by bearer, was begun, the cost per trip in most cases being considerably less than the ten-trip ticket rate.

Fifty-trip tickets were abolished and twenty-trip tickets substituted, the cost per trip in general being substantially reduced. In addition, the privileges were greatly liberalized. Whereas the 50-trip ticket could be used only by the purchaser, the twenty-trip ticket could be used by any number of people traveling together.

On 60-trip monthly commutation tickets a rate of 8⅓ cents per ride was substituted for the graduated rate prevailing between 69th Street and most stations on the property, the purpose being to remove the fare barrier against the expansion of suburban development and thus aid in building up the outlying sections.

Round-trip excursion tickets good for use within two days, between Norristown and Philadelphia, were placed on sale at an attractive rate much below that formerly prevailing. This step was not only deemed desirable from the standpoint of promoting traffic, but was also necessary in order to meet a similar rate (but without the two-day feature) instituted by the Reading some months before the Conway interests assumed control of Philadelphia & Western. The volume of traffic riding on this ticket has shown a steady and substantial increase from month to month. The portion of the total traffic purchasing one-day or two-day round-trip excursion tickets riding on Philadelphia & Western is shown in the accompanying graph.

It was recognized that these changes in rates would initially result in a substantial reduction in revenue. While this was a grave step to take in a period of industrial depression, the management recognized that the reattraction of lost traffic and the development of new business was a task covering a period of years. It was believed desirable to undertake this without delay, offsetting the resultant loss in revenues by the introduction of operating economies.

Conferences with Local Editors and Civic Organizations to Discuss Policies

Prior to the announcement of impending changes in the fare structure, President Conway, at a dinner conference with the editors of the local newspapers, frankly and fully outlined the economic problems which the property faced; the nature of and reasons for the fare revisions contemplated, and the correlation of these revisions with the ambitious plans for service betterments. Out of this conference and subsequent contacts have grown up very friendly relations between the newspapers and the company, resulting in intelligent treatment of news with respect to current developments on the railway.

Concurrently with the announcement of fare changes, the company, through paid advertising and through its house organ, *P&W News* (regularly distributed on its cars and to an extensive mailing list), told why changes were necessary, and what the Philadelphia & Western planned to do. The company makes extensive and regular use of newspaper advertising in merchandising its service. A representative group of officials of the many civic organizations in the communities served were taken on a special trip over the property in the Cincinnati & Lake Erie interurban car, and at that time an explanation was made by the management of the steps which were being taken to evolve, if possible, an even better car for the local requirements.

In consequence of this policy, the extensive readjustment in the rate structure was made without any serious public friction. The relations between the company and its patrons have steadily increased in cordiality.

Interesting Steps in Creating New Classes of Traffic

Subsequent to the general revision in fares, a number of interesting innovations have been made, and have proved successful. Among these are:

1. During the summer of 1931 a joint ticket was sold by Philadelphia & Western in conjunction with the Wilson Line, operating fast excursion steamers on the Delaware River, affording a pleasant all-day or evening sail on the river at a very attractive rate of fare. A substantial amount of business of this character was developed, particularly in Norristown.

2. A station was established, used only for this purpose, near the Stadium of Villanova College. With the co-operation of the athletic association and the authorities of that institution, the use of the Philadelphia & Western in traveling to and from the Villanova games has been popularized.

3. In July last the sale of unlimited-use weekly commutation tickets was begun between Norristown and 69th Street simultaneously with the inauguration of a like ticket by the Pennsylvania Railroad. Shortly thereafter, the Reading Railroad put on sale a similar ticket. This ticket has proved very popular with Philadelphia & Western patrons, and has led to a substantial increase in commuter travel out of Norristown.

4. In the fall of 1931, Philadelphia & Western, in collaboration with the Tower Theater, at 69th Street, inaugurated a special joint ticket, placed on sale at Villanova College, entitling its students to a round trip between Villanova and 69th Street and admission to the Tower Theater. The cost of this ticket is no greater than the admission charged at the nearest neighborhood movie. A substantial amount of traffic has resulted. While the rate is comparatively low, it represents new business, filling seats which otherwise would be empty.

German Railway Installs Trolley Buses

This modern vehicle is the first trolley bus of current type to be installed in Germany

ALTHOUGH Germany claims the first trolley bus, built nearly 40 years ago, it was only in August, 1930, that the modern trolley bus made its appearance in that country. The installation is on a suburban route between Mettman and Gruiten, and was made as an experiment by the Rhenish-Westphalian Electric Company, owners of the local street railway system. The route is 5.77 km. (3½ miles) long, and is through very hilly country, only 165 ft. of the entire distance being level, and the grades being as high as 11.1 per cent. The road is quite crooked, 32 per cent of the distance having curves with radii as short as 12 m. (40 ft.). The population is sparse, Mettman being a city of 12,000 and Gruiten a village of 3,000, with slight development between. The trolley bus installation replaces a portion of a bus line, which was installed some two years previously, and which proved unprofitable. The portion electrified has the greatest possibility of development, and it is hoped to make the line self-sustaining.

The line is operated with two vehicles, the chassis of which were built by the Krupp works of Essen and the bodies by the Waggonfabrik of Uerdingen. The buses are six-wheeled, and are driven by a single motor, rated at 89 kw., 750 volts, 1,400 r.p.m., mounted with its shaft longitudinal. It is supported by lugs resting on the side frames of the chassis. The motor drives a differential, also mounted on the frame, and through it power is transmitted by means of short shafts and a gear train to the four rear wheels. The speed reduction is 11.8:1, and the maximum vehicle speed is 28 m.p.h.

Control is through a master switch actuated by the driver's foot. He can adjust the speed by varying the pressure on the pedal, the power being cut off automatically by a spring release when his foot is removed. Control is of the resistance type, except that the field is shunted on the last position. A second pedal controls the Lockheed hydraulic brakes, which act on all six wheels. In addition there is a hand brake, acting on the four rear wheels only through a system of levers. This combination of brakes assures positive control and safety on the severe grades encountered along the route.

The bus seats 30 passengers on upholstered cross and longitudinal seats, with fifteen additional standing places. A rack for baggage replaces the seat adjacent to the front door. One-man operation is provided for, passengers entering at the front and leaving at the rear. The front door is controlled by levers, while the rear door is closed electrically. Each trolley bus weighs 8,200 kg. (18,000 lb.). Its length is 9.34 m. (30 ft. 7 in.).

Power is supplied over four contact wires, two for each direction. On the straight sections these are suspended from side brackets made up of curved tubes forming a bow by which the wires are separated by strain insulators. On some of the curved parts of the line, the same construction is used, and at places suspension insulators are substituted. On the sharper curves, span construction is the rule. Both wood poles and lattice steel poles are used. For turning, there is a loop at one end of the line, and a wye at the other. In a few sections such as a railroad underpass, the route is served by a single pair of contact wires. At such points automatic switches are placed in the overhead. Current is taken off by means of two trolley poles with wheels mounted in swiveling harps. The bus can deviate from the center of the overhead as far as 4.5 m. (15 ft.) on either side without losing contact with the wires.

All of the electrical material for the installation was furnished by the Allgemeine Elektrizitäts Gesellschaft, of Berlin.

Turning out to pass another vehicle on a narrow road

Municipal Tramway Taxation

That Municipal Tramways in Great Britain are taxed in the same way as private undertakings is the contention made in a letter recently received from J. Beckett, general secretary the Municipal Tramways and Transport Association, who takes issue with a number of statements made in the article by John Spargo published in the September issue of Electric Railway Journal. *A copy of Mr. Beckett's letter was forwarded by this paper to Mr. Spargo, who accepts the correction, but points out that the principles enunciated in his article are in no way affected. Both these letters are published here for the information of the many readers of the* Journal *who are keenly interested in this important subject.*—Editor.

Situation In Great Britain Misrepresented

The Municipal Tramways and Transport Association

3 & 4 Clement's Inn., Strand,
London, W. C. 2
Oct. 19, 1931

To the Editor:

I read with interest and astonishment the article by John Spargo in your September issue, on the ancient theme of government in business. With interest, because it recalls a dead controversy in this country. With astonishment, because some of his statements are quite baseless and untrue, and, while they may mislead some ill-informed American readers, they unconsciously tell your British readers that he talks without the book.

He says that in his search for the difference, in their financial results, between municipally and privately owned systems of transport, he has been "digging below the surface," and has made some startling discoveries! Shortly stated he declares: (1) That municipalities may escape the heavy charge for paving, repairing and maintenance of the streets between the tracks, whereas it has to be borne by the operating company; and (2) that the last-named pays a large sum in taxes to the city, whereas the municipal system is untaxed, apparently on the theory that it would be absurd for the local authority to tax itself. Let me say that such a theory is unknown in Great Britain.

He goes on to say: "It is the universal practice to exempt municipal enterprise for taxation," and adds that this is "not only true of America, it is equally true of Great Britain. . . ." This misrepresentation is my justification for writing to you. The fact is that so far as this country is concerned, there is not a vestige of truth in it. Mr. Spargo's digging has been, apparently, unprofitable.

Every public utility service operated by local authorities is taxed, both imperially and locally, and transport undertakings are rated and taxed in precisely the same way as are company transport systems, and under the same laws. I will give you a few examples. The amounts paid for rates and taxes last year were as follows:

Tramways—Birmingham, £93,269; Bradford, £14,873; Glasgow, £159,247; Leeds, £41,784; Liverpool, £74,680; London County Council, £148,488; Manchester, £47,848.

The *total* amount paid by all the Local Authorities' tramways systems in Great Britain for rates and taxes for the year 1929-30, as shown by the Return of the Minister of Transport, was £997,939.

With regard to road maintenance, I will quote the Tramways Act, 1870. Notwithstanding the present use of the roads by vehicles not even dreamed of 60 years ago, the obligation is still the law and enforced upon municipal and private companies alike. Section 28 of the act enacts as follows:

The promoters shall, at their own expense, at all times maintain and keep in good condition and repair, with such materials and in such manner as the road authority shall direct, and to their satisfaction, so much of any road whereon any tramway belonging to them is laid as lies between the rails of the tramway and (where two tramways are laid by the same promoters in any road at a distance of not more than 4 ft. from each other) the portion of the road between the tramways, and in every case so much of the road as extends 18 in. beyond the rails of and on each side of any such tramway. If the promoters abandon their undertaking, or any part of the same, and take up any tramway or any part of any tramway belonging to them, they shall with all convenient speed, and in all cases within six weeks at the most (unless the road authority otherwise consents in writing), fill in the ground and make good the surface, and, to the satisfaction of the road authority, restore the portion of the road upon which such tramway was laid to as good a condition as that in which it was before such tramway was laid thereon, and clear away all surplus paving or metalling material or rubbish occasioned by such work; and they shall in the meantime cause the place where the road is opened or broken up to be fenced and watched, and to be properly lighted at night: Provided always, that if the promoters fail to comply with the provisions of this section, the road authority, if they think fit, may themselves at any time, after seven days' notice to the promoters, open and break up the road, and do the works necessary for the repair and maintenance or restoration of the road, to the extent in this section above mentioned, and the expense incurred by the road authority in so doing shall be repaid to them by the promoters.

The magnitude of the cost of this burden is illustrated by the following figures, showing the cost last year of giving effect to the section quoted above in the cities mentioned, *viz.*:

Repairs and Maintenance of Permanent Way—Birmingham, £69,975; Bradford, £24,263; Glasgow, £136,957; Leeds, £29,582; Liverpool, £51,900; London County Council, £162,902; Manchester, £57,882.

The total charge for the same purpose to the Local Authorities in Great Britain for the year 1929-30 was £1,349,968.

The author of this article is obviously a blind guide in the field of transport. It will interest your British readers in general, and the writer in particular, to learn how he came to fall into such egregious errors on matters of fact which can be so readily verified.

J. BECKETT (F.S.A.),
General Secretary.

John Spargo's Reply

Old Bennington, Vt.
Nov. 3, 1931

TO THE EDITOR:

The point that I tried to make in my article in the September issue of your paper was that statistical arguments on the subject of the relative merits of government versus voluntary enterprise in business are practically irrelevant; that there is a principle involved which is not materially affected by such statistical comparisons. I made it quite clear, I think, that even if the statistical arguments were conclusive in demonstrating that government operation was cheaper and equally efficient, the argument against government competition with private citizens in business would not be materially weakened. That was my main contention. Quite incidentally, I made certain observations concerning the well-known fact that statistics on this subject are notoriously misleading. I called attention to the fact that it is a common practice for municipal enterprises in this and other countries to be exempted from important charges which in the case of privately owned public service corporations constitute part of their fixed charges. Taxes and interest on bond issues are among the most important of these. Quite carelessly I added that the exemption of municipal enterprise from taxation in this country, is "equally true of Great Britain." Mr. Beckett is quite right in denying the latter statement, which I would not have made if the point had been of any importance to my article, or other than an incidental observation *inter alia*. I accept the correction gladly, and in turn beg to offer some corrections to Mr. Beckett.

When Mr. Beckett says that every public utility service is "taxed, both imperially and locally, and transport undertakings are rated and taxed in precisely the same way as are company transport systems, and under the same laws," he tells the truth, nothing but the truth, but not the whole truth, I think. No one can read the "Report from the Joint Select Committee on Municipal Trading," 1900, for example, without realizing that, in practice, there is serious discrimination in favor of municipal enterprises.

Mr. Beckett cites at some length the Tramways Act of 1870 upon the point of the cost of road maintenance between rails, but he is not really so naïve as to believe the the theory of this act and the common practice are in agreement. He is well aware, I feel certain, of the abuses which have repeatedly occurred due to the veto power of the municipality under the act. Will Mr. Beckett turn to Question 1203 in the report of the Select Committee above referred to and note the forced payment of £5,000? Will he turn to Questions 1517 to 1531, inclusive, and note the testimony of W. M. Murphy? When the chairman of the Select Committee demanded a "specific instance" of unfair and oppressive terms demanded by a municipal authority, quite beyond the scope of the Tramways Act of 1870, as cited by Mr. Beckett, Mr. Murphy complied by citing the case of Dumbarton where the municipality demanded as a condition that "in addition to the ordinary terms as to the paving of the streets" that a large block of buildings at a corner of a street be taken down.

It would be easy to fill an entire issue of ELECTRIC RAILWAY JOURNAL with testimony of the highest competence proving that the Tramways Act of 1870 which Mr. Beckett cites, despite the apparent fairness of its terms, has, through the veto power which it gives to municipal authorities, severely hampered the development of electric traction in Great Britain, especially interurban traction, and been made the instrument of discrimination against private enterprise. It has been a source of corruption and practices which my old friend John Burns, M.P., described as "almost on the verge of blackmailing" and "a scandal in the past" and "a disgrace to the present." I respectfully refer Mr. Beckett to the full text of this speech by John Burns. He will find it in Hansard's Parliamentary Debates, May 15, 1902.

I refer Mr. Beckett, further, to the evidence given before the Royal Commission upon the "Means of Locomotion and Transport in London," 1905. He will find the testimony of the Right Honorable James W. Lowther, later Speaker of the House of Commons, upon the effect of the famous Standing Order No. 22, by which the veto of the local municipal authorities is maintained. Mr. Lowther asserted that the veto power "has been most improperly used for the purpose of extorting all sorts of terms and conditions from tramway companies, and had subjected them to liabilities and disabilities which were never contemplated by Parliament." It is certainly well known to Mr. Beckett that even when Parliament has definitely refused its sanction to certain conditions tentatively agreed to by operating companies and municipal authorities, and voted to delete such provisions from Private Bills, as they are called, the obligations thus voted out of the bills are still imposed upon the companies as a condition of their existence. Refusal on the part of the companies to abide by conditions which Parliament has deliberately rejected and refused to sanction would bring about the use of

the municipal veto. The practical effect is a levy upon the private enterprise which can be called either extra-legal taxation or blackmail, as is chosen.

Mr. Beckett cites the provision of the Tramways Act of 1870 relating to road maintenance. What he is eloquently silent about is the practice which imposes upon private companies much heavier obligations of road maintenance than the act prescribes, in some cases, as in the Metropolitan London area, requiring the companies to pave the entire street. Municipal systems, on the other hand, are required only to pave and maintain the roadway in conformity with the provisions of the act. Moreover, in not a few of the Private Acts, so called, based upon provisional orders under the Tramways Act of 1870, there are conditions such as no municipal system has to meet. I cite the well-known case of the Lea Bridge, Leyton and Walthamstow Tramways Act, under which the company had to undertake to pay the greater part of the cost of widening a road, a project which had been before the Board of Works for years before the tramway was even proposed. This is a fairly common form of extra taxation imposed upon private business.

For 40 years and more I have been interested in the growth of municipal enterprise in Great Britain. I do not know anything definite of the work of the Municipal Tramways and Transport Association which Mr. Beckett represents, except that it is one of a class of organizations which have managed to acquire a very great power in English politics, a power which many of the most capable statesmen have deplored and held to be fraught with danger to the nation. I refer to such bodies as the Municipal Corporations Association and the Association of Urban District Councils. Such organizations, to a much larger extent than has been generally recognized here, have been responsible for the tremendous extension of municipal trading, with all the chain of evil results ensuing therefrom.

Mr. Beckett refers to the "ancient theme" of government in business, and tells us that it "recalls a dead controversy" in his country. His letter reached me on the same day as the news of the unexampled revolt of the British electorate against the Labor Party, and today, just as I began to write this letter, word came that the revolt against Socialism in the British municipalities which began last year has been continued this year. The returns indicate that the masses of the British people are aroused and have determined to put an end to those collectivist policies which have brought the nation to such a deplorable state. The "dead controversy" seems to be a very lively corpse!

JOHN SPARGO.

Transportation Not Neglected in City Planning Study at Harvard

HARVARD UNIVERSITY
CAMBRIDGE, MASS., Nov. 18, 1931

TO THE EDITOR:

A friend has called to my attention, with much ribald glee, your editorial in the November number of the ELECTRIC RAILWAY JOURNAL, entitled "Misplaced Emphasis in City Planning."

Since Harvard is the only "large Eastern university, listing a total of 24 courses of study" in this subject, I am probably safe in assuming that you refer to the Harvard Graduate School of City Planning.

As to your first paragraph, I heartily agree with you, that, in city planning, beauty cannot be sought for its own sake alone. I should say, however, that beauty is a flavor integral with the cake or an intelligent mixing and baking, rather than an icing which might be later applied to make salable a cake inwardly nasty or indigestible.

In the rest of your editorial you make the following statements as to the Harvard teaching:

"Two important courses deal with horticulture and plants." In fact these courses require not 2/24, or more than 8 per cent, of the total time of the student as apparently you inferred, but only 3.5 per cent; and of this time two-thirds is devoted to design in lines and masses of trees in cities. This does not seem a very unreasonable allotment when you consider that usually in smaller towns there are many more trees than houses, and that the trees are probably rather the better looking!

"Another course embraces the history of Mediaeval, Renaissance and modern art." Apparently you are doubtful of the value of such information to a city planner. Personnally, I think that some little knowledge of the esthetic accomplishments of the past is worth while for anyone who is at least partly an artist, and merits our allotment of 1.9 per cent of the student's time.

"Nowhere is any consideration given to the relationship between transportation facilities and civic development." I am sorry if any blindness of statement in the pamphlet led you to this surprising conclusion. In any case, the facts are quite otherwise. Out of a total of more than 5,000 working hours required to be devoted to the whole curriculum, about 370 working hours or 7.3 per cent are usually devoted primarily to transit and transportation. Since it is practically impossible to study any major city planning problem in the school without taking into account transit and transportation, we do not feel that this side of the subject is badly neglected.

The case being as I have stated it above, naturally there remains little ground for your inference that "no previous instruction having been given on the subject of transportation, the student apparently is expected to sketch in a few routes at random, and call the result a community transit system." Twenty years of experience in instruction in city planning have, I hope, taught us better than this. But nevertheless, we would not have a student of ours believe that, with all our regular instruction, he was fitted to design a working transit system. Transit design is a field in itself, worthy of a man's whole time and requiring highly specialized training. We are trying to teach city planning as a whole. Therefore, we ask our students to think of transit and transportation in their relation to the places reached, and the people and things carried, i.e., as one of the many interrelated community services to which they can give, in their limited course, only its due proportion of their time.

Since you have hardly given a fair picture of the work of the Harvard school, I am asking you, as a good sport and a man interested in co-operation in city planning, to print this letter as you printed your editorial.

H. V. HUBBARD
Chairman, Harvard School of City Planning.

By B. P. LEGARÉ
Engineer of Maintenance of Way and Construction
Market Street Railway
San Francisco, Cal.

Rebuilding Track Under Heavy Traffic

Efficient mechanical and labor organization was developed by Market Street Railway of San Francisco to work under particularly severe conditions. A job ordinarily requiring three or four months was completed in 24 working days

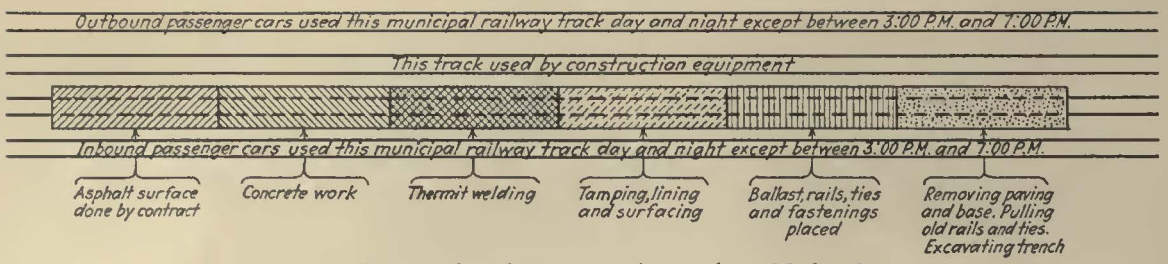
RECONSTRUCTION of 8,136 ft. of single track on Market Street, San Francisco, was recently completed by the Market Street Railway. On this street there are four tracks, the outer two belonging to the city and the inner two of the Market Street Railway. The headways are short on all of the four tracks, making it impracticable to use ordinary methods of reconstruction, without seriously delaying service and thereby greatly inconveniencing the traveling public, and, incidentally, losing a large amount of local business.

Track construction methods previously employed involved the use of portable crossovers. On account of the number of cars on this line, the distance between crossovers necessarily had to be short, thus making the cost excessive, and delaying the conclusion of the undertaking, as only a limited number of men could work simultaneously on the job. To overcome this difficulty, a plan was worked out whereby the Market Street Railway operated over the city's tracks, except during the afternoon rush hours, special crossovers being installed for this purpose at the ends of the section being rebuilt.

The city's tracks were used on a rental basis per car-mile. Because the city did not have power supply sufficient for the Market Street Railway's cars in addition to its own, the line was sectionalized. The city then furnished current for all cars for one section and the Market Street Railway furnished it on the other section.

The plan adopted worked without any inconvenience

Large crane with A-frame removing old rails on Market Street, San Francisco



Progress diagram of track reconstruction work on Market Street

to the traveling public, and permitted the work being done in 24 working days instead of taking from three to four months. To accomplish this, the organization had to function like clockwork, with every man on his toes. On account of the large number of men out of employment during this period, an unusually intelligent class of labor was available. Although most of the men were new at this particular kind of work, they needed only to be shown and to get accustomed to it. The way they worked and the good results accomplished created favorable comment from every one.

Construction Suspended During Rush Hours

Before commencing the reconstruction, four 9-in. paved crossovers were installed, two at each end of the job. These were used to switch the Market Street Railway's cars from the inner to the outer tracks, for twenty hours from 7 p.m. one day to 3 p.m. the next day, except on Saturdays and Sundays. Just before 3 p.m. each day, the new and old inner tracks were reconnected so cars could operate on the new track from 3 p.m. to 7 p.m., these being the rush hours when it was deemed inadvisable to attempt to operate the cars of both lines over the same rails.

Section insulators were installed on the trolley wires to separate the two sections. Electric recorders counted the number of Market Street Railway cars running on outside tracks. A map was made showing the location of section insulators, and the exact distance in miles from crossover to crossover on each outside track and from section insulator to section insulator, this distance being used for figuring all car-miles.

Four knuckle-joint spring switch mechanisms were installed at the "point-on" end of each crossover, and one flagman and one switchman were stationed at each end, making a total of four during the time cars were running on outside tracks. The flagman was furnished by the operating department and the switchman by the engineering department. The city police department was notified before any cross streets were blocked, and officers were sent to the blocked crossing to handle traffic. The blocking was for a few hours only, and, as soon as rail was laid on ties, temporary tie crossings were installed so traffic could cross.

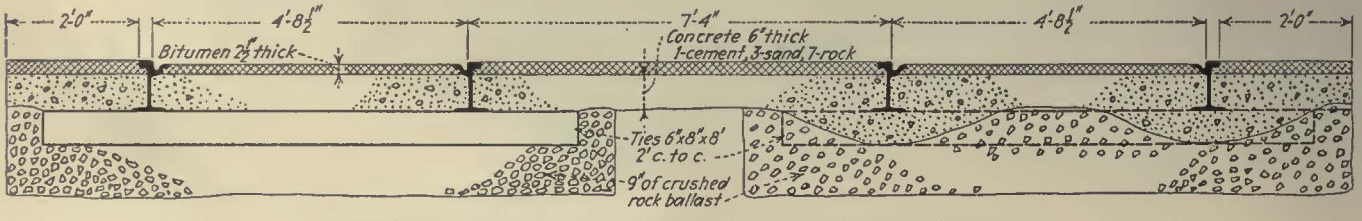
The old track, built in 1909, consisted of 9-in. 141-lb. grooved rail, with wood ties on 9 in. of ballast. The original paving was 2½ in. of asphalt on concrete foundation. On account of many years of repairs most of the concrete had been cut out along the rails, and 6 in. to 7 in. of asphalt used in its place. For this reason it was possible by using an "A" frame to pull the rails out, leaving the ties in place without first breaking up the concrete. The new construction consists of 9-in. 121-lb. grooved rail, new wood ties, 9 in. of new ballast, thermit joints, and 2½ in. of asphalt surface on concrete.

The inbound track was built first for its full length, the outbound track being used for a work track for the construction cars and derrick. After the inbound track was completed, the outbound track was built in the same way, using the new inbound track for a work track. The job was handled by a day force and a night force, the day force consisting of approximately 95 men working from 6 a.m. to 3 p.m. with half an hour off at noon time for lunch, and the main night force from 8:30 p.m. to 6 a.m. The derrick car worked from 7 p.m. to 6 a.m. The total night force was approximately 50 men, making a total of 145 trackmen not including car crews and paving men. This force was supervised carefully and a few men added or subtracted according to the progress of the work.

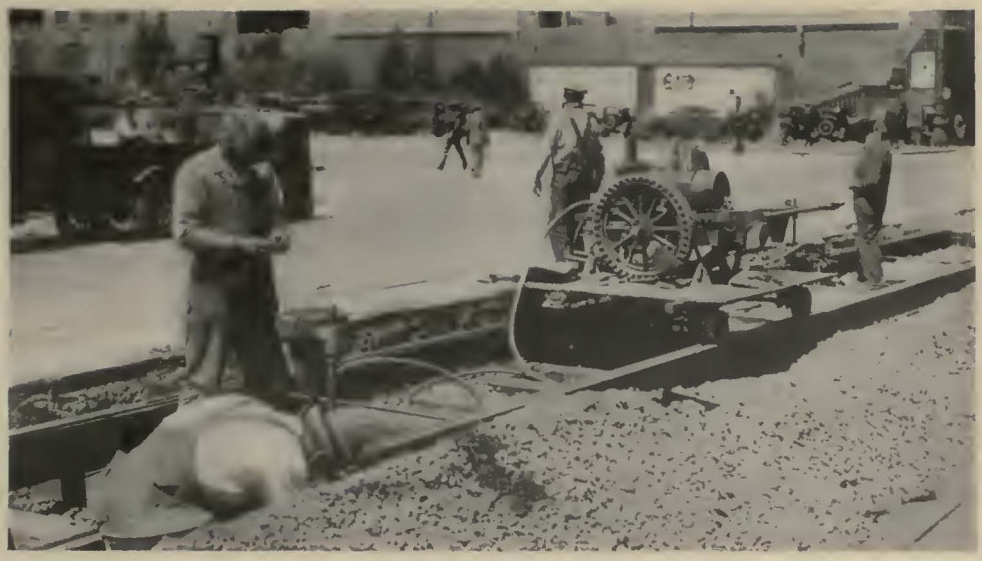
Rails Laid During Day Shift

The derrick started pulling up track with an "A" frame at 7 p.m., and after pulling about 100 ft. of track, lifted the rails out of the trench, so when the main gang arrived at 8:30 p.m. the paving had been broken up and was ready to be shoveled into the cars. The derrick continued pulling track and dragging rails out of the trench until 200 ft. of track had been torn up. Later if sufficient progress had been made in digging the trench, more track was pulled so that the day crew, starting at 6 a.m., could begin loading cars immediately.

No track was laid at night, the work at that time consisted only of track pulling, excavating and loading in cars and hauling from the job the cleanup material, old rails and old ties. Three dump cars were used, two usually being on the job and loading, while one was in transit. About 30 to 35 men were employed in excavating and loading these two cars. All cleanup material from the ditch was hauled 4 miles to a dump where it was



Cross-section of new track on Market Street, San Francisco



All joints of reconstructed tracks were thermit-welded. Welding apparatus was mounted on a small movable truck

pushed over a bank by an unloader and spreader crane. This work was done both day and night.

During the day a force of from 30 to 35 men excavated and loaded material on the cars in the same manner as the night crew. Two concrete breaker outfits, each consisting of two men and a compressor, worked with the night gang, and the same number with the day gang, breaking concrete along the edge of the trench. They also loosened the earth and old ballast in the trench. Both the night gang and the day gang had an outfit for cutting rails, tie rods and joint bolts.

The rail laying gang of two spiking crews and the tie laying men followed the excavating gang, laying in the 8½-hour period from 6 a.m. to 3 p.m. the full run of excavated track, and made the final connection with the old rails just before 3 p.m.

A center cab car loaded with new ties remained all day on the new track behind the rail laying gang so the ties were handy to be placed in the trench by the derrick. The ties, when loaded on this car, were placed in lots of about 40 each, with a space under them and a space between each load so the derrick cable could easily be passed around the bundle for lifting it off the car. A similar car loaded with enough new rail for one day's work also remained on the job near the rail laying gang, in a location convenient for the placing of the new rail on the new ties by the derrick. Tie plates and tie rods were carried on the rail and tie cars. Before placing the

To supply air for pneumatic tools, a large compressor was mounted on a work car and portable gasoline compressors placed at the curb

ties in the trench, dump cars poured crushed rock in the trench behind the excavating gang and men spread it so the rails and ties, when laid, were a couple of inches below grade.

The line and grade engineers started work at 6 a.m. each day and placed stakes at the side of the trench behind the excavating gang. A mark was made on each stake 16 in. below grade, this being the desired height to which rock was to be spread. The ditch was dug 9 ft. wide and 2 ft. deep, depth being measured from the paving adjacent to the rails alongside the trench.

Premixed concrete was used for the paving base with asphalt for the surface

Behind the rail laying gang came eight air tie tamper outfits. When the tamper gang started on the job it was about 1,000 ft. behind the excavating gang, but at the finish this distance had been reduced to approximately 750 ft. This outfit consisted of eight air tamper men, four feeder men, two other men and one foreman, a total of fifteen men. Ahead of and behind the tamper gang was a hand tamper gang of twelve to fourteen men, doing the preliminary track raising ahead of tampers and the final lining and tamping behind the tampers and directly ahead of the concrete gang. The same gang also attended to the installing, changing and removing of temporary tie crossings. The tamping outfit worked at the rate of about 360 ft. of single track for the 8½-hour day. The air compressor and tool box were kept on a construction car behind the tamping gang, and moved up as the work progressed. This compressor was able to run six tampers at 70-lb. pressure. Two additional tampers were supplied with air by a gas-driven compressor standing at the curb and delivering air to tampers by an "over the trolley wires" hose outfit. Two of these hose outfits were used. The overhead lines department changed them every day so one hose was always set up ahead.

Close behind the tamper gang came the thermit-weld outfit, welding joints at the rate of about two per hour. The entire outfit, including preheater, was carried on a small push car, with a body 6 ft. square, which was pushed along the track as the work progressed. The gang consisted of three men welding, one on molds, two filing joints and the foreman, making a total of seven men. The filing was done with a ⅞-in. square bastard file, then finished with a Vixen file. The usual rotary grinding of the thermit weld was not done as it was found much cheaper and safer to cut the riser and waste material from the weld while still hot with a cold chisel, leaving very little metal to be filed smooth. Two wheel tool boxes were part of this welding outfit.

The concrete gang followed the welders, placing premixed concrete delivered in 4-cu.yd. trucks, which dumped the concrete into a chute across the rails, depositing it in the trench. This gang worked nearly every day preparing the pockets under the rail for concrete and placing the concrete. Three trucks were used and eight men laid the concrete at the rate of approximately 360 ft. per day. After the concrete had set two days, the asphalt was laid by a contractor, a day's run varying from 8,000 to 16,000 sq.ft. Before laying the asphalt, the concrete base was cleaned and painted ahead of the asphalt gang by Market Street Railway men.

The total number of passing cars registered during the 24 days when all cars ran on the two outside tracks was 64,320. This is equivalent to 2,680 cars per day, or an average for the twenty hours during construction of 67 cars per hour on each track. Although vehicles were operated at short intervals on both sides of the tracks being reconstructed, with clearance of only 2½ ft. between them and the edge of the ditch, there was only one accident during the entire undertaking. This was occasioned by an auto driver, who was speeding during the early morning hours.

A large crane mounted on work car was on hand at all times for pulling rails, handling ties and placing new rails

Form Designed for

Standardized Analysis of Claims Statistics

Comparison of claims figures on equalized bases, full information of costs for one company and a proper comparison of data from any other property are afforded

REALIZING that "figures do lie" when the information they convey is incomplete, or is founded upon improper premises and can result in mistaken and erroneous conclusions, the Mid-West Claim Agents' Association, at its recent convention in Denver, made a definite contribution toward the ultimate standardization of claims statistics. The form, given here in detail, and an explanation of it were presented to the association by Charles L. Carr, general solicitor Kansas City Public Service Company. Mr. Carr's discussion of the form is the basis of this article.

Reference to the form consists of seven main subdivisions—namely: operating statistics, accidents, claims, lawsuits, trials, expenditures, and injuries and damages statistics—compared and equalized. It has spaces for entering figures for the current year and the preceding year. The first division, operating statistics (1 to 16), sets forth all passenger car-mile and revenue figures for both railway and bus lines which are needed for computing averages. Miscellaneous statistics of the community or area served also are included to give a general picture of the nature and volume of the particular service.

The subdivision on accidents (17 to 28) gives details on accidents of all classes, both in total and on a mileage basis, in such form that they may be used in a later subdivision in comparing claim statistics.

Claims (29 to 36) comprise the next subdivision. The number settled, the aggregate amounts paid to claimants and the average amount paid per claim settled are given. The items both exclude and include compensation claims, because the latter are scheduled amounts in which there is no element of negotiation, and because some companies might not be under compensation.

Lawsuits (37 to 54) include the number and amounts of such suits pending and filed during the year, and the increase or decrease for the year. The data show whether or not the particular company is disposing of its I.&D. potential liability as expressed in lawsuits to the same or to a greater or lesser extent than is charged or set up against the company in new lawsuits filed. This is very important in ascertaining the particular company's yearly potential liability and in equalizing the I.&D. expenditures for the year as between companies. Figures on lawsuits dismissed, settled prior to verdict or judgment, or disposed of, with the average amount paid, are of particular interest for comparative purposes.

The importance of the information contained in this subdivision as a guide to departmental efficiency is more fully understood when it is realized that claims become actively dangerous only when presented in the form of lawsuits, and that the departmental efficiency in handling claims (presented as such) is, in general, measured by the number of lawsuits filed. If proper claim settlements are not made, increased lawsuits result. Lawsuit data, therefore, are a very important guide to claim efficiency.

Trials (55 to 65) include judgments, hung juries, demurrers to evidence sustained, non suits, dismissals during trial, and aggregate amounts paid on judgments. The previous statement with respect to lawsuits filed measuring claim efficiency applies equally to trials as measuring efficiency in the prior handling and settlement of lawsuits. If proper lawsuit settlements or proper preparation for trial be not made, trials will result in adverse verdicts and judgments, increasing I.&D. expenditures, all to the detriment of the particular company, and this will be registered in the above trial statistics.

Included under expenditures (66 to 69, 35 to 49) are the amounts paid for salaries and to outside attorneys, and the I.&D. expenditures. The last-mentioned figures are used in the next subdivision as a basis in comparing and equalizing I.&D. statistics.

Under the heading "I.&D. Statistics—Compared and Equalized" (70 to 81) is the meat of the entire form, the prior subdivisions being preliminary in supplying data and in painting a general picture. Three bases for comparing injury and damage statistics are used—namely: (1) percentage of total I.&D. expenditures to passenger revenue (which is not approved except as equalized as hereinafter explained); (2) I.&D. cost per passenger car-mile, both actual and equalized; and (3) average total cost per public accident and all accidents, both actual and equalized.

Three equalizing factors are used in this subdivision in connection with the above bases to make a fair and proper comparison of I.&D. statistics between various electric railway companies. These are: first, the equalization of lawsuit settlements on a basis of one year's potential lawsuit liability for the respective companies; second, the equalization of passenger revenue per passenger car-mile; and, third, the equalization of public accidents per passenger car-mile.

The reasons back of the above three equalizing factors are as follows: First, with regard to the equalization of lawsuit settlements on the basis of one year's potential

Operating, Accident and Claim Statistics

Operating Statistics

1. Population in community or area served.
2. Miles of track (single) in vehicular traveled thoroughfares, public streets and roadways.
3. Miles of track (single) on separate right-of-way, public or private (excludes barn and yard trackage).
4. Passenger car-miles—railway and bus.
5. Passenger car-miles—railway.
6. Passenger car-miles—bus.
7. Passenger revenue—railway and bus.
8. Passenger revenue—railway.
9. Passenger revenue—bus.
10. Passenger revenue per passenger car-mile—railway and bus.
11. Passenger revenue per passenger car-mile—railway.
12. Passenger revenue per passenger car-mile—bus.
13. Reserve for I. & D. per car-mile—railway.
14. Reserve for I. & D. per car-mile—bus.
15. Average number of street cars operated (week day p.m. rush).
16. Average number of buses operated (week day p.m. rush).

Accidents

17. Accidents, all classes—railway and bus.
18. Accidents, all classes—railway.
19. Accidents, all classes—bus.
20. Public accidents (other than to employees only)—railway and bus.
21. Public accidents (other than to employees only)—railway.
22. Public accidents (other than to employees only)—bus.
23. Accidents, all classes per 1,000,000 car-miles—railway and bus.
24. Accidents, all classes per 1,000,000 passenger car-miles—railway.
25. Accidents, all classes per 1,000,000 passenger car-miles—bus.
26. Public accidents (other than to employees only) per 1,000,000 passenger car-miles—railway and bus.
27. Public accidents (other than to employees only) per 1,000,000 passenger car-miles—railway.
28. Public accidents (other than to employees only) per 1,000,000 passenger car-miles—bus.

Claims—Railway and Bus

29. Number of claims (other than employees' compensation claims) settled.
30. Aggregate amount paid to claimants (other than to employees on compensation).
31. Average amount paid per claim settled (excluding compensation claims).
32. Number of employees' compensation claims settled.
33. Aggregate amount of compensation paid to employees for injuries.
34. Number of claims settled (includes compensation claims).
35. Aggregate amount paid to claimants (includes compensation claims).
36. Average amount paid per claim settled (includes compensation claims).

Lawsuits

37. Lawsuits pending beginning of year—number.
38. Lawsuits pending beginning of year—amount sued for.
39. Lawsuits filed—number.
40. Lawsuits filed—amount sued for.
41. Lawsuits dismissed (no payment to plaintiff)—number.
42. Lawsuits dismissed (no payment to plaintiff)—amount sued for.
43. Lawsuits settled prior to verdict or judgment—number.
44. Lawsuits settled prior to verdict or judgment—amount sued for.
45. Lawsuits settled prior to verdict or judgment—aggregate amount paid.
46. Lawsuits settled prior to verdict or judgment—average amount paid.
47. Lawsuits disposed of—number.
48. Lawsuits disposed of—amount sued for.
49. Amount paid to plaintiffs and their attorneys (includes judgments paid, No. 64).
50. Average amount paid per lawsuit disposed of.
51. Lawsuits pending at end of year—number.
52. Lawsuits pending at end of year—amount sued for.
53. Increase or decrease in lawsuits pending—number.
54. Increase or decrease in lawsuits pending—amount sued for.

Trials

55. Judgments for plaintiff—number.
56. Judgments for plaintiff—amount.
57. Amount sued for in suits resulting in judgments for plaintiff.
58. Judgments for defendant—number.
59. Amount sued for in suits resulting in judgments for defendant.
60. Hung jury—number.
61. Hung jury—amount sued for.
62. Demurrers to evidence sustained, nonsuits, and dismissals during trials.
63. Judgments for plaintiff paid—number.
64. Judgments for plaintiff paid—amount of judgments.
65. Judgments for plaintiff paid—amount sued for.

Expenditures

66. Salaries of law department (I. & D.) (claims and lawsuits).
67. Compensation outside attorneys (I. & D.).
68. Expenses of law department (I. & D.) other than settlement of claims and lawsuits, salaries and compensation of attorneys (excludes 35, 49, 66, and 67).
69. Total expenditures of law department (I. & D.) (claims and lawsuits) (includes 35, 49, 66, 67, and 68).

I. & D. Statistics—Compared and Equalized

70. Percentage, total actual expenditures law department (I. & D.) to actual passenger revenue (69 ÷ 7).
71. Total expenditures, law department (I. & D.) equalized re lawsuits. (Actual expenditures decreased by cost of excess lawsuits [more than filed] disposed of at average cost per lawsuit disposed of (53 × 50) or increased by average cost per lawsuit disposed of times increase in number of lawsuits (50 × 53).
72. Percentage, total expenditures equalized re lawsuits (71) to passenger revenue (7).
73. Same as 72 for K. C. P. S. Company, but other company equalize passenger revenue on basis of passenger revenue per passenger car-mile of K. C. P. S. Company. Other company = other company 71 ÷ (K. C. P. S. Company 10 × other company 4).
74. Same as 73 but other company equalize expenditures in ratio of number of public accidents per passenger car-mile. Other company = (other company 73 × K.C.P.S. Company 26) ÷ other company 26.
75. I. & D. cost per passenger car-mile.
76. I. & D. cost per passenger car-mile equalized re lawsuits as above (71 ÷ 4).
77. Same as 76 but other company equalize expenditures in ratio of number of public accidents per passenger car-mile. Other company = (other company 76 × K.C.P.S. Company 26) ÷ other company 26.
78. Average total cost per public accident (excluding compensation to employees) regardless of number of claims involved in any one accident (69 — 33) ÷ 20.
79. Average total cost per public accident equalized re lawsuits as above (71 33) ÷ 20.
80. Average total cost per accident (including claims of and amounts paid to employees for injuries) regardless of number of claims involved in any one accident (69 ÷ 17).
81. Average total cost per accident (including claims of and amounts paid to employees for injuries) equalized re lawsuits as above. (71 ÷ 17).

lawsuit liability. If a fair comparison of I.&D. expenditures is to be made between companies, it should be made not upon the actual expenditures, but upon the basis of the particular year's potential liability. This can be best approximated and measured by the number of lawsuits filed against the particular company in the given year. If a company has disposed of more lawsuits than were filed during the year and has thus increased its expenditures, it should not be penalized for so doing, and its actual expenditures should be reduced to the extent of the excess liability disposed of. This should be measured by the particular company's experience in connection with the average amount paid per lawsuit disposed of, multiplied by the excess number of lawsuits disposed of. If on the other hand, a particular company has disposed of less lawsuits than were filed during the year and has thus decreased its expenditures, it should not be favored for so doing and its actual expenditures should be increased to the extent of the excess liability not disposed of. This should be measured by the particular company's experience in connection with the average amount paid per lawsuit disposed of multiplied by the excess number of lawsuits filed. No company should be permitted to stand by and not settle or dispose of its I.&D. liability, and then be congratulated for its efficiency, or lack of it.

Second, with regard to the equalization of passenger revenue per passenger car-mile. If I.&D. expenditures are to be compared on the basis of passenger revenue per passenger car-mile, each company should not be permitted to use its own and varying passenger revenue per passenger car-mile, but all companies should be required to use the same passenger revenue per passenger car-mile so that this figure will be the same and not a variable. It is submitted, that if passenger revenue is to be used as a guide, it should be figured on the same passenger revenue per passenger car-mile, and multiplied by the number of passenger car-miles that the particular company operates.

Third, with regard to the equalization of public accidents per passenger car-mile. If a comparison is to be made between claim and legal (or law) departments of various electric railway companies to be advised as to their relative efficiency, the variable of the number of public accidents per passenger car-mile on the lines of the various companies should be eliminated, and the particular number of public accidents per passenger car-mile of one of the companies should be adopted as the common unit for all companies. The claim department should not be penalized because the transportation department of that company has been so fortunate as to have a lesser number of public accidents per passenger car-mile than other companies. The department handling injury and damage matters should be judged by its own conduct, and not by the happenings in other departments.

With the above in mind, consider now the three bases mentioned for comparing injury and damage statistics.

First, percentage of I.&D. expenditures to passenger revenue. From what has been stated it seems absurd to make any comparison based upon the percentage of actual I.&D. expenditures to actual passenger revenue, a comparison that is based upon two variables. Item 70 of the form sets out this particular percentage, not with any idea of giving it approval, but merely as a starting point from which to figure the percentage of I.&D. expenditures equalized, in regard to lawsuits and in number of public accidents per passenger car-mile to passenger revenue equalized on the basis of the passenger revenue per passenger car-mile.

Second, I.&D. cost per passenger car-mile. The basis of I.&D. cost per passenger car-mile is an accurate and fair basis of comparison of I.&D. statistics. When the basis is equalized with respect to lawsuits as above outlined and is also equalized on the basis of the number of public accidents per passenger car-mile, it becomes a very accurate and just basis of comparison.

Third, average total cost per accident. If a comparison is to be made between departments of various companies handling I.&D. matters, it is held that the most accurate basis of comparison (where the departments to be compared operate under compensation laws with regard to employees injured) is the average total cost per public accident (excluding compensation to employees) equalized with regard to lawsuits.

Also included in the form is the average total cost per accident (including claims of and amounts paid to employees for injuries) both actual and as equalized in respect to lawsuits, for comparison with those companies that do not operate under workmen's compensation laws.

Commercial Drivers Will Compete For Safety

SAFETY will be the determining factor in a contest among commercial vehicle drivers, which is to start on a country-wide basis on Jan. 1, under the auspices of the National Safety Council. Sixteen divisions have been made among members of the Delivery, Taxicab and Bus Section of the Council according to the business engaged in. Buses, public utilities and taxicabs are included. Two prizes are to be awarded in each division, one to the larger and the other to the smaller fleet making the best no-accident record during a half-year period.

The contest will close on June 30, 1932. The winners of each group shall be the units having the lowest number of accidents per 100,000 vehicle-miles (or vehicle-hours if so decided by the division).

Rules governing the contest have been compiled by a special committee from the Delivery, Taxicab and Bus Section of the National Safety Council, of which A. E. Lundsteadt, Bowman Dairy Company, Chicago, is chairman.

El Paso's rebuilt car for service on the Juarez line, operating across the Mexican border

Spacious aisles will facilitate customs inspection at the border line

El Paso Rebuilds Cars for Greater Safety and Speed

By J. E. Lawless
Master Mechanic
El Paso Electric Company

MODERNIZATION in El Paso calls for the complete rebuilding of cars in shops fully equipped for the work. Thus far plans have been confined to the remodeling of twelve double-truck cars for the lines serving Juarez, Mexico. This equipment was formerly in use on city lines, where service is now being furnished by Birney cars. The Juarez line is the only line of the El Paso Electric Company with two-men operation, made necessary by the requirements of customs inspection at the Mexican border.

Eight of the remodeled cars are now in operation, having been rebuilt at a cost of $1,000 each. Work on the remaining cars is progressing rapidly, and they are being turned out of the shop at the rate of one per week. These remodeled cars have been improved to offer increased safety, greater comfort and high speeds.

Rear platforms are arranged to permit the conductor to stand at the left of the rear entrance portal. This arrangement will permit a group of passengers to board and pay their fares without blocking the entrance doors. In addition, the conductor will have an unobstructed view of the interior and greater freedom of movement. Front and rear doors are equipped with automatic treadles. The old cars had high platforms with two steps, and manually operated doors. On the remodeled cars the exit doors will open only when the car has come to a full stop and will not close until the passenger has left the step. A signal light in front of the motorman will inform him whether the doors are closed or open.

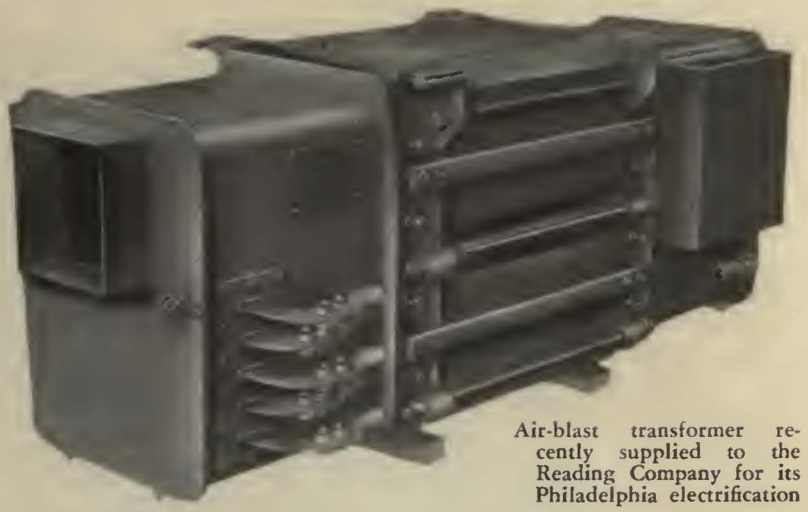
The dead-man control will insure safe operation. The motorman must hold the controller handle down, or keep his foot on the foot controller in order to keep the car running. Unless this is done the power will be cut off and the brakes will be set automatically. Mirrors placed inside the car will permit the motorman to see approaching passengers who wish to alight at the front end. A single-stroke electrical signal bell of an improved type has been installed. This bell is independent of the passenger signal bell, and represents a decided advance over the old-type bell cord running through the car.

The cars have $\frac{7}{8}$-in. hardwood flooring, covered by $\frac{1}{2}$-in. Celotex insulation and $\frac{3}{8}$-in. battleship linoleum. This type of floor reduces the noise reaching the interior of the car and is easy to keep clean. Comfortably upholstered longitudinal seats have been installed to facilitate the work of customs inspectors.

Ample illumination is provided by six dome-type lighting fixtures, extending through the center of the car. The dash is lighted by five 56-watt lamps, mounted under the belt at each end of the car and placed in a covered-type reflector made of 60-gage metal. These lights are completely concealed to eliminate all direct glare. The entire front dash of the car is illuminated by these lights, creating a pleasing effect.

The exterior is painted with an attractive color scheme of red, white and blue. The interior is finished in mahogany enamel, with a white enamel ceiling. All lettering and striping is done in gold.

By S. S. Cook
and C. Brockman
Westinghouse Electric & Manufacturing Company



Air-blast transformer recently supplied to the Reading Company for its Philadelphia electrification

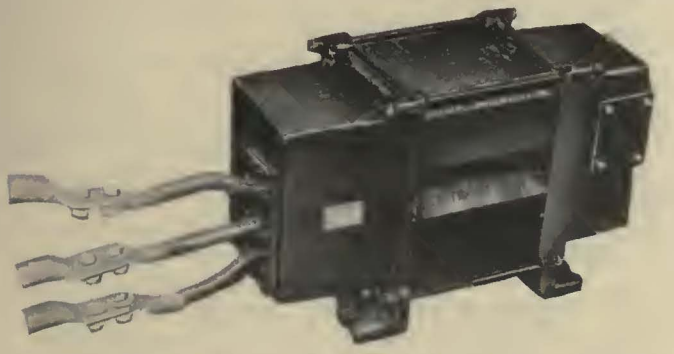
Progress in

Railway Transformer Design

In the development of transformers for railway service, designers have endeavored continuously to reduce the weight without sacrificing reliability. Some of the things which have contributed largely to the reduction in weight are: (1) use of structural steel end frames; (2) use of structural steel coil bracing; (3) cutting the corners off the punchings; (4) omission of the metal housing around the punchings. As an example of what has been accomplished in weight reduction, a 360-kva. transformer built in 1916 weighed 6,630 lb., while a similar 405-kva. transformer built in 1930 weighed 5,775 lb. This represents a decrease in pounds per kilovolt-ampere of 22½ per cent.

Railway transformers for locomotive and motor car service are similar in design, the only differences being the size and method of mounting. Locomotive transformers are mounted in the cab, while motor car transformers are suspended beneath the body.

Some of the earlier single-phase railways used small oil-insulated self-cooled transformers. Being built between 1902 and 1906, before the advent of welding, cast-iron tanks were standard practice, with vertical ribs cast on the outside of the case. Since the transformers had to be mounted under the car, a long low tank was necessary. Using the standard shell-type construction, the transformer coils were placed in a horizontal plane.



Typical preventive coil of modern design

Though this simplified the connections and made it possible to bring the leads out through the cover where there was least chance of oil leakage, it made the oil duct horizontal and retarded natural oil circulation.

As the horsepower of the motors increased, space limitations would not permit the use of natural cooling for the larger transformers required. With the adoption of 11,000 volts on the contact line, the air blast transformer was chosen. For a given rating the air-blast transformer, including its blower and blower motor, is smaller and lighter than any other type for this voltage class. Also, with the air blast transformer the leads may be located where most convenient to the car wiring.

On the first New York, New Haven & Hartford installation, each motor car had its own air-blast transformer, rated at 450 kw., single phase, 25 cycles, 11,000 to 648 volts at full load. A number of taps gave lower voltages for acceleration points and for the compressor and blower motors, heaters and lights. To keep the reactances approximately the same on all taps, the low-voltage winding was designed with full voltage per group of coils and all groups were paralleled by connecting similar leads to a common bus bar instead of being wound with full current per group and all groups in series. This practice still is standard in this country.

Insulation design of the early railway air-blast transformers was based on stationary practice. Since the accumulation of dirt, a large part of which is brakeshoe dust, is inherent to railway service, either its entrance had to be prevented or the transformer designed to withstand a reasonable amount. The latter course was chosen as the more reliable and the electrical clearances considerably increased.

Coils of the earlier transformers were wound of double cotton-covered copper conductors with heavy paper insulation between turns, then pressed to size and taped. After treatment in insulating compound they received more layers of cotton tape and further treatment in compound. The finished coil had good dielectric strength but was weak mechanically. The spacing strips would settle into the tape, practically closing the air ducts.

Some improvement was made by a final treatment in insulating varnish after putting on the last layer of tape, and the method was used for several years.

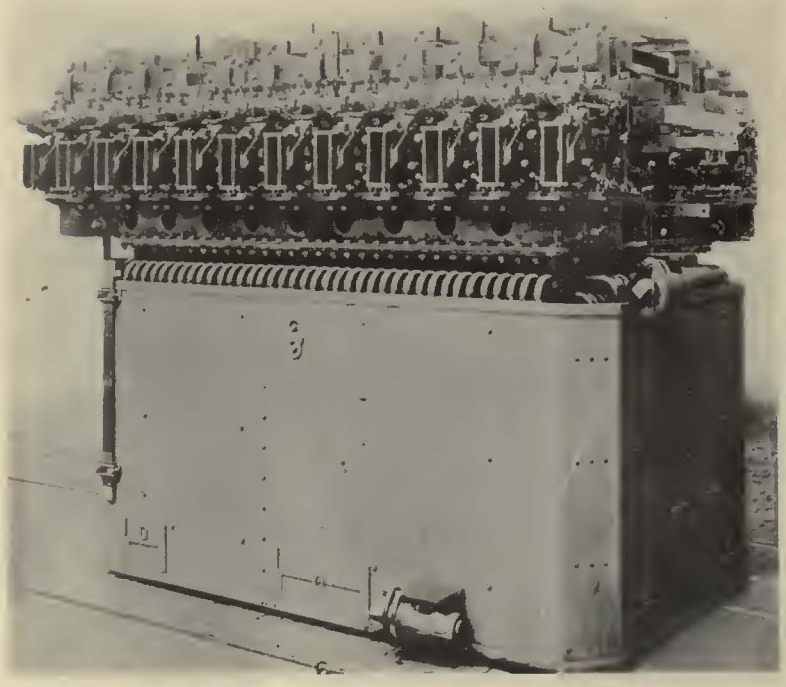
About 1913, treatment of the coils in synthetic varnish was started. By 1917 the practice was adopted which has become standard. The coils are wound with heavy insulation between turns. They are pressed to size and treated according to the following method: (1) dipping in synthetic varnish; (2) pressing between steel plates and baking; (3) wrapping with several layers of cotton tape; (4) dipping in synthetic varnish; (5) pressing between steel plates, with a layer of paper on each side to give a smooth surface, and baking; (6) dipping in clear varnish enough times to give a good gloss, baking after each dipping.

Coils of modern transformers are separated by wavy spacers, and are assembled in groups surrounded by the well-known box-type fullerboard insulation. The wavy spacers support each conductor, but allow the cooling air to come in contact with both sides of each coil. One or more fullerboard washers give ample insulation strength between high and low voltage coils and between coils and iron. Wavy spacers placed all around the coil assembly provide air ducts for cooling the iron. The coils are braced to withstand the mechanical strain of a short circuit on any low-voltage tap with full voltage maintained on the high-tension winding. To seal and weatherproof the coils and insulation, the assembled transformer is given several dips in varnish and is baked after each dipping, thus cementing the component parts into one solid mass. The disadvantage of somewhat increased cost of repair is more than overcome by the prevention of independent vibration, reduction in noise, and lessened likelihood of loosening of parts when subjected to the continuous vibration incident to railway service.

Laminated-steel punchings, insulated to reduce eddy current losses, always have been used for the magnetic circuit. The corners are cut off so as to maintain uniform cross-section of the magnetic circuit and to provide a place for tie rods. At first the magnetic circuit was entirely covered by a metal housing bolted to the end frames as a protection against the weather. When the practice of dipping the complete transformer in baking varnish was adopted, the metal housing over the punchings was no longer necessary.

In 1923 some of the railways wished to provide for future increase in trolley potential to 16,500 or 22,000 volts. For this voltage class, the insulation clearances for air transformers become large, thereby increasing the dimensions and weight to such an extent that an oil-insulated, forced-cooled transformer will have approximately the same weight and dimensions and a somewhat greater thermal capacity.

Transformers supplied to the Virginian Railway are typical of this development. These are rated 2,350 kva., 25 cycles, single phase, with high voltages of 11,000 or 22,000 and low voltage of 1,500 with the necessary notching taps. The core and coils are similar to those of any standard oil-insulated transformer, except for dipping in varnish, and more elaborate core bracing. A false cover or baffle plate mounted inside the case slightly below the oil level prevents splashing. The leads pass through this cover through bushings, and current transformers and other auxiliary apparatus are mounted on it. Both the oil inlet and outlet are at the bottom of the tank and piped on the inside, so that the cold oil enters at the bottom of the tank near the center and the hot oil is drawn from the top. The hot-oil outlet pipe is at the side of the case just far enough below the minimum oil level to prevent its being out of the oil when the locomotive sways or goes around a banked curve. The transformer is cooled by forced circulation of 117 gal. of oil per minute through a suitable radiator, which, in turn, is cooled by a blast of 6,000 cu.ft. of air per minute.



European transformer of 2,250-kva. rating for use on 15,000-volt system

Preventive coils, which are used in connection with control equipment to permit change from one control tap to the next without interrupting the current, are small auto-transformers. The first ones, being small, were self-cooled and the coil ends were totally inclosed with end bells. As the capacity of the preventive coils increased, screens were inserted in the end bells, allowing air to circulate around the ends of the coils. With further increase in capacity it was necessary to resort to artificial cooling, and since blowers were available, the air blast type was used. The forming and treatment of the coils, and the assembly and treatment of the insulation, are the same as those of the main unit.

European practice tends toward higher trolley voltages, and so oil-insulated, forced-cooled, air blast transformers are used extensively. A recent typical transformer of this type is rated 2,250 kva. in summer and 2,650 kva. in winter, the additional capacity being used for train heating. It is single-phase, $16\frac{2}{3}$ cycles, 15,000 to 629 volts, with suitable notching taps. This transformer is of the shell type of construction and the main transformer and three preventive coils are placed in the same tank. The switch groups and all connections are mounted on top of the tank cover. The tank is of welded boiler plate with external cooling tubes.

Interlocking connections at the Hammersmith Station in London are controlled from this board

London Underground Railway

Modernizes Signal Equipment

Alternating-current equipment replaces the old d.c. system. New type of interlocking tower adopted to facilitate inspection

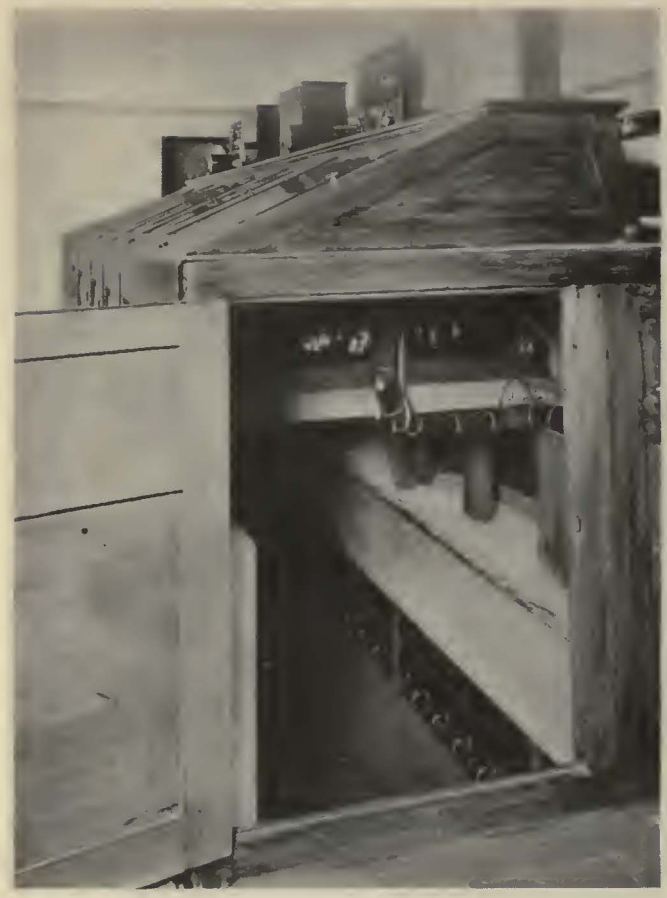
MODERNIZATION of signaling equipment on the London Underground Railways has been in progress for some time. The work involved includes replacement of the original direct-current track circuit apparatus by alternating-current apparatus of the condenser fed type. All relays are being equipped with removable tops fitted with spring-loaded terminals, the bottom portion of which makes contact with studs on the fixed top of the relay. These tops, by means of which a relay can be changed without interference with its wiring, were developed on the underground railways in order to avoid delays. While the change of a relay due to a faulty contact is very infrequent, the delay to traffic is serious with a 1½-minute train service, particularly on the tube railway sections where a man cannot remain in the tunnel while trains are running. With the removable top a relay can be changed in 30 seconds without errors in wiring which are liable to occur where many wires have to be transferred. These tops, introduced in 1927, have been of such benefit that they have been adopted as standard.

Circuit breaker boxes have been installed at train stops, and wiring alterations have been made to indicate that signals and train stops have correctly operated to danger.

Power interlocking frames have been completely overhauled, including replacement of all contacts by an entirely new and improved type, whose contact portions are chromium plated and polished. These are surrounded by bakelite partitions and slotted bases to prevent any pieces of wire or other metal lodging across the contacts and completing a circuit incorrectly. Visuals are also provided for the signal and point levers, and where a train stop is operated by a move from the opposite direction, a visual is also provided.

Relay rooms are being rewired, and in several of them new-type metal relay racks are installed. Care has been taken to improve the run of cables and to make the wiring neat and orderly to assist general maintenance and reduce the possibility of accumulation of dirt.

In connection with the western extension of the Piccadilly Railway, now being constructed, and the consequent alterations to the platform at Hammersmith, a new signal cabin was built, incorporating the latest developments. On account of the limited area available alongside the tracks, the new two-story cabin has been built on top of the adjoining retaining wall on the south side of the Metropolitan District Railway westbound platform. The top floor comprises the signal cabin, linemen's depot, lavatory and a small locker room. The



Access to a gallery beneath the board is obtained through a door in the end of the cabinet

The relay room is directly beneath the signal cabin. A ladder leads to the gallery below the control board

lower floor is used as a relay room. The building is of a different design from the usual signal cabin, the amount of window space being considerably reduced. The center window projects so that the signalman can, if necessary, look out in either direction.

The interior of the cabin is finished with tiles with filleted corners at the bottom of the walls and round the frame. The frame casing has been extended to form a booking desk and to accommodate the telephone switchboard, as well as to cover over the entrance to a platform under the locking frame.

The Underground company some years ago developed the plan of providing an opening in the floor of the cabin under the locking frame, with a platform below so that the maintenance men might stand upright, thus facilitating maintenance of contacts, magnets, etc. This platform is also reached by steps from the relay room. The arrangement is now incorporated in all signal cabins where practicable.

The locking frame at Hammersmith was an old one rebuilt for the purpose. The leg castings were dispensed with, and the sections fixed on steel joists, with the ends supported at the back of the frame by means of a wall built up from the cabin floor and tiled on the outside.

The switchboard for various signaling main cables is in the signal cabin portion of the building, but no live parts are exposed. The back of the board with the connections is in the adjacent linemen's depot and is covered by a cabinet. This result is made possible by the use of "back of board" switches with operating handles on the front. In the lower portion of the board are four circuit breakers of the Igranic type for the cabin transformers and ring mains. The signalman cannot trip them, but is able to reset them if they are tripped.

Considerable thought was given to the arrangement of the relay room fittings, especially in connection with fire prevention and with a tidy arrangement of cables and wiring. The relay racks are accessible from each side and have been designed to give as little area as possible for the settlement of dust. The uprights are formed of angles. On the horizontal bars attached to them are screwed cross-pieces for supporting the relays. The underside of this support is bent to carry the U-shaped supports to which the removable tops of the relays can be hung when it is necessary to change a relay.

The wires are taken along the back of the rack in aluminum hooks, and the wires lead down to one side of the relay top and lie flat, the ends of the wire at the terminal being covered by a small insulating collar. Relays on the shelves are of different colors, in accordance with a standard coloring scheme adopted by the company, so that a relay can be immediately recognized as to its operating voltage and class, i.e., track, line or point indication.

The fuses are supported on small section channels, the racks being sloped in order to economize space by giving the greatest accommodation either at the bottom or top as required by the incoming or outgoing cables. A number of the track circuits in the vicinity of the cabin are fed from the cabin through isolating transformers and condensers which are housed in the relay room.

The work of changing over from the old cabin to the new one was carried out in one night of about six hours without any delay or rearrangement of traffic. All the work was carried out by the company's own staff.

Analysis of Maintenance Costs on 43 Properties

Operating

287,082,000 Car-Miles

and

58,595,000 Bus-Miles

EXPENDITURES for maintenance consume a large part of the revenue obtained by the electric railways every year. If the maintenance dollar could be made to accomplish more than it does at the present time, a large sum would be added to the net income of the industry. It is for this reason that an analysis of the data submitted by 43 electric railways in the competition for ELECTRIC RAILWAY JOURNAL'S Maintenance Contest Award for excellence in maintenance work during the year 1930 is presented here. No attempt is made to draw any definite conclusions from the figures presented nor to show any relation between cost and performance, or any of the other factors considered, but it is believed that they are worth careful study from which individual companies can make their own comparisons and conclusions. To the companies which are scrutinizing their maintenance costs as a result of the present demand for a reduction in expenditures, this information should serve as a valuable guide, and a check for any cost analysis they may undertake. The information compiled does not cover the entire industry, but it does cover a good part of it, as indicated by the comparisons in the first table. The average figures obtained are close approximations to those for the industry as a whole. It is believed that this detailed compilation of maintenance costs is the largest in size and number of operations that has been made in recent years.

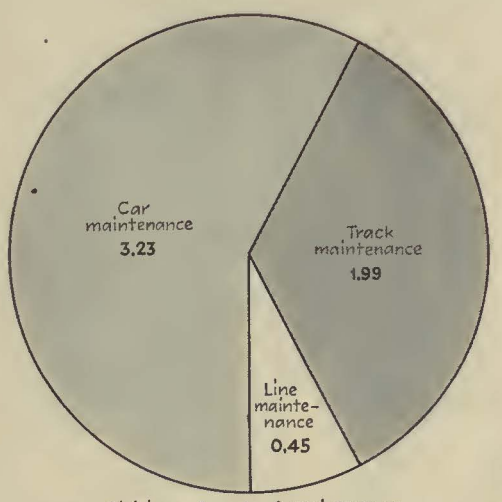
During 1930 electric railways spent more than $214,000,000 for maintenance of way and of equipment, this figure representing about 21 per cent of the total gross revenue. Viewing this large item of cost in another light, of the 7.77 cents collected for each fare, using A. S. Richey's figure for the average fare in the United States during 1930, 1.63 cents was needed to meet the cost of maintenance. With the magnitude of these figures in mind, possible savings to the industry resulting from a careful cost analysis of maintenance work by all companies loom large.

The range of the variations of cost for the companies in the contest is clearly shown in the charts. They appear large enough to make us believe that some companies are not getting the full value of their maintenance dollar. Why should there be differences of as much as 300 per cent between the low and high figures in these various items of maintenance cost? If some companies have been able to reduce their cost to a low figure, other companies should be able to approach that figure. That there are uncontrollable factors that enter into the cost of some companies is realized. These may be differences in wage rates, local conditions, franchise requirements, etc. Nevertheless, a careful cost analysis of maintenance expenditures would show up leaks in the maintenance budget of many companies.

A cost analysis of itself will not reduce maintenance expenditures, but it will show how to accomplish a reduction by indicating where each maintenance dollar is spent, and what it is accomplishing. Comparisons with results achieved by other companies in the industry will point out where any company is falling behind the general average for the industry. A decrease of 10 per cent in the industry's bill for maintenance, achieved by more efficient methods and a better use of facilities, would result in a saving of $21,000,000 to the electric railways. Such a saving would well repay any effort the industry might make in arriving at this goal.

With the idea of broadening the scope of the maintenance contest which has been conducted by ELECTRIC RAILWAY JOURNAL since 1927, it was decided to base the company awards in 1931 on data showing the general character, quality and cost of the maintenance work done by the various companies in the industry during the calendar year 1930. The information requested was divided into four groups, these being car maintenance, bus maintenance, track maintenance and overhead line maintenance. From this information, the judges were able to make a comparison of the results accomplished. The award for the year 1930 was made to the Georgia Power Company, Atlanta division. A feature article describing the maintenance methods of that company was published in the November issue.

The 43 companies entered in the contest form a good cross-section of the entire industry for comparative purposes. They are



Division of cost of maintenance for electric railway operation. Total is 5.67 cents per car mile

Synopsis of Data for the Year 1930 of All Companies in Maintenance Contest

Car Maintenance

Number of companies	43
Passenger cars owned	11,189
Per cent of passenger cars owned by all electric railways	14.3
Average age of cars, years	14.5
Estimated average age of cars owned by all electric railways, as of January, 1931, years	19.5
Car-miles operated	287,082,000
Per cent of car-miles operated by all electric railways	12.9
Weighted Average Cost of Car Maintenance, Cents per Car-Mile	3.23‡
†Average cost of car maintenance for 201 companies, cents per car-mile	3.05‡
Average car-miles per pull-in for 39 companies	18,726
Cars overhauled	5,082
Per cent of total number of cars owned	46.4

Bus Maintenance

Number of companies operating buses	30
Buses owned	1,862
Per cent of buses owned by all electric railways	13.8
Average age of buses, years	3.7
Estimated average age of buses owned by all electric railways	3.9
Bus-miles operated	58,595,000
Per cent of bus-miles operated by all electric railways	14.7
Weighted Average Cost of Bus Maintenance, Cents per Bus-mile	5.12‡
†Average cost of bus maintenance for 80 companies, cents per bus-mile	4.47‡
Average bus-miles per pull-in for 25 companies	4,554
Buses overhauled	831
Per cent of total number of buses owned	44.6

Track Maintenance

Number of companies	43
Miles of paved track	2,933
Miles of open track	2,200
Total miles of track	5,133
Per cent of total miles of track for all electric railways	11.8
Miles of track completely reconstructed	111.61
Per cent of total miles of track	0.26
Miles of paved track reconditioned	216
Miles of open track reconditioned	142
Miles of new rail laid	74.57
New ties laid in open track	296,088
Weighted Average Cost of Track Maintenance, Cents per Car-mile	1.99‡

Overhead Line Maintenance

Number of companies	43
Miles of trolley wire	5,133
Miles of trolley wire renewed	281
Per cent of total miles of trolley wire	5.47
Average trolley wire breaks per 1,000 car-miles	0.0921
Average trolley wire breaks per 1,000 kw.-hr.	0.0386
Weighted Average Cost of Line Maintenance, Cents per Car Mile	0.45‡

†Statistics compiled by the American Electric Railway Association.
‡Does not include depreciation.

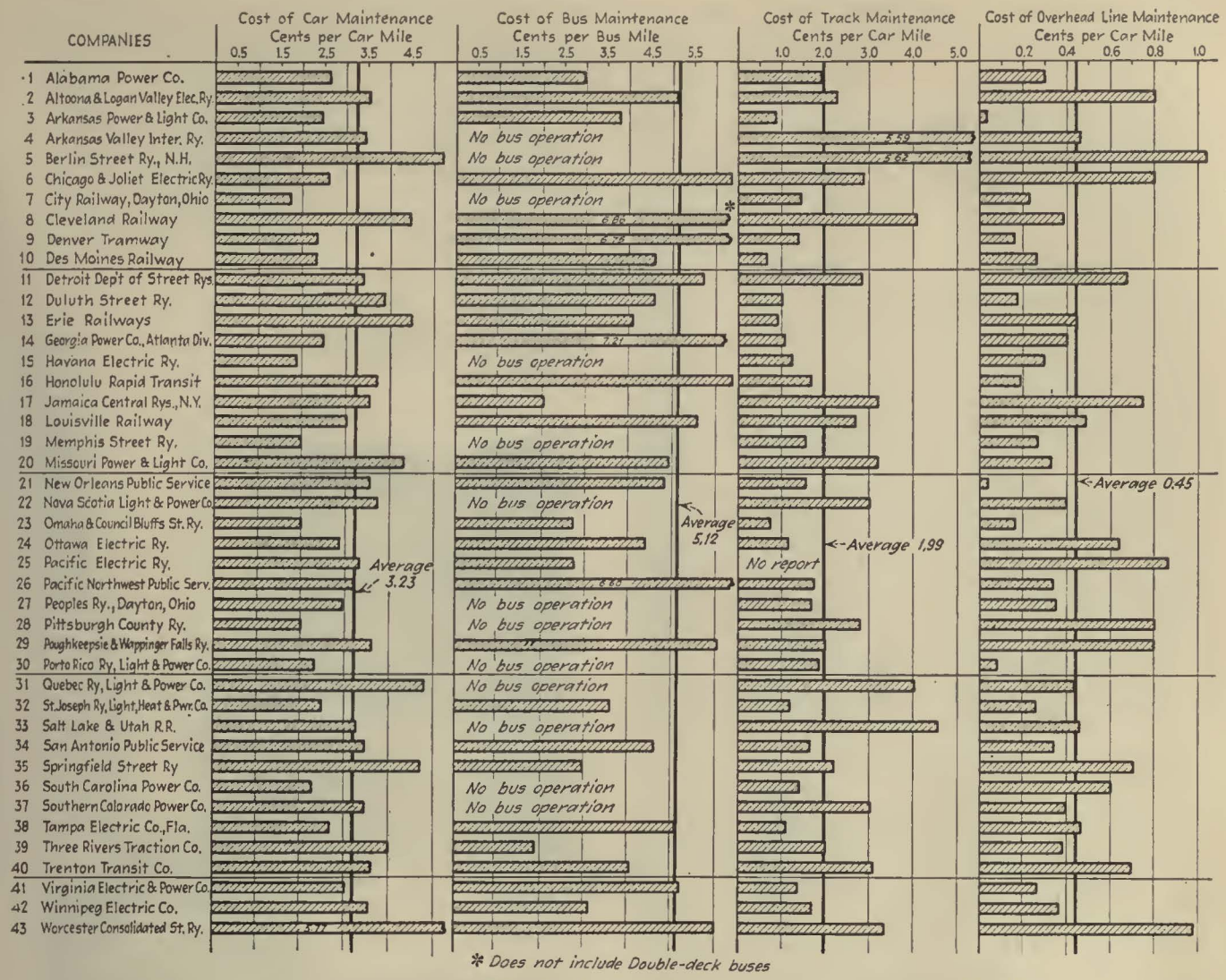
located all over the United States with several in Canada and one in Cuba. Their operations constitute 13 per cent of the car-miles and 15 per cent of the bus-miles operated by the entire electric railway industry during 1930. Of the 43 companies, 30 operate buses.

The information requested by the judges included the following: For car maintenance—cost of car maintenance per car-mile, total car-miles operated, average car-miles per pull-in, per cent of total active cars overhauled, bases of inspection, of overhaul, of painting, and of general cleaning, and average age of cars in service; for track—cost of track maintenance per car-mile, total mileage of open track, percentage of open track reconditioned during the year, total mileage of paved track, percentage of paved track reconditioned, mileage of track completely reconstructed, mileage of new rails laid, and number of new ties installed in open track; for overhead lines—cost of overhead line maintenance per car-mile, trolley wire breaks per 1,000 car-miles, trolley wire breaks per 1,000 kw.-hr. of energy consumed, and per cent of trolley wire renewed during the year. Information was requested for bus maintenance along the same lines as was requested for car maintenance. Most of this information, compiled for all the companies as a group, is shown in the table above with pertinent figures for the industry as a whole.

Included in the cost of car maintenance per car-mile were the accounts Nos. 29, 30, 31, 32, 33, 36, 37, 38, 39, 70 and 71. Depreciation was not included in either the cost of car maintenance or of bus maintenance. The weighted average cost of car maintenance in cents per car-mile for the 43 companies is 3.23. The figure for bus maintenance for 30 companies is 5.12. These costs are shown in the chart by companies.

The pull-in records for each company are shown in the last table. For the purpose of this contest a pull-in was described as any vehicle which was removed from service prior to the completion of its regular run, for any mechanical, electrical or man-failure or accident. If pull-ins were recorded on a different basis an explanation was requested. The relation between the car-miles per car pull-in and the bus-miles per bus pull-in is of interest. The ratio is about 4:1. In other words, for every mile a bus operated without interruption to service, the electric car operated 4 miles.

The figure on average age of passenger cars, shown in the first table, is also interesting. The average age of passenger cars operated by the companies in the contest is five years less than the average age of passenger cars owned by all electric railways, as in January, 1931. The latter figure was obtained from the best information available. A nation-wide survey on the age of passenger cars owned by all electric railways was published in Electric Railway Journal of Jan. 2, 1926. This information was brought up to date by statistics of new cars purchased and cars junked by the electric railways since that time. Likewise, the figure for the average age of buses was obtained from annual statistics of new buses purchased and buses junked. Here the difference between the average age for the industry and the aver-



Maintenance costs shown for all companies in the contest. Average costs represent weighted averages

age age for the companies in the contest is only 0.2 year.

In compiling the information on the basis of inspection for cars and buses, it was revealed that very little uniformity existed in the practices of the electric railways in this work. There appears to be equal non-uniformity in the bases for car maintenance and bus maintenance. Answers to these questions are given briefly. Car maintenance will be taken first. Inspection of cars was done by twenty companies on the basis of elapsed time, of mileage by eighteen companies and of energy consumed by one company. In the first group nine companies reported inspections every seven days, three companies daily, three companies every three days, and two companies every eight days.

In the second group fourteen companies reported inspections every 1,000 miles.

The basis of car overhaul was reported by twenty companies as miles operated, and by twelve companies as elapsed time. In the first group twelve companies overhauled cars between 50,000-75,000 miles, three companies at 80,000 miles and two companies at 40,000 miles. In the second group four companies overhauled their cars every 24 months, and two companies between 18 and 24 months. The variations in this group range from 6 to 36 months. The variations in the mileage group range from 40,000 to 120,000 miles.

Car painting was done on a basis of elapsed time by 28 companies, and on a basis of miles operated by four companies. Five companies report no definite period for painting. In the group of elapsed time, twenty companies painted cars in periods of 18 to 24 months. Three companies reported painting every 30 months. The variation in this group ranged from seven months to three years. The variation in the mileage basis of painting ranged from 40,000 miles to 90,000 miles.

Car cleaning was done on the basis of elapsed time by 22 companies and on a basis of mileage operated by five companies. In the first group six companies cleaned cars every day, five companies every seven days, and three companies every three days. The variations ranged from 1 to 30 days. The variations in the second group ranged from 1,000 miles to 5,000 miles.

Buses were inspected on the basis of miles operated by seventeen companies, and on the basis of elapsed time by seven companies. In the first group nine companies inspected buses every 1,000 miles, and five companies every 2,000 miles. Variations ranged from 750 miles to 10,000 miles. In the second group three companies inspected buses daily and three companies weekly.

Basis of overhaul of buses was miles operated for fifteen companies, and elapsed time for five companies. In the first group four companies overhaul buses every 50,000 miles and four companies between 50,000-75,000 miles. The variations ranged from 25,000 to 100,000.

Pull-in Records and Trolley Wire Breaks

Company	Average Car-Miles per Pull-in	Average Bus-Miles per Pull-in	Trolley Wire Breaks per 1,000 Car-Miles
1. Alabama Power Company	17,100	0	No report
2. Altoona & Logan Valley Electric Ry.	4,708	2,844	0.01600
3. Arkansas Power & Light Co.	18,020	4,718	0.00454
4. Arkansas Valley Interurban Railway	No report	.....	0.00360
5. Berlin Street Railway, Berlin, N. H.	No report	.....	0
6. Chicago & Joliet Electric Railway	2,700	1,200	0.00800
7. City Railway, Dayton, Ohio	4,576	.....	0.01700
8. Cleveland Railway	2,225	2,630b	0.00082
9. Denver Tramway	6,146	1,363	0.00254
10. Des Moines Railway	6,270	3,340	0.00390
11. Detroit Dept. of Street Railways	11,710	49,408	0.00242
12. Duluth Street Railway	2,348	No report	No report
13. Erie Railways	6,500	4,000	0.00001
14. Georgia Power Company, Atlanta Div.	142,678	2,883	0.00099
15. Havana Electric Railway	6,206	.....	0.01254
16. Honolulu Rapid Transit Co.	27,878a	3,380	0.00130
17. Jamaica Central Railways, N. Y.	1,309	5,195	0.00694
18. Louisville Railway	6,085	2,570	0.00496
19. Memphis Street Railway	27,923	.....	0.00246
20. Missouri Power & Light Co.	No report	No report	0.01000
21. New Orleans Public Service	162,905	No report	0.00083
22. Nova Scotia Light & Power Co.	2,014	.....	0.00150
23. Omaha & Council Bluffs Street Ry.	2,329	1,977	0.01800
24. Ottawa Electric Railway	2,145	2,264	0.00224
25. Pacific Electric Railway	24,652a	6,741	0.00345
26. Pacific Northwest Public Service Co.	4,838	1,454	1.61000
27. People's Railway, Dayton, Ohio	6,221	.....	0.00001
28. Pittsburg County Railway	15,300	.....	0.04680
29. Poughkeepsie & Wappingers Falls Ry.	No report	No report	No report
30. Porto Rico Railway, Light & Power Co.	19,567	.....	0.00161
31. Quebec Railway, Light & Power Co.	1,566	.....	0.00800
32. St. Joseph Ry., Light, Heat & Power Co.	7,260	1,473	0.02740
33. Salt Lake & Utah Railroad	100,464a	.....	0.00055
34. San Antonio Public Service Co.	8,099	2,392	0.00023
35. Springfield Street Railway	1,800	2,400	1.20000
36. South Carolina Power Company	12,000	.....	0.00670
37. Southern Colorado Power Company	16,631	.....	0.01500
38. Tampa Electric Company	4,497	2,177	0.02050
39. Three Rivers Traction Company	13,143	1,988	0.6000
40. Trenton Transit Company	6,096	2,628	0.01010
41. Virginia Electric & Power Company	19,898	2,468	0.00060
42. Winnipeg Electric Company	2,730	970	0.00392
43. Worcester Consolidated Street Ry.	1,855	1,397	0.00800
Average	18,726	4,554	0.0921

a Pull-ins due to mechanical failures.
b Single-deck buses only included.

In the second group the variations ranged from 6 to 24 months. Bus painting on the basis of elapsed time was done by fourteen companies, and on the basis of miles operated by three companies. In the first group six companies paint buses every 24 months and four companies every twelve months. The variations ranged from 12 to 36 months. The three companies painting buses on the basis of mileage did so between 750,000 and 100,000 miles.

Cleaning of buses was done on elapsed time by 21 companies, and only by three companies on the basis of miles operated. In the first group ten companies cleaned buses daily, four weekly and four monthly. The mileage basis for the other three companies is 1,000 miles.

*Tail Light Warns of Defective Line Switch**

By R. W. James

Electrician
Ottawa Electric Railway

PROMPT indication of frozen contact tips of automatic line switches is had on cars of the Ottawa Electric Railway by wiring the green tail light so that it will burn when two of the contacts are frozen. As all our new cars are equipped with a red and a green tail lights for traffic purposes, this was accomplished by a simple change in the connection of the tail light circuit. Formerly, to determine whether any of the contact tips were frozen, it was necessary to examine the switch, or to notch up the controller with the control switch off. Occasionally repair men would be badly burned when working on a controller without knowing of the de-defective switch.

The connection of the tail light circuit was changed from the R-1 terminal in the controller to the trolley terminal, without interfering with the original purpose of the lights. With this connection, current will flow to the green tail light when there are two line switch contacts frozen. If a car is standing still on the street or in the carbarns with both the green and red light burning at the same time it is an indication that the main line switch is defective. When this occurs repairs are made as soon as possible. All inspectors are instructed to notify the repair department when they see both tail lights burning on a car.

*Bumper Straightener**

By W. R. McRae

Superintendent of Rolling Stock and Shops
Toronto Transportation Commission

Appearance of cars is improved when bumpers are kept in shape with the straightener

USE of a bumper straightener has much to do with the well-kept appearance of the cars of the Toronto Transportation Commission. It is somewhat similar to the ordinary manual rail bender, except that the force is exerted in a reverse direction. The device consists of a heavy horseshoe-shaped steel casting that rests on suitable pads placed against the anticlimber. From the center extends a heavy steel hook that is placed behind the bumper, and force is exerted by the revolving of the ratchet-operated nut that is mounted on the square threaded end of the hook. The whole is mounted on a four-wheel truck, and by turning a screw it can be elevated so as to be used for different heights of car bumpers. One of these handy tools is at each carhouse and one in the shops.

**Submitted in* Electric Railway Journal *Prize Contest.*

High-Speed Motors Require

Special Maintenance Practice

By J. K. STOTZ
Railway Motor Engineer
Westinghouse Electric & Manufacturing Company

RECENT motors for use on trolley buses, W-N drive cars, gas-electric buses, and similar vehicles, differ in several respects from street car motors of standard type. All are spring suspended, run at comparatively high speeds, and have ball or roller bearings. These characteristics introduce several maintenance problems not met in the older moderate-speed motors.

Lubrication of the ball or roller bearings differs considerably from that of sleeve bearings. All of them are grease lubricated, and the consistency of the grease must be correct for the particular bearing inclosure. It must be clean, free from acid and have no tendency to separate at operating temperature. The quantity to be used and the interval between greasings are recommended by the manufacturer, but may be modified for individual needs.

Usually there is more danger in overgreasing than in undergreasing. Excess grease is churned up between balls or rollers in the bearings, with overheating and separation of the grease and some danger of bearing failure. Also, the excess grease is forced out of the bearing through the labyrinth seals or grease overflow, and enough may get inside the motor to damage windings or insulation. Where felt seals are used, the grease pressure may become sufficient to damage the felts.

It cannot be emphasized too strongly that dirt must be kept out of anti-friction bearings. While its presence in sleeve bearings shortens their life to some extent, the oil passes through the bearing to the outside and carries away much of the dirt which may enter the bearing. Dirt that becomes embedded in the babbitt does little or no further damage. But in anti-friction bearings the dirt that enters remains and causes rapid wear. Dirt and grease of poor or unsuitable quality are the things that cause short bearing life. Eliminating these the bearing performance should be satisfactory.

Commutators on high-speed motors, while essentially similar to those of axle-hung motors, have a higher peripheral speed, making it more important that the commutator surface be smooth. Turning and undercutting of the mica must be done even more carefully than on axle-hung motors. Clearance to ground and distance between brush holders is less than on the large motors, making it more important that the V rings be kept free of carbon dust and grease.

High-speed motors tend to have greater friction losses at light loads than the axle-hung motors. To reduce these, it is advisable to use brushes with a low friction co-efficient, and to adjust the brush holders for low spring pressures. This is possible on account of the spring suspension of the motors. With the low spring pressures, somewhat more careful inspection is necessary to insure that the brushes are free in the holders, since little excess pressure is available to overcome friction caused by dirt. Inspection, especially on bottom brush holders, should include removal of dirt particles between the finger and the carbon. Such dirt particles have been known to open this path so that all the current must flow between the carbon and the side of the box with severe burning of the box. This can be avoided by the use of brush shunts where dust is very bad.

A motor with anti-friction bearings must have adequate seals against entrance of dirt and for the retention of grease. This makes the mechanical assembly of the armature in the frame quite complicated. Removal of the armature and particularly of the bearings is difficult unless adequate tools are available. Proper pullers or design drawings of them, as well as section drawings ot the motors showing the assembly, can be obtained from the manufacturers. No attempt should be made to dismantle a motor without such tools and drawings. With proper equipment and knowledge of the maner in which the parts go together these motors can be handled with little difficulty.

Being relatively small these motors require somewhat more care in handling than the axle-hung motors. Bolts are necessarily small and may be stretched or even broken if they are not handled with reasonable care. In assembling parts with press fits it is usually advisable to shrink them on, preferably heating them in oil. Every precaution should be taken to protect the anti-friction bearings from dirt, water and rust while they are exposed. In the factory of one manufacturer, anti-friction bearings which are not assembled in a motor within two hours after unwrapping are either scrapped or returned for cleaning. This standard of cleanliness is necessary to obtain perfect performance of anti-friction bearings.

No special precautions need to be taken in rewinding high-speed armatures except that balance is essential to avoid vibration at the high operating speeds. The armature is balanced dynamically at the factory before winding. Slight unbalance due to the winding is corrected by a second dynamic balancing, the correcting weights being placed on the band wires. When the armature is rewound it will be in dynamic balance except for irregularities in the winding. If the winding is done carefully this unbalance is so small that it may be neglected.

Band stresses in these motors are fairly high, so that when rebanding the same size wire and the same tension as those used originally should be employed. A temporary band should be put on after preheating the armature and the permanent bands placed after the armature is cold and pulled down solidly on the coil supports.

*Cutting Tool for Compressor Pistons**

By A. J. Lee
Master Mechanic
Toronto Transportation Commission

FOR deepening or slightly widening the piston ring grooves on air compressor pistons, the hand tool illustrated here has been designed in the shops of the Toronto

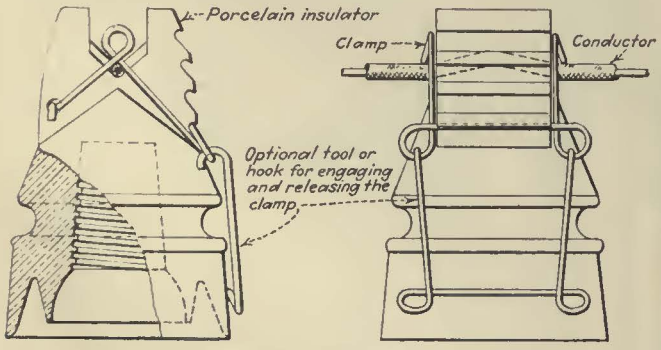
Piston ring grooves can be deepened with this cutter and carbon deposits removed

Transportation Commission. The need for this tool came about when a change was made from rings made by the compressor manufacturer to another type. These were found to be slightly thicker, and when in place did not close up sufficiently to allow the pistons to enter the cylinder. This cutting tool deepens the groove sufficiently to give the required clearance, without the necessity of putting the piston in a lathe. Grooves sometimes become worn sideways, necessitating an oversize ring. This tool has been found useful in standardizing groove width and cleaning out any carbon deposit.

*Pin Insulator with Clamping Device**

By H. G. Engelhardt
Distribution Engineering Department
New Orleans Public Service, Inc.

DIFFERING from the standard porcelain pin insulator only in the shape of the head and in the method of tying in the conductor, a new insulator was recently adopted by New Orleans Public Service, Inc. Instead of having the usual saddle top and side grooves, it has two vertical projections between which is the groove for the conductor. Through the base of one of these projections is a hole for pivoting a spring clamp which holds the conductor. The outside surface of the other projection is notched to engage the free end of the spring clamp. The particular notch to be used depends on the diameter of the line conductor. Any tendency of the conductor to pull out of the insulator engages the clamp tighter in the holding notches.

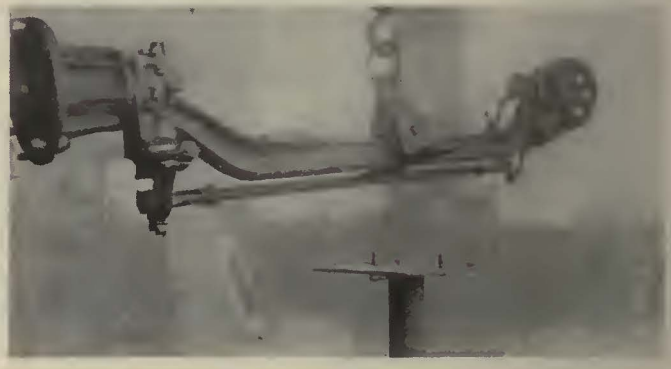


Ease of renewal is one of the advantages of the pin insulator used by New Orleans Public Service, Inc.

The clamp itself is made in one piece of non-corrosive spring bronze. It is attached to the insulator by inserting the pivot end through the hole at the base of one of the projections, and clinching through an eye on the other side. There is practically no labor required in clamping the conductor in place. This is done by merely placing it in the groove and swinging the clamp over and across it, and pulling the free end down to engage the proper notch. No separate tie wires are necessary.

This design also facilitates the removal of defective insulator on a live high-voltage line where "hot sticks" are necessary. Untying and tying the conductors to the insulator with the usual tie wires is always cumbersome and difficult under these conditions. The spring action of the clamp also maintains a tight contact in the insulator at all times, thus eliminating to a great extent the capacity effect between the conductor, tie wire and insulator.

Stand for Axle Repairs



Hoisting axle to stand

REPAIRS to axles of motor buses of the Worcester Consolidated Street Railway are facilitated by the use of a handy stand. The height of the stand permits the mechanic to make the repairs in a comfortable position, and makes every part of the axle easily accessible. The axle is clamped with two L-shape pieces with narrow edges that are made to fit underneath the flanges of the axle. The two pieces are bolted to hold the axle securely and are hoisted to the stand, as shown. The stand has a flat plate with two upright bolts which fit into the holes of the clamping pieces for fastening them to the stand. With this device, a minimum of manual handling is necessary. The axle is picked up from the ground and carried by the hoist to the stand.

Axle mounted on stand and ready for repair

*Submitted in Electric Railway Journal *Prize Contest.*

*Special Wrenches for Electric Couplers**

By Frank Ayerhart
Repairman
Toronto Transportation Commission

Tee wrenches have been developed in Toronto to facilitate repairs to Tomlinson electric couplers

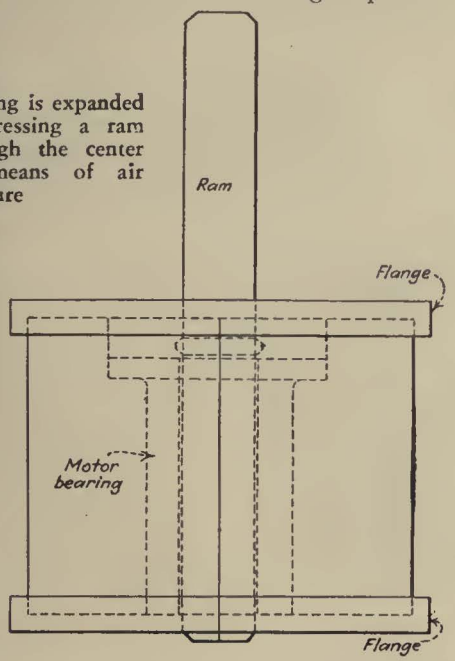
DIFFICULTY was experienced in handling the original style of terminal and contact tips, fitted to the Tomlinson electric coupler block, with gas pliers, screwdriver or many ordinary tools of the repairman. Two T-shaped wrenches were found suitable for these connections. One wrench fits the flats on the contact tip, and the other has the form of a hollow screwdriver, which on the outside engages with the slots in the stud nut. The center is cut back so as to allow the end of the stud to enter far enough when tightening the slotted stud nut. These two handy tools facilitate repairs and prevent damage to the coupler parts by use of unsuitable tools.

Expanding Undersize Sleeve Bearings

By Michael Axler
Interborough Rapid Transit Company

RECLAMATION of undersize motor bearings of the sleeve type is accomplished on the Interborough Rapid Transit Company by the method shown in the illustration. The undersize bearing is placed in a split sleeve with an internal diameter equal to the desirable external diameter of the bearings. Upper and lower flanges are made to fit snugly over the sleeves, and have a hole to allow for the travel of a circular ram as shown. After the undersize bearing has been babbitted, it is placed in the jig and the ram is pressed through the center by means of air pressure. The circular disk of larger diameter at the middle of the ram compresses the babbitt of the bearing, and expands the bearing to have an external diameter equal to the internal diameter of the sleeve. A different jig is required for each size of bearing.

A bearing is expanded by pressing a ram through the center by means of air pressure



Relining Brakes for Greater Bus Mileage

By C. B. Lindsey
Superintendent of Automotive Equipment
Los Angeles Railway

This brake block trimming machine of the Los Angeles Railway eliminates the customary "burning in"

INCREASE in mileage has been obtained from brake drums and linings of buses operated by the Los Angeles Railway by a method of relining brakes used in the shops. This method produces a brake that can be used without the need of "burning in," and will give many miles of service without the need of adjustments.

Brake castings made to our specifications and design are used. Homogeneous nickel cast iron or gun metal has been found most satisfactory, and is easily machined. To reduce distortion and noise vibration, several ribs on the outside and the heavy flange are incorporated in our design. Provision is made for adequate ventilation. When received from the foundries, the castings are rough machined in a heavy lathe, then drilled and mounted on the hub, and finally finished to standard size on a brake drum lathe.

In relining the brakes of a bus, the wheels are removed and brake drums trued up on the lathe. They are then calibrated, and, if needed, new oversize brake blocks are fitted to the shoe heads. If the drums are greatly enlarged heavier cam points are fitted. These are kept in store in several thicknesses. Hinge pins and bushings are checked and replaced if necessary, and the cam is returned to its lowest point. The brake lining is then resurfaced to the correct radius by use of a brake trimming machine.

The brake trimming machine was designed and built in our machine shop. It consists of an old hub to which

**Submitted in Electric Railway Journal Prize Contest.*

has been attached a bracket or tool post, movable to various diameters. The tool holder is also adjustable to accommodate the different brake spiders. The cross feed is driven by a star wheel which can be turned by hand, or fed automatically by clamping a small piece of stock to the fender. When trimming rear brakes, the bus engine is used to turn the machine; when working on buses with full-floating axle shafts, the axle shaft is used as a driver. Adapters have been made to fit the various types of full and semi-floating axles with which our buses are equipped. Only a small amount of material is removed, and a single cutter similar to a lathe tool has been found satisfactory.

The present molded linings and brake blocks are designed for hard wear and long life, and if the correct radius is not obtained when the brakes are relined it will take hundreds of miles of service before there is full contact between the lining and the drum. This condition frequently makes it necessary to raise the air pressure to a point where scored or warped drums result from the increased speed. All this is eliminated by obtaining the correct radius with the device described.

*Cradle for Removal of Wheels and Axles from Cars**

By W. Dillon and T. G. Culham
Toronto Transportation Commission

Hydraulic jack used by the Toronto Transportation Commission to remove wheels with safety

Removal of wheels and axles from the cars of the Toronto Transportation Commission is now accomplished by means of a hydraulic jack that is movable in the pit. The previous method of removing the wheels involved the use of two sets of blocks. A block that was deep enough to get up under the axle between the bearing housings was placed on top of the hydraulic jack, and the wheels lowered until the journal boxes rested on the rail, which had been pulled back sufficiently to clear the wheels. The first block was then replaced by two more stable and lower blocks which gave the axle a safer seat.

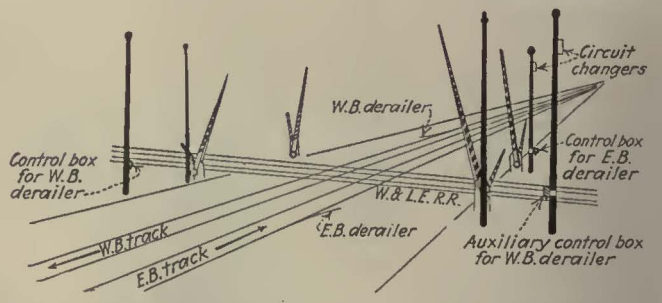
By using the illustrated cradle, the work of changing wheels was much simplified. The wheels can be dropped in one operation, and the work is done more safely.

The cradle is made of wood, having a vee block at one end to take the axle, and a rest at the other end on which the gear sits. Separate cradles are used for axles of different types of motors, owing to gear and wheel variation.

**Submitted in* Electric Railway Journal *Prize Contest.*

*Electrically Controlled Derailer**

By E. B. Spenzer
Special Work Engineer
Cleveland Railway



Each derailer has its control box on opposite side of crossing

Prior to this year, all derailers at railroad crossings of the Cleveland Railway were of the mechanical, hand-operated type. These derailers required considerable maintenance and, during the winter, it was necessary frequently to block the points because of frozen channel boxes and pullrods. For the purpose of improving these conditions, two electrically operated derailers have been developed and installed at a crossing.

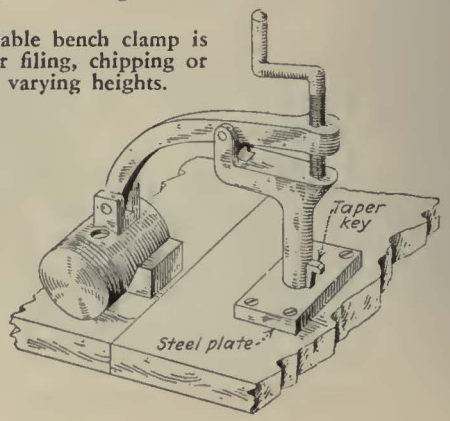
Each derailer is a standard 100-ft. radius switch connected to an electric switching device at the curb on the far side of the railroad tracks. To manipulate it, the operator pulls the handle of the control box toward him. This breaks the circuit and closes the switch point, which opens when the handle is released. The auxiliary control box, which is placed on the same side of the crossing is designed to be used during the morning and evening rush periods by an operator stationed at the curb.

The cost of installing these electrical derailers compares quite favorably with the older types, while the maintenance charges are confined to regular inspection. The performance has been so satisfactory that it has been decided to replace the old type with the newer models whenever a renewal is necessary.

Adjustable Bench Clamp

Handy for filing, chipping or fitting pistons or other similar parts at varying heights is the device illustrated. Like all simple devices it will be found helpful in many shop operations. It can be fastened to a work bench through a steel plate by means of a taper key or wedge. The clamping height can be varied by turning the threaded handle. The maximum height can be increased by increasing the threaded portion of the handle.

This adjustable bench clamp is handy for filing, chipping or fitting at varying heights.



NEW PRODUCTS *for the* Railways' Use

Latest 40-passenger trolley bus developed by J. G. Brill

Forty-Passenger Trolley Bus

PROPER load distribution, simplified control, easy steering and light weight with speed and safety, were considered the outstanding features to be obtained when the J. G. Brill Company began the development of its 40-passenger trolley bus.

The seating arrangement of this vehicle consists of ten cross-seats with individual backs, located in the center portion of the body, and three longitudinal seats over the wheel-housing. A 2-passenger cross-seat is opposite the treadle exit door and a 5-passenger longitudinal seat sets against the rear dash.

Twelve double-coil heaters are the source of heat for the interior. One extra-capacity cab-type heater, controlled from a separate snap switch is placed in the front vestibule.

Two 50-hp. motors drive the vehicle through double worm gearing housed in the double-bowl rear axle. Each motor drives one wheel through its own propeller shaft and gearing. Two driving units, a recent design of hour glass worm and worm wheel type, are mounted on tapered roller bearings in oil-sealed housings. The propeller shafts are connected to the motor and driven through two oil-sealed universal couplings per shaft.

The control apparatus is placed under the floor of the vehicle. It is pedal operated, selective, automatic accelerating, remote type, and is wired in circuits with the motors. The motors are connected in parallel, and are placed between the two longitudinal center sills. The controller and reverser box is in front of the motors.

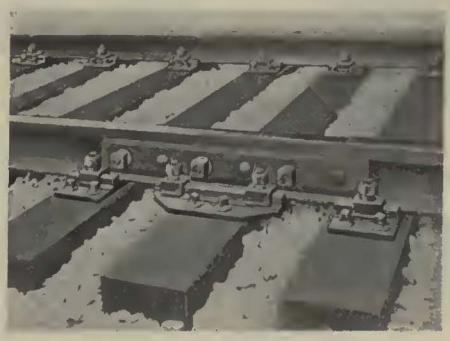
Four-wheel automotive internal-expanding drum-type brakes are operated by standard railway air-brake equipment, actuated by a foot pedal. The body is spring mounted on Timken axles developed especially for trolley buses.

Weights and General Dimensions

Weight of complete bus	18,260 lb.
Weight on rear wheels	10,956 lb.
Weight on front wheels	7,304 lb.
Length over bumpers	31 ft. 6½ in.
Height from ground to step, front	15 in.
Height from ground to step, rear	16 in.
Over all width of body not to exceed	96 in.
Aisle width	20⅜ in.
Seat length	34 in.
Seat centers	28¾ in.
Post spacing	37⅜ in.
Turning radius	35 ft.
Wheelbase	192 in.
Tread, front	81¼ in.
Tread, rear	74 in.
Front overhang	82 in.
Rear overhang	89 in.
Minimum road clearance under rear axle housing	10¼ in.
Cruising radius, each side of wire	9 ft.

Rail Fastenings Simplify Renewals

RAIL renewals can be made without disturbing the ties or ballast in the GEO type of track construction introduced in this country by the Carnegie Steel Company. The fundamental differences between the GEO type of track construction and the construction generally used in the United States lie in the design of the plate, method of fastening the tie plates to the tie, method of fastening the rails to the tie plates and the use of a treated and compressed wood shim with each plate.



One-tie supported joint plate in track

The intermediate tie plate assembly consists of a double-shouldered rolled-steel plate, two 3-in. U-shaped rolled-steel clamps with bolts, two spring washers, one wood shim and the four screw spikes, which hold the plate to the tie, independent of the rail fastenings. Slots are milled in each shoulder of the plate, and the clamp bolts are made with heads of the same contour as the slot in the shoulders. The joint plates are of the same section and can be made for either the suspended or supported type of joint.

Assembled intermediate plate

Compressed wood shims are placed between the rail and tie plate. These shims are made from poplar, compressed and creosoted. They are of the same width as the base of the rail, and in length overlap the edge of the tie plates ¾ in. on each side.

The two-tie suspended plate is approximately 27 in. long, and the one-tie supported plate is approximately 16 in. long. Both have four rail clamps.

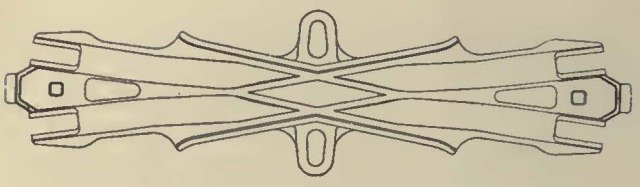
This type of track construction was developed in Germany primarily for steam railroad tracks but it has been found satisfactory in interurban track construction. About 8,000 miles of this type of track has been constructed in Germany. Claims made for the GEO track are longer life of ties by minimizing mechanical wear, longer life of rail, less wave motion, elimination of rail creeping, absolute maintenance of gage, and a better joint construction.

Trolley Bus Line Material

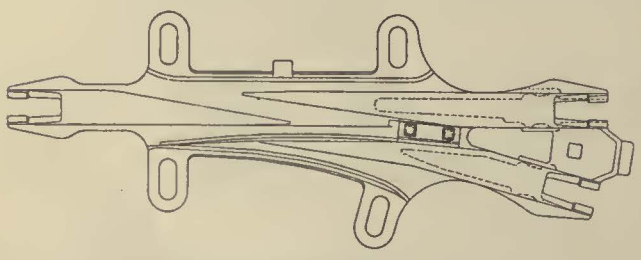
Developed by the

Westinghouse Electric & Manufacturing Company

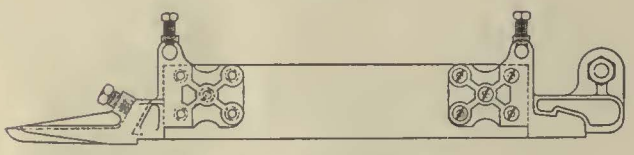
Ball and socket hanger



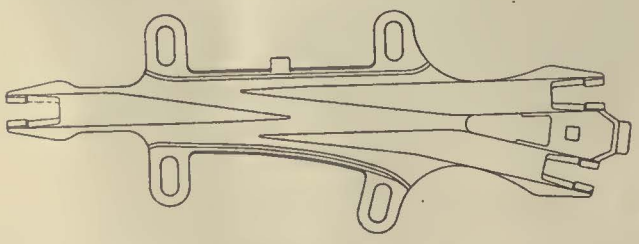
15 deg.-23 deg. angle crossing



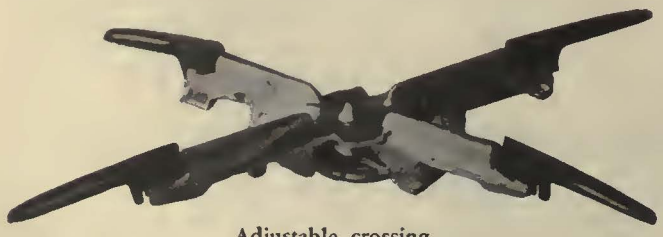
Spring frog



Single-beam section insulator



Overlapping runner frog



Adjustable crossing

Swivel polehead

TANGENT LINE

Frequently the trolley ear does not hang vertically because the cross-span tension is limited. This causes a tilting of the trolley car. A ball-and-socket hanger permits the ear to hang vertically.

CONVERGING OF TROLLEY BUS LINES

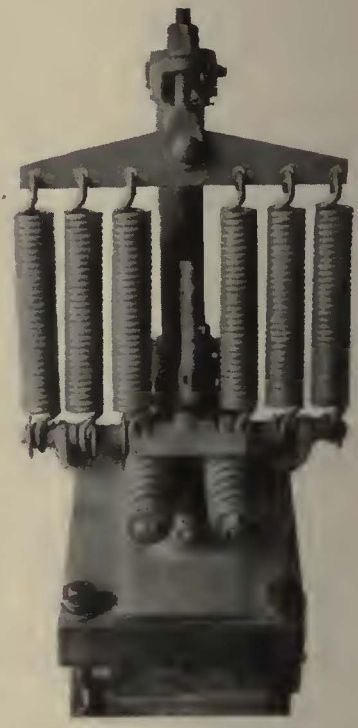
Where two lines converge into a common line, an acute-angle crossing, two overlapping runner frogs and section insulators are used. At the crossing, a swivel polehead does not insure positive operation for acute angles on standard railway frogs. The double-angle crossing, which has a 15-deg. angle at the throat and a 23-deg. angle at the overlap, is a method of making crossing without using movable parts. It prevents jamming of the collector at the overlap. The overlapping runner frog permits the collector to ride on the tongue instead of on the pan. It is a duplicate of the one used for railway construction. The single-beam section insulator is rigidly attached to the frog.

DIVERGING OF TWO TROLLEY BUS LINES

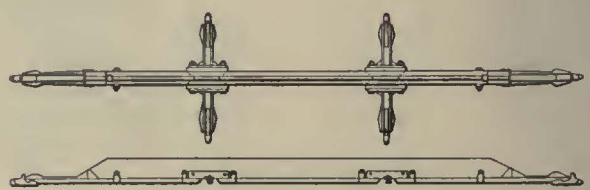
An electrically operated tongue frog is required for positive operation at turnouts. Tongue movements are made by electrical equipment actuated by "power on" and "power off" applications by the bus operator. A mechanical connection is made to a corresponding frog tongue in the adjacent wire.

WYES

In wye construction, where a bus moves forward and backs for the turn, the direction followed by the swivel polehead is fixed by overlapping runner frogs with a guiding spring that snaps and returns on entering the frog, thereby assuming the correct position for leaving the frog.



Trolley bus collector base



Double-insulated crossing

CROSSINGS WITH BOTH LINES INSULATED

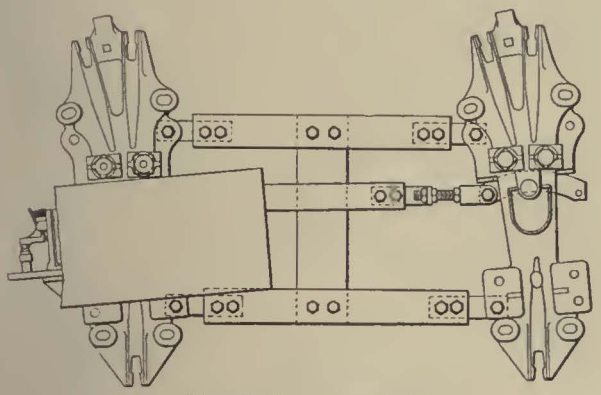
When the negative contact wire is insulated at crossings the trolley buses must coast under these crossings. Rigid or adjustable metallic crossings, duplicates of those used in railway construction, may be used, depending on the crossing angle. Two wires are continued through without a break while the remaining wires are terminated in one end of a single-beam section insulator. The other end of the insulator is rigidly attached to the crossing. The insulator end castings are shaped to prevent arcs from burning holes in the insulation between the bronze-casting clamps. Two crossing connections are made by the contact wires, and two by special adapters.

CROSSINGS WITH ONE LINE INSULATED

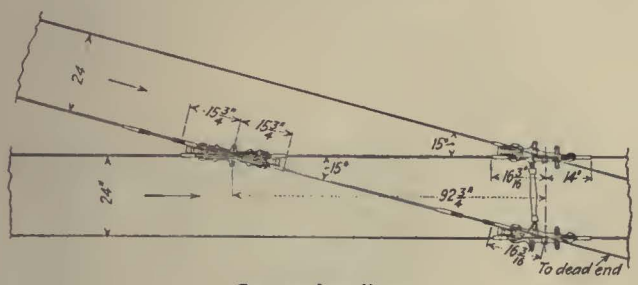
Where a trolley bus line crosses another against grade, one line should have power and the other should coast across. Two double-insulated crossings connected together by adapters make this possible without cutting the contact wires. The crossings are adjustable for angular movement.

CURRENT COLLECTORS

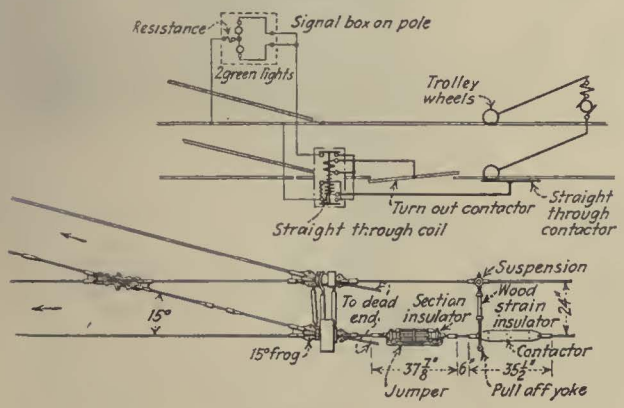
Trolley bus collectors require 18-ft. poles to permit side range and a polehead that will swivel sufficiently to maintain alignment of the collector contacts with the wires. Both pole and poleheads are heavier than those for electric cars, and require a base with a greater spring tension. The base has six springs instead of four as used on cars.



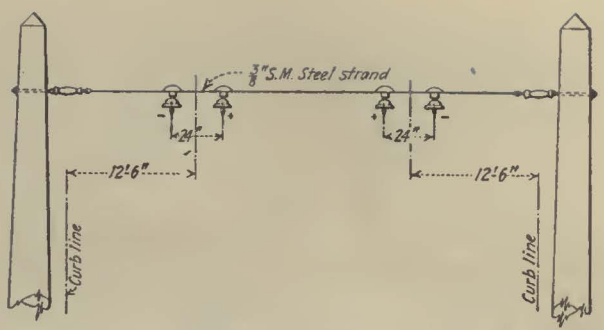
Electrically operated frog



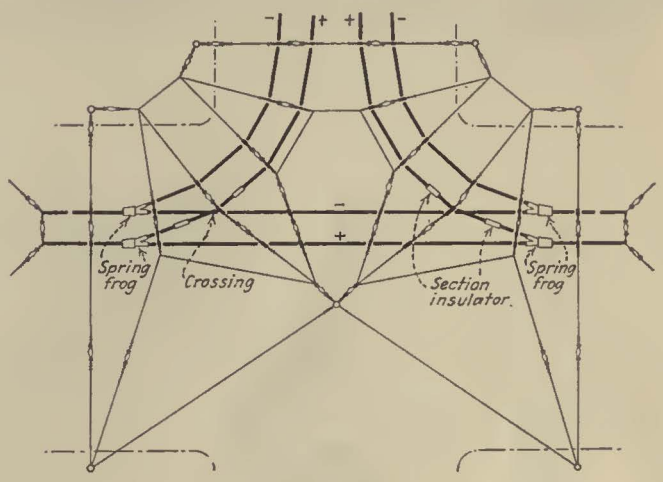
Converging lines



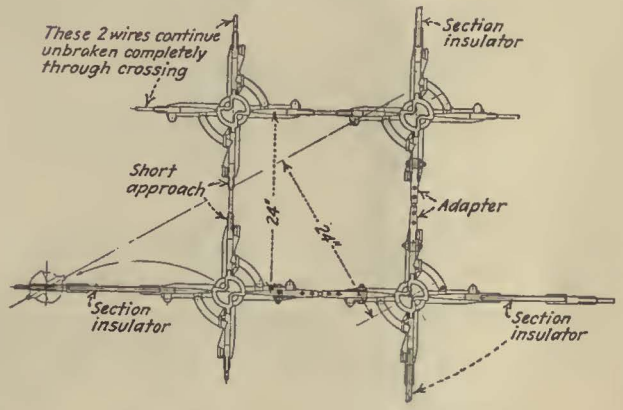
Diverging lines



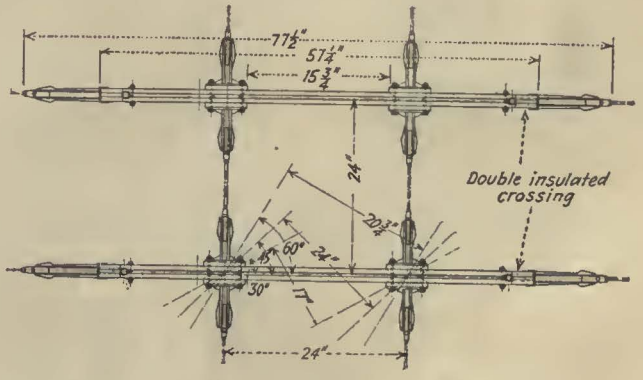
Tangent cross-span



Wye

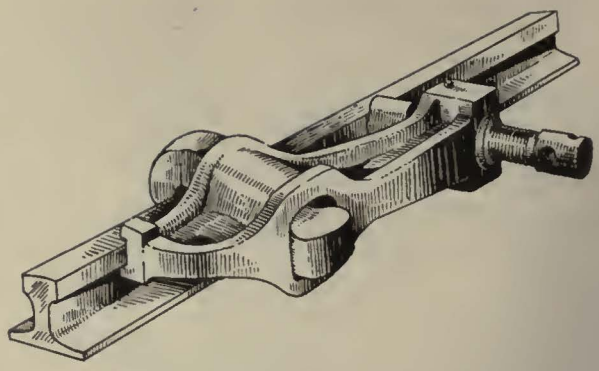


Crossing with both lines insulated

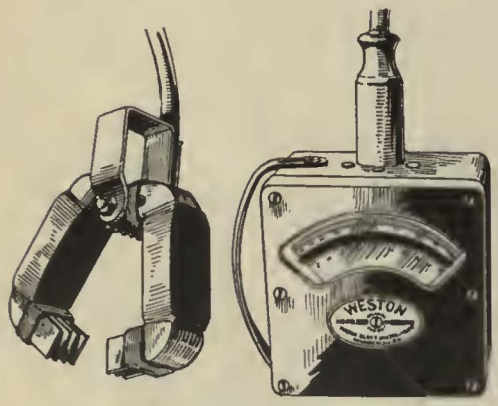


Crossing with one line insulated for 60 deg.-90 deg. angle

Bolt Tightener which has a special adjustable spring-tension over-running clutch to insure uniform tightness and tension on all rail clips. Only one man is needed to handle this device. *Manufacturer:* International Steel Tie Company, Cleveland, Ohio.



Reversible Rail Bender used for right-hand or left-hand by merely reversing the hook. It is not necessary to add angle bar and extra piece of rail. The bending screw is mounted in a trunnion bushing which swivels as the rail bends, exerting a pressure normal to the point of contact. *Manufacturer:* American Chain Company, Bridgeport, Connecticut.



Load Testing Set designed to measure current anywhere without interruption to service. The equipment consists of a split-core current transformer and a Weston ammeter, complete with connecting cable and plugging device. The transformer can be clamped over any type of conductor, bus bar, or terminal. The device has an accuracy of 1 per cent of full scale on the higher ranges. *Manufacturer:* Electrical Engineering Sales Company, Los Angeles, Cal.

This Feeder Wire Insulator has a 3½-in. petticoat of Dirigo insulating compound, extending below the metal parts. Into this Dirigo is molded a 1-in. pinhole to fit standard wood pins. The saddle on which the cable bears is curved to conform with the droop of the wire to avoid damage to heavy cables. The 1¼-in. seat accommodates standard 500,000-circ. mil weatherproof cable. *Manufacturer:* Ohio Brass Company, Mansfield, Ohio.

Adjustable Seat for Bus Operators

Heywood - Wakefield Company, Boston, Mass., is marketing a seat for bus operators that permits adjustment of height. This seat has a cushion that can be moved forward and backward, and the back can be inclined to the desired angle.

Cal-O-Rex

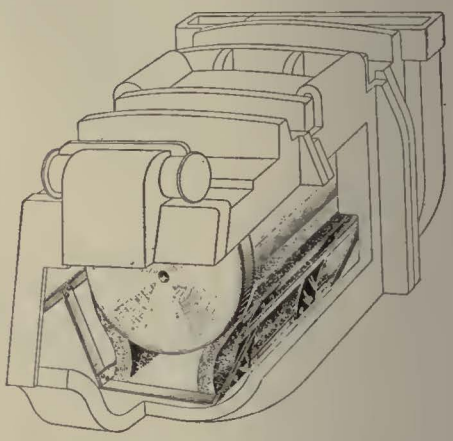
Liquid for the removal of rust and scale in hot-water heating systems is being sold by the Economy Electric Devices Company, Chicago, Ill., under the name of "Cal-O-Rex." It is mixed with the circulating water to dissolve the scale. Its freezing point is —35 deg. F. and the boiling point 230 deg. F.

Mastipave

Mastipave is a floor covering material for cars and buses being introduced by the Paraffine Companies, Inc. It is a fiberized mastic with a felt core and is laid in strips by cold-cementing to the floor surface. It is claimed to be waterproof and slip-proof, and easily cleaned by mopping with soap and water.

High Friction Brake Lining

Johns-Manville Corporation is producing a folded and compressed type of brake lining for heavy buses equipped with mechanical brakes. Modifications in the material itself and the methods of manufacture were made to produce frictional characteristics that would permit a uniform retardation rate with brakes designed for a high friction type of lining. Other advantages claimed are exceptionally long life and lack of any tendency to cut the brake drum.



Journal Box Lubricator which can be quickly installed and removed, and saves time in inspection by the elimination of waste packing. Running temperatures of the journal is said to be greatly decreased because of the larger radiating surface and more efficient lubrication. *Manufacturer:* C. B. Royal & Company, 426 South Clinton Street, Chicago, Ill.

This Headway Limit Signal informs the dispatcher when headway on a line exceeds a predetermined limit. It is used with an installation of overhead trolley contactors, the impulses from which are relayed over telephone wires to a central point. The above signal contains two rows of ten timers in each row controlled by one motor, and represents a control of ten lines, with one point on the inbound and another on the outbound track. *Manufacturer:* Nachod & United States Signal Company, Louisville, Ky.

Trend of REVENUES *and* EXPENSES

	Operating Revenue $	Increase or Decrease Per Cent*	Operating Expenses and Taxes $	Increase or Decrease Per Cent*	Net Income $*	Increase or Decrease Per Cent*
Boston Elevated Railway, Boston, Mass.						
Oct., 1930.....	2,811,399	*4.04*	2,157,474	*1.29*	221,188	*31.30*
Nov.....	2,579,899	*10.34*	2,066,206	*2.58*	71,150	*77.35*
Dec.....	2,850,330	*8.20*	2,178,896	*2.24*	235,950	*56.62*
Jan., 1931.....	2,840,159	*8.43*	2,082,456	*6.23*	314,067	*30.56*
Feb.....	2,534,828	*8.33*	1,952,032	*5.23*	142,339	*48.27*
Mar.....	2,769,564	*7.30*	2,019,081	*4.92*	309,212	*29.08*
Apr.....	2,616,188	*7.00*	1,909,176	*7.93*	275,740	*11.45*
May.....	2,579,265	*8.70*	1,993,753	*4.36*	143,804	*52.47*
June.....	2,415,179	*5.32*	2,073,560	7.04	*99,815*	*169.79*
July.....	2,188,942	*7.68*	2,021,305	*4.12*	*271,777*	*62.23*
Aug.....	2,098,072	*7.99*	1,948,492	*7.79*	*344,901*	*25.50*
Sept.....	2,243,491	*9.20*	1,931,683	*7.65*	*239,950*	*300.79*
Oct.....	2,502,848	*10.98*	1,926,536	*10.70*	30,145	*86.37*
Brooklyn-Manhattan Transit System, New York, N. Y.						
Oct., 1930.....	5,036,775	*2.58*	3,572,553	*4.22*	758,817	2.78
Nov.....	4,769,083	*4.37*	3,366,923	*6.98*	689,470	2.34
Dec.....	5,065,484	*2.56*	3,546,963	*4.25*	814,788	2.04
Jan., 1931.....	4,852,706	*5.48*	3,475,330	*7.01*	674,029	*5.80*
Feb.....	4,453,655	*3.79*	3,159,903	*5.96*	583,468	2.40
Mar.....	5,028,562	*2.56*	3,475,847	*3.37*	814,360	*4.13*
Apr.....	4,969,481	*2.09*	3,458,940	*3.35*	804,235	0.25
May.....	5,056,779	*3.31*	3,438,037	*4.51*	913,877	*1.84*
June.....	4,983,112	*1.71*	3,466,384	*3.49*	870,919	12.12
July.....	4,841,635	*3.24*	3,499,609	*3.02*	631,791	*7.21*
Aug.....	4,582,572	*3.27*	3,419,932	*3.90*	423,123	*9.03*
Sept.....	4,693,503	*2.91*	3,366,543	*2.51*	597,074	*15.27*
Oct.....	5,115,259	1.56	3,534,811	*1.05*	849,014	11.88
Brooklyn & Queens Transit System, New York, N. Y.						
Oct., 1930.....	1,922,388	*5.20*	1,597,166	*5.50*	214,924	*7.74*
Nov.....	1,820,498	*5.65*	1,522,735	*7.68*	187,822	5.20
Dec.....	1,920,463	*4.40*	1,560,950	*6.11*	250,893	6.06
Jan., 1931.....	1,849,644	*6.18*	1,541,235	*7.58*	197,355	3.02
Feb.....	1,704,677	*3.98*	1,416,192	*5.40*	176,217	2.58
Mar.....	1,941,078	*1.98*	1,602,862	*2.56*	227,472	1.21
Apr.....	1,911,878	*1.29*	1,592,919	*3.11*	208,514	6.86
May.....	1,980,118	*2.50*	1,585,293	*1.85*	286,334	*7.89*
June.....	1,942,830	*1.29*	1,609,335	0.34	221,493	*13.98*
July.....	1,893,414	*1.24*	1,550,897	*3.34*	227,012	11.59
Aug.....	1,849,792	1.23	1,574,167	*1.32*	142,067	17.54
Sept.....	1,930,047	2.25	1,583,777	1.25	219,515	2.70
Oct.....	2,094,410	8.94	1,702,496	6.59	263,043	22.38
Capital Traction Company, Washington, D. C.						
Oct., 1930.....	374,646	1.22	288,351	*1.48*	58,638	17.56
Nov.....	346,054	*2.70*	273,481	*1.54*	42,659	*11.05*
Dec.....	369,885	*1.77*	274,221	*3.21*	67,651	0.61
Jan., 1931.....	347,491	*3.06*	280,514	*3.30*	37,705	5.11
Feb.....	312,815	*3.47*	252,080	*5.68*	30,521	*1.87*
Mar.....	344,191	*2.65*	270,962	*3.86*	43,847	*4.03*
Apr.....	366,276	*2.39*	273,436	*5.89*	65,123	12.93
May.....	362,502	*1.87*	281,344	*1.61*	50,959	*5.60*
June.....	351,017	3.05	276,751	1.84	45,841	12.14
July.....	306,826	0.10	258,341	*1.52*	9,438	91.25
Aug.....	264,135	*16.02*	251,657	*6.29*	*17,408*	*208.00*
Sept.....	276,418	*15.65*	236,952	*11.61*	9,452	*63.76*
Oct.....	.....	.....	.....	.....	.....	.....
Chicago Surface Lines, Chicago, Ill.						
Oct., 1930.....	4,879,570	*10.79*	3,933,416	*7.35*	799,118	*11.69*
Nov.....	4,537,647	*13.48*	3,769,538	*6.86*	712,177	*20.77*
Dec.....	4,846,000	*8.09*	3,984,572	*9.69*	767,348	*15.67*
Jan., 1931.....	4,576,133	*12.65*	3,825,964	*5.37*	718,129	*21.00*
Feb.....	4,234,704	*10.90*	3,665,038	*6.04*	601,726	*15.44*
Mar.....	4,584,224	*4.35*	4,287,237	*5.34*	557,167	15.05
Apr.....	4,759,624	*4.46*	4,092,047	0.36	675,629	*11.66*
May.....	4,541,847	*9.38*	3,802,582	*4.61*	724,514	*12.88*
June.....	4,348,896	*8.76*	3,629,943	*5.36*	664,122	*14.51*
July.....	4,093,702	*9.74*	3,579,566	*5.98*	580,118	*10.55*
Aug.....	4,018,958	*10.45*	3,502,795	*7.74*	589,056	*10.34*
Sept.....	4,061,261	*11.14*	3,307,020	*12.73*	684,161	*4.88*
Oct.....	4,345,717	*10.94*	3,326,457	*15.43*	795,929	*3.99*
Department of Street Railways, Detroit, Mich.						
Oct., 1930.....	1,579,476	*25.84*	1,458,238	*14.91*	*22,933*	*91.71*
Nov.....	1,481,136	*23.35*	1,333,571	*13.38*	4,890	*98.14*
Dec.....	1,610,179	*22.59*	1,440,503	*21.67*	23,052	*77.93*
Jan., 1931.....	1,550,656	*28.54*	1,421,575	*20.95*	12,759	*91.44*
Feb.....	1,431,468	*25.58*	1,323,683	*18.96*	*28,309*	*117.91*
Mar.....	1,696,308	*16.58*	1,415,021	*18.68*	133,347	*11.03*
Apr.....	1,605,536	*19.51*	1,368,187	*20.82*	101,041	*27.10*
May.....	1,531,767	*22.42*	1,306,654	*18.75*	75,494	*69.04*
June.....	1,416,647	*20.71*	1,302,075	*13.86*	*34,977*	*121.99*
July.....	1,256,741	*18.39*	1,243,831	*14.38*	*144,112*	*244.41*
Aug.....	1,166,927	*23.04*	1,154,835	*19.06*	*144,883*	*174.54*
Sept.....	1,235,296	*18.21*	1,150,529	*19.89*	*69,382*	*34.17*
Oct.....	1,256,692	*20.44*	1,182,766	*18.90*	*81,501*	*255.35*
Eastern Massachusetts Street Railway, Boston, Mass.						
Oct., 1930.....	623,872	*8.48*	467,773	*4.92*	15,811	*76.73*
Nov.....	590,856	*10.90*	449,032	*1.60*	205	*97.62*
Dec.....	670,964	*11.93*	516,913	1.71	20,841	*84.02*
Jan., 1931.....	700,961	*7.63*	472,079	*2.88*	36,145	*56.16*
Feb.....	639,344	*6.62*	434,904	*2.83*	33,058	*50.88*
Mar.....	685,614	*3.63*	472,317	*1.53*	28,982	*81.33*
Apr.....	617,705	*5.21*	434,716	*2.59*	9,906	*78.95*
May.....	629,827	*5.14*	450,887	*0.23*	23,599	*52.14*
June.....	622,119	0.43	447,131	2.72	5,090	*82.24*
July.....	602,832	*2.33*	459,166	*0.41*	*24,412*	*721.80*
Aug.....	608,034	*2.61*	450,584	1.38	*10,712*	*137.72*
Sept.....	581,396	*5.03*	447,346	*0.25*	*27,716*	*227.66*
Oct.....	567,032	*9.27*	443,093	*5.28*	*33,146*	*309.64*

	Operating Revenue $	Increase or Decrease Per Cent*	Operating Expenses and Taxes $	Increase or Decrease Per Cent*	Net Income $*	Increase or Decrease Per Cent*
Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y.						
Oct., 1930.....	75,708	*17.80*	66,353	*0.69*	*18,447*	*226.80*
Nov.....	72,024	*13.82*	66,314	*0.93*	*21,171*	*152.25*
Dec.....	.....	.....	.....	.....	.....	.....
Jan., 1931.....	79,764	*15.78*	67,438	*7.38*	*13,133*	*236.77*
Feb.....	74,018	*13.38*	62,239	*7.93*	*13,594*	*75.36*
Mar.....	75,201	*7.83*	64,051	*7.61*	*13,965*	*5.23*
Apr.....	70,660	*0.48*	62,685	*4.90*	*16,298*	23.64
May.....	72,560	*8.29*	61,048	*8.32*	*15,996*	*21.34*
June.....	63,338	*13.81*	59,346	*9.15*	*24,700*	*97.48*
July.....	58,406	*4.11*	59,429	*7.33*	*20,259*	16.34
Aug.....	61,749	*4.40*	57,896	*7.34*	*7,823*	46.23
Sept.....	60,302	*16.55*	58,616	*7.76*	*23,041*	*171.16*
Oct.....	.....	.....	.....	.....	.....	.....
Galveston-Houston Electric Railway, Houston, Tex.					†	†
Oct., 1930.....	38,032	*11.56*	27,266	*8.85*	.....	.....
Nov.....	36,974	*12.49*	44,183	*9.58*	*93,685*	*127.12*
Dec.....	36,166	*15.00*	27,949	*1.79*	*99,343*	*112.93*
Jan., 1931.....	33,291	*20.15*	25,057	*9.18*	*105,000*	*110.59*
Feb.....	32,281	*19.80*	22,990	*9.84*	*111,369*	*110.17*
Mar.....	32,904	*22.38*	24,732	*14.59*	*114,459*	*93.49*
Apr.....	34,729	*15.98*	24,132	*11.98*	*117,394*	*189.69*
May.....	.....	.....	.....	.....	.....	.....
June.....	39,889	*12.63*	24,992	*11.61*	*116,770*	*57.67*
July.....	41,484	*11.27*	25,961	*11.24*	*116,819*	*49.64*
Aug.....	.....	.....	.....	.....	.....	.....
Sept.....	.....	.....	.....	.....	.....	.....
Oct.....	.....	.....	.....	.....	.....	.....
Houston Electric Company, Houston, Tex.					†	†
Oct., 1930.....	267,306	*7.57*	181,499	*10.67*	573,425	*4.18*
Nov.....	247,210	*10.00*	176,739	*1.98*	550,635	*9.55*
Dec.....	258,219	*9.84*	180,678	*0.62*	524,458	*18.84*
Jan., 1931.....	242,554	*10.52*	176,792	*11.08*	518,843	*17.70*
Feb.....	223,256	*14.11*	163,249	*12.96*	507,328	*20.19*
Mar.....	244,396	*10.97*	170,067	*12.70*	502,405	*19.39*
Apr.....	.....	.....	.....	.....	.....	.....
May.....	.....	.....	.....	.....	.....	.....
June.....	222,528	*10.09*	159,897	*10.71*	507,530	*13.86*
July.....	214,241	*13.29*	158,175	*10.50*	404,721	*30.73*
Aug.....	.....	.....	.....	.....	.....	.....
Sept.....	.....	.....	.....	.....	.....	.....
Oct.....	.....	.....	.....	.....	.....	.....
Hudson & Manhattan Railroad, New York, N. Y.						
Oct., 1930.....	1,033,584	*4.33*	521,325	*1.97*	176,999	*17.79*
Nov.....	994,735	*6.18*	489,761	*4.08*	169,465	*21.42*
Dec.....	1,060,614	*4.66*	419,109	*17.40*	306,321	12.49
Jan., 1931.....	1,005,022	*7.62*	512,350	*7.23*	157,098	*21.78*
Feb.....	936,542	*5.67*	467,137	*8.09*	134,717	*16.34*
Mar.....	1,013,577	*6.05*	497,695	*6.34*	180,554	*15.13*
Apr.....	1,002,265	*5.78*	485,938	*5.73*	181,182	*16.09*
May.....	974,737	*6.24*	481,504	*5.53*	158,191	*18.77*
June.....	941,598	*4.82*	477,392	*4.41*	128,896	*16.83*
July.....	897,211	*6.00*	470,918	*6.28*	91,288	*21.80*
Aug.....	875,376	*6.29*	463,292	*7.31*	77,020	*22.18*
Sept.....	897,981	*7.73*	454,556	*10.32*	108,624	*17.91*
Oct.....	959,096	*7.21*	473,902	*9.09*	150,241	*14.92*
Illinois Terminal Company, Springfield, Ill.						
Oct., 1930.....	691,672	*2.54*	506,107	*2.41*	148,701	11.61
Nov.....	542,672	*11.02*	430,907	*6.24*	80,529	*23.11*
Dec.....	577,425	*13.69*	421,987	*14.26*	127,588	5.66
Jan., 1931.....	509,641	*20.77*	395,953	*19.80*	87,742	*9.83*
Feb.....	498,067	*5.89*	388,126	*3.81*	84,381	2.26
Mar.....	568,653	*1.95*	398,855	*5.94*	143,325	28.98
Apr.....	547,992	*7.17*	395,315	*6.46*	127,179	*3.24*
May.....	581,953	*4.34*	389,538	*8.87*	162,905	13.83
June.....	581,093	*1.58*	398,980	*15.29*	154,417	90.05
July.....	550,906	*8.41*	395,741	*16.33*	123,420	40.89
Aug.....	597,050	*9.75*	403,603	*13.54*	156,770	2.58
Sept.....	535,497	*18.18*	386,035	*15.12*	116,501	*27.59*
Oct.....	.....	.....	.....	.....	.....	.....
Interborough Rapid Transit Company, New York, N. Y.						
Oct., 1930.....	6,315,679	*1.13*	4,162,660	*0.83*	*161,417*	*7.14*
Nov.....	5,965,365	*4.96*	3,869,340	0.00	*272,021*	*121.79*
Dec.....	6,477,864	*0.52*	4,194,315	3.96	*293,152*	*47.40*
Jan., 1931.....	6,123,645	*4.42*	4,538,833	10.83	*348,972*	*65.92*
Feb.....	5,570,354	*3.27*	3,653,798	*2.10*	*321,587*	*10.36*
Mar.....	6,293,013	*2.24*	3,973,704	*4.61*	*212,644*	*6.65*
Apr.....	6,127,713	*2.38*	3,993,181	*2.83*	*189,134*	*17.33*
May.....	6,006,273	*4.47*	3,932,452	*3.98*	*207,096*	*36.12*
June.....	5,722,428	*1.38*	3,926,068	*2.52*	*216,406*	1.00
July.....	5,140,337	*4.36*	3,864,469	*5.25*	*541,400*	*2.00*
Aug.....	4,916,794	*7.07*	3,720,781	*7.28*	*621,219*	18.63
Sept.....	5,282,203	*6.95*	3,757,449	*5.67*	*285,288*	*117.32*
Oct.....	5,960,333	*5.63*	3,816,464	*8.32*	*331,978*	*105.66*
Jacksonville Traction Company, Jacksonville, Fla.					†	†
Oct., 1930.....	84,424	*12.50*	76,374	*13.72*	*65,525*	*2.13*
Nov.....	81,250	*12.24*	69,437	*16.02*	*62,599*	0.15
Dec.....	89,903	*11.47*	74,836	*11.49*	*63,204*	*4.62*
Jan., 1931.....	87,160	*8.08*	77,998	*13.67*	*58,133*	11.98
Feb.....	76,205	*15.60*	75,462	*28.14*	*77,874*	*23.42*
Mar.....	84,018	*12.36*	77,758	*4.09*	*87,042*	*31.90*
Apr.....	81,695	*11.48*	74,847	*6.57*	*92,573*	*142.13*
May.....	80,798	*9.96*	76,856	*4.57*	*97,550*	*46.33*
June.....	73,708	*6.80*	73,904	*5.68*	*100,491*	*47.45*
July.....	70,046	*11.08*	73,815	*5.10*	*106,454*	*50.06*
Aug.....	66,836	*13.69*	71,639	*8.36*	*111,654*	*63.78*
Sept.....	.....	.....	.....	.....	.....	.....
Oct.....	.....	.....	.....	.....	.....	.....

*Decreases or deficits are shown by *italic figures.*

†Net income is shown for the preceding twelve months.

Trend of Revenues and Expenses by Months *(Concluded)*

	Operating Revenue $	Increase or Decrease Per Cent*	Operating Expenses and Taxes $	Increase or Decrease Per Cent*	Net Income $*	Increase or Decrease Per Cent*
Kansas City Public Service Company, Kansas City, Mo.					†	†
Oct., 1930.....	724,125	*4.89*	570,892	*7.93*	68,983	3.13
Nov.....	706,577	*5.29*	572,066	*7.04*	58,994	*5.69*
Dec.....	758,045	*1.73*	570,065	*14.58*	108,444	*284.88*
Jan., 1931.....	711,215	*6.52*	577,741	*12.67*	61,108	137.10
Feb.....	640,676	*6.87*	537,583	*9.72*	27,392	149.06
Mar.....	216,637	*2.58*	577,319	*7.25*	66,013	72.81
Apr.....	709,515	*0.68*	565,328	*6.23*	71,298	99.32
May.....	701,286	*2.37*	562,482	*7.66*	64,474	114.33
June.....	655,957	0.17	540,187	*6.23*	42,677	683.20
July.....	613,628	*3.19*	533,084	*9.23*	6,643	119.18
Aug.....	600,311	*6.57*	518,559	*2.18*	6,122	247.05
Sept.....	603,215	*7.21*	523,601	*0.14*	6,503	*87.06*
Oct.....	634,307	*12.40*	537,940	*5.77*	22,378	*67.56*
Long Island Railroad, New York, N. Y.						
Oct., 1930.....	3,371,761	*5.80*	2,446,346	*8.97*	729,067	1.77
Nov.....	2,954,624	*4.20*	2,249,258	*14.66*	483,180	89.15
Dec.....	2,905,045	*6.60*	2,130,182	*16.27*	596,812	47.11
Jan., 1931.....	2,763,421	*6.65*	2,210,263	*9.65*	321,141	*6.00*
Feb.....	2,561,169	*7.43*	2,074,216	*9.13*	332,002	*3.86*
Mar.....	2,841,915	*3.09*	2,234,418	*9.00*	449,501	24.64
Apr.....	2,976,402	*4.69*	2,269,029	*7.37*	533,425	1.97
May.....	3,212,765	*4.00*	2,338,313	*8.03*	695,032	9.93
June.....	3,414,354	*6.78*	2,351,016	*7.26*	907,010	*5.76*
July.....	3,629,561	*9.69*	2,594,463	*2.75*	783,315	*32.75*
Aug.....	3,513,473	*11.48*	2,504,287	*5.04*	781,691	*32.08*
Sept.....	3,167,769	*11.75*	2,346,113	*5.94*	592,638	*34.26*
Oct.....	.....	.....	.....	.....	.....	.....
Market Street Railway, San Francisco, Cal.						
Oct., 1930.....	786,012	*6.73*	675,908	*6.49*	57,384	*45.58*
Nov.....	729,407	*8.81*	615,613	*6.18*	60,457	*29.25*
Dec.....	775,508	*5.12*	639,249	*5.52*	83,460	*0.03*
Jan., 1931.....	738,092	*6.55*	641,519	*4.83*	45,011	*12.31*
Feb.....	668,931	*8.17*	576,661	*8.22*	41,002	7.29
Mar.....	757,960	*6.40*	633,346	*6.81*	72,828	*0.05*
Apr.....	745,252	*6.72*	620,106	*7.06*	73,837	*3.46*
May.....	733,105	*7.50*	619,934	*8.21*	62,805	2.08
June.....	704,769	*5.19*	654,225	1.75	37,384	*11.62*
July.....	700,996	*4.68*	598,082	*7.97*	52,186	60.40
Aug.....	726,480	*5.69*	607,925	*5.50*	68,175	*6.51*
Sept.....	700,563	*6.00*	581,479	*7.23*	68,712	6.15
Oct.....	725,458	*7.70*	614,327	*9.38*	61,010	6.32
New York & Queens County Railway, New York, N. Y.						
Oct., 1930.....	$77,037	*2.79*	$74,388	*0.95*	$2,117	*51.69*
Nov.....	71,339	*4.29*	64,840	*12.17*	6,348	553.52
Dec.....	76,330	*3.21*	75,421	2.76	839	*85.64*
Jan., 1931.....	75,130	*5.09*	76,716	7.78	*1,743*	*120.85*
Feb.....	67,321	*5.47*	63,363	*5.44*	3,694	*18.97*
Mar.....	74,890	*3.41*	72,370	*6.16*	365	*56.60*
Apr.....	74,339	*3.95*	73,379	*2.15*	*767*	*126.84*
May.....	80,601	*2.07*	72,852	*3.59*	6,081	*11.12*
June.....	75,874	*0.08*	69,642	0.17	4,267	*33.70*
July.....	72,364	*0.19*	61,934	*8.15*	9,301	124.07
Aug.....	65,455	*6.87*	61,722	*11.32*	2,452	1,111.93
Sept.....	63,953	*15.74*	57,815	*17.08*	4,703	*14.77*
Oct.....	67,055	*12.95*	57,314	*22.95*	8,372	295.46
New York, Westchester & Boston Railway, New York, N. Y.						
Oct., 1930.....	202,046	*7.52*	138,192	*14.09*	*190,748*	*20.81*
Nov.....	184,690	*8.74*	170,542	2.52	*216,451*	*19.76*
Dec.....	190,136	*12.31*	138,592	*17.80*	*205,029*	16.75
Jan., 1931.....	182,249	*13.76*	160,800	9.44	*220,394*	*32.37*
Feb.....	161,311	*15.02*	149,571	*11.18*	*222,308*	*29.42*
Mar.....	181,729	*12.80*	144,442	3.54	*195,802*	*24.31*
Apr.....	186,708	*13.03*	142,832	0.31	*189,142*	*19.00*
May.....	195,905	*15.11*	149,268	*0.42*	*186,389*	*25.70*
June.....	193,820	*14.62*	142,600	*3.45*	*183,007*	*23.70*
July.....	195,461	*12.92*	146,820	*0.40*	*188,581*	*23.55*
Aug.....	180,965	*8.79*	142,111	*6.62*	*197,099*	*6.55*
Sept.....	181,828	*10.70*	137,940	*16.53*	*191,542*	0.68
Oct.....	184,144	*5.86*	142,401	*3.04*	194,351	*1.89*
Northwestern Pacific Railroad, Sausalito, Cal.						
Oct., 1930.....	555,867	*18.49*	534,858	4.44	7,447	*95.22*
Nov.....	333,193	*27.74*	421,717	*16.33*	97,567	*120.85*
Dec.....	312,319	*20.77*	465,220	*3.46*	158,491	*74.63*
Jan., 1931.....	283,852	*21.78*	401,656	*14.41*	123,928	*14.76*
Feb.....	273,818	*27.40*	387,512	*12.96*	*122,531*	*68.87*
Mar.....	308,466	*24.17*	408,068	*14.43*	*109,855*	*48.81*
Apr.....	322,742	*25.66*	402,400	*16.55*	*88,300*	*58.51*
May.....	346,743	*28.51*	362,722	*24.85*	*28,886*	*931.64*
June.....	380,604	*24.50*	368,559	*17.82*	1,970	*95.39*
July.....	479,098	*19.97*	354,413	*9.69*	110,013	*43.64*
Aug.....	464,342	*27.27*	368,885	*11.22*	82,947	*65.23*
Sept.....	422,276	*22.98*	348,672	*26.07*	60,430	*1.69*
Oct.....	422,276	*22.98*	348,672	*26.07*	60,430	*1.69*
Staten Island Rapid Transit Company, New York, N. Y.						
Oct., 1930.....	205,631	*10.58*	167,586	*6.49*	29,723	*26.11*
Nov.....	178,652	*17.42*	161,608	*0.58*	10,788	*80.37*
Dec.....	178,474	*9.08*	160,715	47.29	5,997	*92.23*
Jan., 1931.....	170,387	*9.58*	158,982	*6.35*	*1,448*	*114.6*
Feb.....	161,415	*13.58*	142,565	*9.20*	2,151	*93.49*
Mar.....	173,723	*7.98*	159,035	*7.78*	*1,164*	*81.24*
Apr.....	176,863	*10.76*	147,210	*13.23*	23,169	*31.91*
May.....	188,151	*11.61*	163,148	*7.61*	9,268	*63.19*
June.....	204,452	*9.12*	150,345	*16.01*	39,203	0.38
July.....	202,230	*17.11*	163,479	*13.58*	25,402	*38.08*
Aug.....	197,386	*15.42*	159,702	*5.00*	23,973	*51.56*
Sept.....	184,276	*10.93*	149,255	*9.35*	21,907	*16.15*
Oct.....	184,276	*10.93*	149,255	*9.35*	21,907	*16.15*
Third Avenue Railway System, New York, N. Y.						
Oct., 1930.....	1,456,688	*4.03*	1,205,455	9.73	36,257	317.06
Nov.....	1,373,335	*5.37*	1,146,168	*10.17*	12,079	130.15
Dec.....	1,438,752	*3.49*	1,197,249	*8.51*	26,250	186.44
Jan., 1931.....	1,393,054	*5.10*	1,178,797	*9.14*	*1,594*	96.33
Feb.....	1,274,832	*4.27*	1,070,307	*8.56*	*11,143*	*126.49*
Mar.....	1,418,429	*3.38*	1,174,984	*6.86*	27,364	430.88
Apr.....	1,408,235	*3.25*	1,155,880	*5.98*	44,331	250.25
May.....	1,464,031	*4.29*	1,072,584	*7.70*	76,972	32.40
June.....	1,440,848	*2.88*	1,145,871	*6.19*	79,746	76.91
July.....	1,394,973	*2.43*	1,140,036	*5.96*	41,829	1,924.08
Aug.....	1,302,353	*3.53*	1,087,507	*7.90*	1,067	129.27
Sept.....	1,328,192	*7.00*	1,070,866	*8.28*	46,099	1.01
Oct.....	1,429,787	*1.85*	1,134,793	*5.87*	77,559	113.91
United Electric Railways, Providence, R. I.						
Oct., 1930.....	531,803	*13.76*	439,896	.....	41,223	*53.80*
Nov.....	506,318	*14.58*	439,930	*12.83*	16,958	*54.37*
Dec.....	559,363	*13.02*	460,420	*21.92*	51,623	889.51
Jan., 1931.....	543,940	*13.39*	493,596	*12.94*	372	*95.68*
Feb.....	482,566	*14.30*	437,444	*13.02*	*4,503*	*150.71*
Mar.....	524,299	*10.44*	480,958	*9.38*	*6,253*	*265.73*
Apr.....	510,645	*9.39*	470,964	*7.60*	*9,992*	*455.60*
May.....	509,278	*10.64*	474,803	*7.52*	*15,021*	*168.13*
June.....	482,703	*9.40*	438,362	*8.15*	*4,633*	*201.09*
July.....	462,601	*10.24*	436,574	*4.84*	*22,069*	*502.72*
Aug.....	445,932	*10.15*	420,929	*4.78*	*23,467*	*744.17*
Sept.....	455,562	*7.65*	413,926	*4.63*	*6,184*	*173.83*
Oct.....	486,528	*8.61*	423,433	*3.74*	15,797	*61.68*
United Railways & Electric Company, Baltimore, Md.						
Oct., 1930.....	1,354,086	*7.28*	1,049,306	*4.84*	25,163	*71.16*
Nov.....	1,263,811	*10.26*	983,047	*7.40*	9,200	*87.30*
Dec.....	1,350,553	*8.19*	1,043,315	*7.25*	36,700	*54.54*
Jan., 1931.....	1,268,536	*10.90*	994,411	*11.89*	7,388	*69.22*
Feb.....	1,136,604	*15.78*	891,421	*16.97*	*24,088*	*31.15*
Mar.....	1,262,429	*14.90*	981,026	*14.76*	12,212	*84.94*
Apr.....	1,253,764	*13.50*	966,424	*13.56*	11,440	*82.93*
May.....	1,256,334	*13.78*	991,107	*11.93*	2,206	*96.99*
June.....	1,195,126	*10.29*	963,857	*7.59*	*34,952*	*198.96*
July.....	1,105,980	*10.55*	946,646	*1.86*	*117,591*	*918.99*
Aug.....	1,038,314	*13.34*	947,614	1.76	*180,963*	*3,057.40*
Sept.....	1,084,246	*14.07*	.....	.....	*133,449*	*1,427.85*
Sept.....	1,084,246	*14.07*	946,909	*4.91*	*133,449*	*1,427.85*
Oct.....	1,175,854	*13.16*	.....	.....	*110,345*	*538.52*

*Decreases or deficits are shown by *italic figures*.
Net income is shown for the preceding twelve months

Monthly and Other Financial Reports

	Operating Revenue $	Operating Expenses $	Taxes $	Gross Income $	Net Income $
Boston, Revere Beach & Lynn R.R., Boston, Mass.					
3 mo. end. Sept., 1931.	.....	.....	.....	65,767	30,573
3 mo. end. Sept., 1930.	.....	.....	.....	87,542	51,873
9 mo. end. Sept., 1931.	.....	.....	.....	123,457	17,903
9 mo. end. Sept., 1930.	.....	.....	.....	173,634	66,323
Boston, Worcester & New York Street Railway, Framingham, Mass.					
3 mo. end. Sept., 1931.	.....	.....	.....	43,551	34,067
3 mo. end. Sept., 1930.	.....	.....	.....	23,985	10,125
9 mo. end. Sept., 1931.	.....	.....	.....	58,654	23,643
9 mo. end. Sept., 1930.	.....	.....	.....	44,344	2,764
Calgary Municipal Railway, Calgary, Alta.					
9 mo. end. Sept., 1931.	585,506	417,884	.....	167,622	*67,325*
9 mo. end. Sept., 1930.	.....	.....	.....	.....	18,001
Denver Tramway, Denver, Col.					
9 mo. end. Sept., 1931.	2,658,904	1,897,966	331,921	464,305	104,146
9 mo. end. Sept., 1930.	2,987,628	2,062,237	365,164	594,594	220,145
Edmonton Radial Railway, Edmonton, Alta.					
September, 1931.....	53,163	38,960	.....	14,203	*3,877*
September, 1930.....	58,197	41,378	.....	16,819	*1,907*
9 mo. end. Sept., 1931.	539,233	394,563	.....	144,669	*36,800*
9 mo. end. Sept., 1930.	604,032	408,669	.....	195,362	*6,842*
Havana Electric Railway, Havana, Cuba					
3 mo. end. Sept., 1931.	458,418	542,867*a*	.....	*83,779*	*240,451b*
3 mo. end. Sept., 1930.	1,324,517	1,111,696*a*	.....	216,603	59,445*b*
9 mo. end. Sept., 1931.	2,546,705	2,411,413*a*	.....	138,478	*331,512b*
9 mo. end. Sept., 1930.	4,011,646	3,356,172*a*	.....	670,396	195,361*b*
International Railway, Buffalo, N. Y.					
9 mo. end. Sept., 1931.	6,281,449	5,294,906	.....	1,012,457	85,947
9 mo. end. Sept., 1930.	7,489,380	6,376,201	.....	1,190,577	244,016
Mexico Tramways Co., Mexico City, Mex. (In pesos)					
September, 1931.....	760,380	845,400	.....	*85,020*	.....
September, 1930.....	817,520	918,940	.....	*101,420*	.....
9 mo. end. Sept., 1931.	6,966,810	6,237,820	.....	728,990	.....
9 mo. end. Sept., 1930.	7,541,310	6,949,470	.....	591,840	.....
New York State Railways, Rochester, N. Y.					
9 mo. end. Sept., 1931.	1,330,010	1,464,854*a*	.....	*113,859*	*478,890*
9 mo. end. Sept., 1930.	1,642,003	1,965,745*a*	.....	*291,758*	*660,722*
Saskatoon Municipal Railway, Saskatoon, Sask.					
8 mo. end. Aug., 1931..	190,525	153,299	7,408	.....	*51,764*
8 mo. end. Aug., 1930..	.....	.....	.....	.....	*27,460*
Springfield Street Railway, Springfield, Mass.					
3 mo. end. Sept., 1931.	.....	.....	.....	61,876	*6,925*
3 mo. end. Sept., 1930.	.....	.....	.....	68,488	*1,191*
9 mo. end. Sept., 1931.	.....	.....	.....	293,308	86,263
9 mo. end. Sept., 1930.	.....	.....	.....	348,602	137,786

Italic figures indicate deficits. *a* Includes taxes. *b* Before depreciation.

NEWS *of the Industry*

Improvement Projects

Birmingham, Ala.—The Birmingham Electric Company will rush the laying of its new double tracks through the Twentieth Street underpass, one of a series of underpasses now nearing completion. The laying of this trackage will place the north and south cars back on their original routes. The rerouting involved during the progress of the work has slowed up service.

✦

Seattle, Wash. — Municipal Street Railway track construction necessary early next year as part of the University Bridge improvement program will cost $26,000. This will be in addition to the $675,000 in general obligation bonds which the people voted a year ago last March for replacement of the present wooden approaches with wider structures of steel and concrete.

✦

Lynchburg, Va. — City Manager R. W. B. Hart, J. H. Pritchard, general manager, and C. B. Fockler, engineer in charge of construction of Lynchburg Traction & Light Company, have conferred about the improvement of Rivermont Avenue between Belmont and Belvedere Streets. For this purpose, the Council has set aside $100,000. A proposal has been advanced to set back the curb lines 18 in. on each side of the street in order to provide room for an automobile to pass between a street car and a vehicle parked at the curb. It is proposed also to pave the 2-mile stretch with concrete. This would necessitate the raising of the street car rails 3 in., thus permitting the city to put down a concrete surface over the present base.

✦

New York, N. Y. — The Board of Transportation will receive bids on Dec. 11 for station and tunnel lighting in the Queens link from Manhattan to 36th Street and Queens Boulevard and also the Brooklyn crosstown line of the new city subway from Court Square, Long Island City to Nassau Avenue, Brooklyn.

✦

San Francisco, Cal. — Work has started on the construction of the new Balboa Street extension of the Market Street Railway, to which reference was made in ELECTRIC RAILWAY JOURNAL for Nov. 14. The work will consist of 2.85 miles of double track between Turk and Divisadero Streets on the east and Balboa Street and 31st Avenue on the west. The first step is the preparation by the regular overhead line crews of the company of pole and transmission line work. It is estimated that the entire job will cost $400,000. It is planned to begin work at Sixth Avenue and Balboa Street and work westward, timing the job so that the company will be ready to do the final piece of track on the east end by the time the city has finished regrading Turk Street west of Divisadero Street.

Plans for New Year Made by A. E. R. A. Executive Body

Plans for activities during the coming year were discussed at the first meeting of the new Executive Committee of the American Electric Railway Association held at association headquarters, New York City, on Nov. 20. President Richardson announced the reappointment of C. D. Cass as general counsel of the association. The names of the members of the advisory council to serve during the coming year were also announced.

Before proceeding with its regular business, the committee listened to a short talk by Malcolm Muir, president of the McGraw-Hill Publishing Company, Inc., concerning the plan to change the name of ELECTRIC RAILWAY JOURNAL at the beginning of next year. Mr. Muir pointed out that both the industry and the paper have greatly broadened the scope of their activities in recent years and have outgrown a designation that appears to embrace only one particular form of transportation. He said that no other word so well describes the tremendously important business of furnishing transportation in our cities and adjacent areas as does the word "transit." Electric street railways, subways, elevated railways, buses, trolley buses, taxicabs, interurban electric lines and electrified suburban railroad lines, are all included within its scope.

Following Mr. Muir's talk, there was general discussion as to whether or not it would be desirable to embody the word "community" in the new name, but the consensus of opinion was that the two-word name TRANSIT JOURNAL would be best. While no official action was taken by the committee, it was evident that the general sentiment approved the proposed change.

In connection with the report of the Manufacturers' Advisory Committee, which

(Continued on Page 715)

The Business Outlook

SOME slackening of the rate of bank credit contraction, slowing up of currency expansion and bank suspensions, strengthening of the dollar and mark exchanges, accelerated action on German reparations and debt problems by the creditor powers hold out promise that the period of acute financial disturbance which has complicated the depression may be definitely past by spring. Security markets are standing well the postponement of railroad wage adjustments, the pressure of tax selling and poor corporation earnings results and the commodity markets continue steady despite the dampening of their earlier inflationary enthusiasm. In short, with steel and motors apparently most hopeful of keeping some of the home fires burning in anticipation of spring improvement, business would seem to be prepared to dig in for the winter and watch the coming congressional carnival of political winter-sports in Washington.—*The Business Week.*

Evansville Company Starts Another Bus Service

The Evansville, Suburban & Newburgh Railway has started bus service between Evansville and Petersburg, Ind., by way of Boonville. For more than a year the company has maintained bus service between Evansville and Boonville, replacing rail service. Three trips daily are being made now by the buses between Evansville and Petersburg. The new service covers 36 miles and taps the rich coal field of Pike County and northern Warrick County. The railway will also start a daily freight service between Evansville and Petersburg. President Muhlhausen feels that the new service will be profitable. The company also operates buses between Evansville and Newburgh. Some time ago the Public Service Commission approved the plan for the new Evansville-Petersburg route, but operation over it has been held up until the present time pending repair of a bridge 3 miles south of Arthur. The route is over Road No. 62 to Boonville, and over Road No. 61 from Boonville to Petersburg. Part of the route is concrete pavement, and the rest of it has been improved with dustless top.

Tow-in Law Under Fire in Indianapolis

Several groups of Indianapolis citizens are waging bitter warfare against enforcement of the city's recently enacted tow-in law which permits the police to impound autos parked improperly on the city streets. Although city officials have shown a willingness to meet with committees representing citizens and discuss measures alternative to the tow-in, Mayor Sullivan is on record as irrevocably opposed to a return to the old sticker system. The Mayor recently was quoted as saying that newspapers and business men who most actively oppose the tow-in ordinance are the ones who most frequently "fixed" stickers in former days. It is his opinion that the city will benefit materially under a parking code with an enforcement rule that possesses teeth.

Fare Changes

Youngstown, Ohio—Weekly sales of car and bus passes under the $1 rate continued to increase, according to Youngstown Municipal Railway officials. The sales for the week recently ended were 7,400, compared to 7,362 the previous week and 7,013, the first week of the reduced rate. The three-month trial of the $1 rate still has two months to go.

✦

Newark, N. J.—The Lackawanna Railroad has made a further reduction in round-trip tickets to Newark and New York within the new suburban electric zone, effective Dec. 1. The new price is equal to the approximate cost of a one-way ticket. Tickets will not be honored on morning and evening rush-hour trains. They will be on sale daily from Dec. 1 to Dec. 24. Tickets will not be sold at reduced rates in the opposite direction. The reduced fares are experimental. New prices are $1.45 to New York and $1.20 to Newark from Dover, and $1.35 to New York and $1.10 to Newark from Rockaway.

✦

Toledo, Ohio.—The Street Railway Board of Control has approved plans of the Community Traction Company to issue shoppers' passes to be sold for a week's riding at 75 cents. The passes probably will be issued the last week in November, but no definite time has been set by the company. The shoppers' pass will be honored on all cars and buses between 9 a. m. and 4 p. m. and from 6:30 p. m. to 3 a. m.

Bus Operations

Tuckahoe, N. Y.—The East Chester Town Board has suggested that the Third Avenue Railway System substitute buses for trolleys on the Waverly Square-Mount Vernon route. The company plans to run buses from White Plains to Mount Vernon, and will exextend the New Rochelle-Tuckahoe route, which now terminates at Mill Road and White Plains Post Road, East Chester, to the railroad station in Tuckahoe.

✦

Savannah, Ga.—The Savannah Electric & Power Company would substitute service by bus for its present Battery Park car service operating regular city type buses over the new route, furnishing substantially the same frequency of service. This proposed service would transverse three present car lines, enabling passengers to transfer to and from any one of these lines. It would make a shorter and more direct route for passengers from the southern and eastern sections of the city wishing to visit Laurel Grove Cemetery and the southwestern section of the city. The fare would be the standard car fare with the usual free transfer privilege between car and bus service.

✦

Cleveland, Ohio—Pointing to the report of Street Railway Commissioner C. M. Ballou which showed a loss of $252,780 on bus operation during the first six months of 1931, City Councilman Kohen, suggests that the Cleveland Railway discontinue five bus lines and shorten four others in an effort to reduce the deficit. Legislation to this end has been prepared, but it is expected the movement will result in much opposition from business men and residents in the territory served.

✦

Warren, Ohio—If the P. & O. Coach Lines give Warren half-hour bus service at the same fare as now charged for street car transportation, the city will not protest the withdrawal of local railway service. It is said the city will insist that the company make some arrangement to remove the trolley tracks or resurface over them.

✦

Roanoke, Va.—The State Corporation Commission has authorized the Roanoke Railway & Electric Company to remove 1.83 miles of track from a portion of the old Salem line which cuts off at Twentieth and Orange Streets and to substitute service by bus on the route to Washington Heights, which is about a mile from the city.

✦

Boston, Mass.—The Boston Elevated Railway has asked for permission to establish two new bus lines in Dorchester. Fares will be 5 cents without transfer, and 10 cents with transfer privileges.

Service Changes

Oakland, Cal.—The application of the East Bay Street Railways, Ltd., for permission to reroute and consolidate street car lines Nos. 11 and 15, serving 38th and Oakland Avenues, has been denied by the State Railroad Commission.

✦

Providence, R. I.—Discontinuance of railway service on the Promenade Street line here is sought in a petition filed by the United Electric Railways with the Public Utilities Commission. The petition involves only trolley service—not bus service—on Promenade, Valley and Rathbun Streets.

✦

Berkeley, Cal.—The East Bay Street Railways, Ltd., and East Bay Motor Coach Lines, Ltd., have petitioned the Railroad Commission, the one to abandon a portion of its railway service on its No. 3, Grove Street Line, in Berkeley, and the other to operate a motor coach line in place of the service so abandoned. Authority is asked to remove the track since city officials are about to reconstruct portions of the streets, and have consented to the removal.

✦

Wheeling, W. Va.—The Wheeling Traction Company has placed one-man cars in service between Martins Ferry and Yorkville.

✦

Rochester, N. Y.—Twenty-two one-man cars have been placed in operation on the Main Street East and Main Street West line and the Parsells Avenue and Genesee Street route of the New York State Railways. John F. Uffert, general manager, explains that the one-man service provides more frequent service on the lines in face of declining revenues. The cars have been newly decorated inside and out. The seats are upholstered in red leather. With the installation of these new one-man cars, this class of service is being operated on all but four of the city lines.

✦

Portland, Ore.—Drastic changes in Oregon Electric Railway passenger schedules have been announced by R. H. Crozier, general passenger agent. Between Albany and Corvallis, buses will be used instead of the rail connection from Gray to Corvallis.

Congratulations!

WE TAKE off our hat to Chairman John N. Shannahan and to the splendid body of men and women who assisted him in the Community Chest drive. And we take off our hat to Omaha — a mighty fine town, the home of a warm-hearted and public spirited citizenry.

In a year of unemployment, reduced wages and salaries, diminished profits, Omaha has given $584,000, with the promise to make it an even $600,000 before the campaign is over. It was asked to give $525,000.

To the discharge of this civic duty Mr. Shannahan has given, not only freely of his money, but, more valuable and more important, the whole of his time and energy and ability for several weeks. Many other citizens, with businesses and private affairs of their own clamoring for attention, have done almost as much.

It is men and women such as these who build fine cities and help make this a great and enduring nation which not all the winds that blow can move from its foundations.

—*Omaha World-Herald.*

Financial News

Brooklyn, N. Y.—According to the *Wall Street Journal,* the Brooklyn-Manhattan Transit Corporation has so increased its holdings of Brooklyn & Queens Transit Corporation common and preferred stocks that in October the holding company received approximately 61 per cent of the surface line operating company's net income, against roughly 58 per cent in the first four months of its fiscal year and 58.3 per cent in September. In September the company added to its holdings of both common and preferred stocks of Brooklyn & Queens Transit. In addition, the Brooklyn-Manhattan Transit's income has been increased by the raising of the Brooklyn & Queens Transit preferred dividend to $6 a share from $5. The first quarterly payment at the higher rate was made Oct. 1.

(*Continued on Page 714*)

Reorganization Plan for Buffalo & Lackawanna

The Public Service Commission has approved the reorganization plan for the Buffalo & Lackawanna Traction Company, and has authorized that company to issue common capital stock of no par value.

The Buffalo & Lackawanna operates from the Buffalo Library to a connection at the city line with the Buffalo & Lake Erie Traction Company, which controls the Buffalo & Lackawanna through ownership of stock. The Buffalo & Lake Erie went into receivership and the property of the Buffalo & Lackawanna reverted to its bondholders. Later the property was sold to Harry Evers as chairman on behalf of a protective committee of bondholders.

The reorganization plan proposed that depositing bondholders of the Buffalo & Lackawanna form a new corporation with an authorized capital of 15,000 shares of no par value common stock, consisting of 12,000 shares of Class A stock which would be distributed to bondholders in the ratio of ten shares for each $1,000 principal amount of bonds, and 3,000 shares of Class B stock designed to secure competent management. The purpose of the reorganization plan was said to be to transfer to the bondholders their interest in the property purchased on their account at the foreclosure sale.

The commission authorized the company to issue 11,450 shares of Class A stock without par value, to be delivered to the Marine Trust Company, Buffalo, as depositary under the bondholders' protective agreement for delivery to depositing bondholders. The issuance of Class B stock in payment for services in advance of their being rendered was not approved. It was stated by the commission that the purpose of rewarding management can be accomplished by assigning a proportion of the net income to management and determining the order of such distribution.

New York's Largest Subway Station Inspected

The 42d Street station of the Eighth Avenue line of New York City's new subway system was inspected recently in its partially completed state in conjunction with the tour conducted by the Eighth Avenue Association. This is the largest subway station in this city. It has a capacity of about 90,000 passengers an hour. The station has a total length of 1,155 ft. When finished, it will have fourteen entrances from the street, two of which will be through adjacent buildings and one or more stairways at each of the intersecting streets leading from the sidewalk to the mezzanine or control level of the station.

Free Rides in Providence

To aid the Retail Trade Board of the Providence Chamber of Commerce on "Providence Day," Dec. 3, the United Electric Railways will bring passengers into the center of Providence, R. I., free of charge between 9 and 11 a.m. According to a petition filed with State Public Utilities Commission, the company is taking this step because it "desires to co-operate by giving free transportation in one direction on said day on all lines running into the traffic and business center of Providence."

All lines will be affected by the free-ride ruling except the Olneyville Square-Eddy Street and the Cranston Street-Branch Avenue bus lines. On the Pawtucket line only persons who board cars south of the city line will be entitled to the free transportation. Persons leaving cars or buses before reaching the center of the city also will be required to pay their fares.

A second petition filed by the company proposes to establish the same plan for the Pawtucket Chamber of Commerce on "Pawtucket Day," the date of which has not yet been set.

Department stores and other business establishments will feature large sales of merchandise at special prices on Dec. 3 in an effort to stimulate business.

Curbing the Cruising Cab in Hoosier City

The Indianapolis city ordinance limiting cruising by taxicabs and requiring all drivers to obtain licenses went into effect on Nov. 16. Passed last April, the ordinance has been held in abeyance at the behest of cab operators who have claimed that the ordinance provisions will seriously affect their business. Cruising for passengers is limited by a provision in the ordinance that all cabs must proceed two blocks before turning to repass a given spot. Other sections of the ordinance provide that cab stands may be authorized only by the Board of Public Safety. Property owners may petition for the establishment of a cab stand, but if the petition is granted the property owners will be required to pay a fee of $25 yearly.

Central Association Activities Reorganized

Prompted by changed general conditions of the electric railway industry and the constantly increasing efficiency of its active subsidiary organizations, the Central Electric Railway Association, through its Executive Committee, has effected a complete reorganization of its activities. In two meetings at Fort Wayne, Ind., Oct. 15 and Nov. 18, 1931, authorization was given to the Central Electric Railway Master Mechanics' Association, the Central Electric Railway Accountants' Association, and the Central Electric Traffic Association to organize as independent associations and to become active as such Jan. 1, 1932. These subsidiary organizations will assume the assets and liabilities of the parent association as of this date, and the Central Electric Railway Association will retire as of Dec. 31, 1931.

The organization now known as the Central Electric Railway Master Mechanics' Association will become the Central Transportation Equipment Association on Jan. 1, 1932. The accountants' and traffic associations will continue under their old names. It is believed by the officials of the central district railways that this reorganization in no way handicaps the various companies' interests in association affairs, but puts them in a stronger position to co-ordinate their activities through their subsidiary organizations.

The Central Electric Traffic Association immediately went into session following the parent Executive Committee's action in their behalf, and elected an Executive Committee for the period of one year. Those elected were as follows:

G. W. Quackenbush, traffic manager Eastern Michigan, Toledo Railroad.
O. H. Lazelle, traffic manager Lake Shore Electric Railway.
Richard Breckenridge, vice-president in charge of traffic Cincinnati & Lake Erie Railroad.
O. H. Murlin, general freight and passenger agent Dayton & Troy Electric Railway.
W. L. Snodgrass, general superintendent in charge of traffic Indiana Railroad System.
H. W. Smith, general freight and passenger agent Northern Indiana Railway.
J. O. Motto, traffic manager Winona Railroad.

Mr. Snodgrass was elected president of this committee and Mr. Lazelle, vice-president.

The Value of Convention Exhibits

THE most important ideas that we can bring home from a convention are new ideas on manufactured products. It is of inestimable value to us, therefore, if we can see at the convention the greatest possible display of equipment and appliances, so that our engineers, our sales managers and our executives can study the progress of the art since the last year and find out what new things there are that we can use on our lines to reduce our costs, and that we can introduce to our customers to improve our load factor and earnings.

We see things that are not brought to our offices for us to look at. We see them under conditions where we can make comparisons. We can look them over together and exchange opinions on them. There is no other such opportunity. And if we take an intelligent advantage of it, that alone is worth many times the cost of the trip to each one of us. That's why I say that the exhibit is worth more than the business sessions. It is the most valuable educational opportunity at the convention.—P. S. ARKWRIGHT, *past-president of the N.E.L.A., writing in "Electrical World."*

Income Bond Interest Omitted

The directors of the United Railways & Electric Company, Baltimore, Md., have decided not to pay interest due on Dec. 1 on the income bonds. The following resolution was passed at a meeting on Nov. 24:

Resolved that upon consideration of the report of the auditors and treasurer showing that for the six-month period ending Nov. 20, 1931, there will be no net earnings applicable to interest on the income bonds, coupon No. 65 be not paid.

The interest on these bonds, which were originally issued in exchange for preferred stock of the company, is cumulative. Since 1910 the company had made regular interest payments. Prior to that coupons for the period from 1904 to 1910 had been funded in a 5 per cent issue due June 1, 1936. The income bonds are without definite maturity date except that principal is payable at the option of the company after March 1, 1949.

Many Changes in Service

Changes in the street car and bus service of San Diego Electric Railway, San Diego, Cal., have been authorized by the Railroad Commission. The changes are in substantial accordance with recommendations contained in an investigation and report on the street transportation facilities of San Diego made by the Railroad Commission upon the joint request of the city and the railway. The commission said it appears unreasonable that the company can continue to operate cars unless a need for them, expressed in traffic, exists. The greater the economy of operation, the more assured is service. The importance of Ocean Beach, it is believed, is fully appreciated by the railway, as witnessed by the high type of service rendered this community. The transfer necessitated by the proposed change will be limited to a few passengers, while it will result in a material saving to the railway and permit a high standard of service.

A.E.R.A. Executive Committee

(*Continued from Page 711*)

is taking a poll of the manufacturers concerning the desirability of having an exhibit at the 1932 A.E.R.A. convention, a suggestion was made that no convention at all be held next year and a series of regional meetings be substituted in its place. Several of the members present expressed approval of this plan, but no formal action was taken, it being decided to canvass the opinion of the industry by letter before making any final decision.

Brief reports were received from various of the standing committees. President Heberle of the Accountants' Association, President Giltner of the Claims Association and President Jones of the Engineering Association told of the plans of their organizations for the coming year. A letter of appreciation was read from the Canadian Electric Railway Association for the courtesies extended to its members during the recent A.E.R.A. convention at Atlantic City. It was decided to hold the next meeting of the American Executive Committee on Jan. 29 at New York.

Financial News

New York, N. Y.—The city, acting through the Transit Commission, and the Interborough Transit Company have reached a settlement with the Department of Internal Revenue under which the Revenue Department has waived its claim for taxes amounting to approximately $850,000 on the payment of approximately $6,291,000 by the I.R.T. to the city for the fiscal year ended June, 1929. The payment was made under an agreement between the Interborough and the city, settling differences over accounting and fund withdrawals under Contract 3.

✦

Johnstown, Pa.—A protective committee for holders of Johnstown Passenger Railway 30-year 4 per cent gold bonds, due on Dec. 1, 1931, has been formed and is asking deposits of bonds. The Johnstown Traction Company, the parent company, is now in receivership, and has advised the bondholders of the Passenger Railway Company, with which it was merged in 1913, that it will not meet the interest due on Dec. 1, on which date the principal of the bonds also will mature.

✦

New York, N. Y.—Holders of the Dry Dock, East Broadway & Battery Railway 5 per cent general mortgage bonds, due on Dec. 1, 1932, have been informed that funds are not available for the payment of semi-annual interest. A total of $950,000 of these bonds are outstanding. The Dry Dock company operates the Avenue B, the Williamsburgh Bridge and the Grand Street Crosstown lines. Third Avenue Railway, which controls the line, has met the deficit up to this time. Recently, however, it was decided not to advance further funds to the Dry Dock company, but it has offered its services to the Dry Dock bondholders to operate the lines at least until such time as the bondholders make other arrangements. The companies of the Third Avenue Railway system own certain Dry Dock securities.

✦

New York, N. Y.—As part of its program for independent operation of New York City's new subway system, the Board of Transportation plans to submit to the Board of Estimate, together with a draft of operating contract, a request for immediate service upon B.-M. T. of intention to recapture the 7-mile Culver Line to Coney Island.

✦

Columbus, Ohio—Street railway and interurban lines come fourth in the amount of excise taxes paid the State for 1931. Steam railroads come first with $2,198,105. Electric power corporations are next with $1,088,188. Telephone companies are next with $815,407, and street railway and interurban lines fourth with $469,551. Excise taxes paid by all utilities for 1931 were $312,364 less than for 1930. This indicates that all utilities combined have suffered a comparatively small decrease in gross revenue as compared to other businesses paying excise taxes to the State.

Providence, R. I.—The New England Power Association, through a subsidiary just formed, the Power Realty Company, is to acquire the power plant of the United Electric Railways here for $2,150,000. Hereafter, the transportation utility, which operates trolley and bus lines throughout Rhode Island's mainland, will purchase its power from the Narragansett Electric Company, another subsidiary of the New England Power Association.

Regulation and Legal

Philadelphia, Pa.—Right of the State Superior Court to decide whether the Broad Street Subway lease by the city to the Philadelphia Rapid Transit Company is "improvident to the taxpayers" was asserted on Nov. 11 by Superior Court Judge Cunningham. The ruling was made in the course of argument before the tribunal on the appeal of former Deputy Comptroller Wilson from the Public Service Commission's approval of the Broad Street Subway lease a year ago. Mr. Warfield said: "I do not ask that the entire lease be nullified, but I ask this court, in view of the fact that the agreement was drawn at a time when Mitten Management, Inc., was in control of the P.R.T., to send the lease back to the Public Service Commission so that proper adjustments may be made." Decision was reserved.

✦

East Chicago, Ill.—A new trial has been granted the Chicago, South Shore & South Bend Railroad in its legal battle to move its tracks here from crowded Chicago Avenue in the center of the business district to a new location near the south bank of the Little Calumet River. Circuit Judge Norton ruled that an act of the recent Legislature revoked the original law which gave the utility the right to relocate tracks, and invested this right in the Public Service Commission. In the first trial, Judge Norton denied the petition of the company to move its right-of-way. The company then filed a similar petition with the Public Service Commission.

General

Seattle, Wash.—By a unanimous vote the City Council has instructed the Board of Public Works to pave with precast concrete slabs the open street car tracks of the Municipal Street Railway on Dexter Avenue. The work will probably be underway by Dec. 1, to prepare Dexter to handle all the traffic to and from the south end of the new George Washington Memorial Bridge during the first several months after its opening next spring. The work will cost $40,000 and will involve reconstruction of the double-track street car line in the center of the avenue before the concrete surfacing slabs can be laid. The estimated cost does not include new railroad ties and rails to be used. The improvement will be financed from money left over in the public fund originally contributed to build the new bridge.

(*Continued on Page 716*)

Six-Hour Day Plan at Detroit Rejected

The railway employees' union in Detroit has rejected the recent proposal made by the Department of Street Railways for a six-hour day instead of the present eight-hour day. It put forward a counter-proposal for a 6-day work schedule instead of seven days. The plan of the department as submitted to the union was designed to spread employment among more of the extra men. The union proposed that all extra work in other departments be given to the platform men not on regular runs, a system tried out earlier in the year but abandoned last March.

Del A. Smith, general manager of the D. S. R., said that a six-day week might prove satisfactory if the off-days could be rotated and not all taken on Sundays.

The problem of increasing shop hours for D. S. R. men to 30 hours a week is being considered by Joseph E. Mills and Judge Jeffries, named several weeks ago to settle the question of shop hours.

Special Cleveland Pass Popular

A Sunday-holiday pass put into effect at Cleveland on Nov. 22 by the Cleveland Railway sells for 25 cents in competition with the following fares in different parts of Greater Cleveland:

City of Cleveland—10 cents cash and four tickets 30 cents with 1 cent transfer.
East Cleveland and Cleveland Heights—local fares same as Cleveland but through rides cost 12 cents cash or five tickets for 45 cents.
Euclid Village—5 cents local and 18 cents through.
Lakewood—5 cents and eleven for 50 cent ticket local, but with Cleveland fares for through rides.

The company sold 16,130 passes, which were used for 134,074 gross rides. The latter included transfers which ordinarily run up to 35 per cent. The revenue for the day was $905 greater than for the average of the three Sundays preceding, viz:

Nov. 1	$19,375
Nov. 8	$19,764
Nov. 15	$18,286
Average	$19,142
Nov. 22 (pass)	$20,047
Gain in revenue (per cent)	4.8

The company's move to popularize service on the days on which patronage has declined most has met with wide commendation.

Fast Bus Service to Los Angeles Harbor

A direct motor coach service is being supplied by the Los Angeles Motor Coach Company between Hollywood and San Pedro, Long Beach and steamers at the Los Angeles Harbor. The new line is the most important new transportation link added in southern California in several years, since it provides through service between the Hollywood and harbor points and fulfills a travel need which has been growing constantly. Permission to operate the new line was received from the Railroad Commission only after hearings lasting several weeks. Four companies competed for the franchise.

Following a course from the heart of Hollywood over the westerly and southerly section of the city, the line passes through a thickly populated district of Los Angeles en route to the harbor. The line to Long Beach diverges, one wing serving Torrance and the other operating direct on South Main Street to Long Beach.

The schedule calls for six round trips daily between Hollywood and Long Beach, five round trips to San Pedro and a number of trips to and from steamers at the docks sufficient to handle the business offered. The running time is one hour and twenty minutes for the 32-mile journey to Long Beach, and one hour and fifteen minutes for the 30.5-mile trip to San Pedro.

The round-trip fare between Hollywood and Long Beach is $1.10 and the one-way fare 60 cents; between San Pedro and Hollywood 55 cents one way and $1 round-trip.

The service saves time and eliminates transfer enroute between Hollywood cars and Pacific Electric interurban trains in Los Angeles, previously the only transportation medium to the harbor. The Los Angeles Motor Coach Company is owned and operated jointly by the Pacific Electric Railway and Los Angeles Railway.

Costs Reduced Sharply, Say Maintenance Men

At well-attended meeting of Middle Atlantic States Equipment Association many improved practices are discussed

NEW cars and new types of equipment require proper devices for repair and testing if satisfactory results are to be obtained was the opinion of those who spoke at the fall meeting of the Middle Atlantic States Equipment Mens' Association, held at York, Pa., on Nov. 19 and 20. The sessions were presided over by J. G. Porter, Richmond, Va., president of the association.

Three principal papers were presented, by J. K. Stotz, Westinghouse Electric & Manufacturing Company, on recent developments in high-speed railway motors; George H. Scragg, Mack-International Motor Truck Company, on schedules; and R. S. Beers, General Electric Company, on testing of railway motor fields. In Mr. Beers' absence the last paper was read by G. R. Hill.

Commutation and Modern Railway Motors

One of the principal problems in the modern railway motor, according to Mr. Stotz, is commutation, which is made more difficult with higher accelerating rates and higher speeds. The penalty is less life between commutator turnings. The biggest offender in producing noise is the gear. The new drives, both the W-N type and the worm, are quiet, but to some extent are dependent on the type of truck with which they are used. Throughout its life the double-reduction gear has the same efficiency as the single.

In the discussion it was brought out by several speakers that the new types of equipment have brought new problems in maintenance. D. E. Frame, Wilmington, Del., believes that shops must be fitted with the proper devices for repairing and testing. This opinion was concurred in by Mr. Porter, W. J. Hicks, Richmond; Morris Buck, New York, and others.

Maintenance costs have been reduced 53 per cent and pull-ins reduced 93 per cent in Richmond, according to Mr. Galloway. A wheel grinder and lathe have been effective in improving wheel maintenance. Construction of a new bus repair shop has resulted in a reduction in bus maintenance costs of $18.50 per 1,000 bus-miles, and pull-ins have gone down 50 per cent.

Considerable discussion developed on methods of reducing maintenance costs at the present time. A. T. Clark, Baltimore, stated that use of new cars has reduced maintenance costs. The purchase of an automatic welder has reduced the car-mile cost of car wheels. Careful adjustments have reduced brake-shoe costs. Adoption of steel cars and a new technique have brought down the cost of repairs after damages in accidents. The total of these savings has been nearly $160,000 in nine months.

H. A. Leonhauser, Baltimore, told how the use of high-speed steels made it possible to speed up the machinery. A case-hardening plant was installed, and the life of the parts treated was increased four to one. Welding is used to reclaim every possible part, with a considerable saving.

E. L. Kelly, Hampton, pointed out that the cost of special shop equipment is a real problem on the small property, and much of it is out of the question. Fred T. Ward, Third Avenue Railway, New York, told of the efficiency studies made on his property. By the use of improved methods, 89 men are now able to repair and turn out six treadle-door cars in five days where formerly five cars were turned out in five days with 100 men. There has been no let-down in the quality of the work. An analysis tells in advance what a job will cost, and how permanent it will be. The real gain that is being made in maintenance by these improved methods, Mr. Ward said, is in putting parts on the cars that will not wear out quickly.

Friday morning's session was devoted entirely to the discussion of prepared questions. W. C. Klein, Allentown, stated that he has been using the trolley shoe exclusively for the past ten years on all high-speed cars. It has eliminated all wire troubles and broken car roofs. It also is much better in sleet. E. G. Deis, Ohio Brass Company, discussed

(*Continued on Page 717*)

Progressive Moves Made by P.R.T. on Improvements

John A. McCarthy, banker and chairman of the City-Company Relationship Committee of the Philadelphia Rapid Transit Company board, in discussing a number of important transit improvements projected by the company, indicated that modernization of the 1907 city-P.R.T. transit agreement is to be sought by the reorganized P.R.T. board of directors in the near future. According to the *Record*, these improvements include:

1. Inauguration of a high-speed transit service between Philadelphia and Camden via the Delaware River Bridge.

2. Inauguration of a new bus line to connect the Roxborough-Wissahickon section with the central business district via the Henry Avenue Bridge.

The P.R.T. board of directors has also named a committee of four to discuss with the city the proposal that the transit company keep trolley tracks off Ridge Avenue, east of Broad Street.

The committee comprises Mr. McCarthy, Dr. Herbert V. Tily, P.R.T. director and president of Strawbridge & Clothier; Ralph T. Senter, president of the railway, and Frederic L. Ballard, its general counsel.

Mr. McCarthy said it is the intention of the reorganized P.R.T. board of directors to take the public into its confidence with respect to the various problems arising in the conduct of its transportation system and the relationship of the city and the P.R.T. To this end a Publicity and Public Relations Committee has been named to accomplish this purpose. The committee comprises Dr. Tily, Mr. McCarthy and George Stuart Patterson, three of the six men appointed last May to the P.R.T. board by Judge McDevitt. Mr. McCarthy is quoted as follows:

> It is the intention of the P.R.T. to extend to the limit of its ability the best available transit service to the people of Philadelphia.
>
> In line with this attitude, the company has started negotiations with the city to establish a bus line from the Wissahickon Station of the Reading Company out Ridge Avenue to City Line. The franchise covering this route is held by the Reading Transit Company, which operates a trolley line out Ridge Avenue to Norristown.
>
> We expect to break even on the operation of this new bus line for the present. We won't make a penny for the next few years, at least, in its operation. It will undoubtedly aid tremendously in the development of the entire Roxborough district, and give the section a transit service now lacking because of the unsatisfactory operation of the present "Toonerville" trolley line.

Mr. McCarthy also said the Delaware River Bridge transit line proposal will be ready in detail for submission to the bridge commission by Dec. 1.

The banker indicated that the East Ridge Avenue trolley track removal proposal now pending in Council will precipitate a comprehensive discussion of city-P.R.T. relations. He said:

> The city must take into consideration the fact that the P.R.T. is now paying $184,000 annual rental to the Ridge Avenue Passenger Railway, one of the underliers, for the Ridge Avenue line. The line is a highly profitable one.

The city of Philadelphia has since agreed to permit the Philadelphia Rapid Transit to relay its tracks on Ridge Avenue east of Broad Street. The step marked abandonment, for the present, of plans to make the avenue a motor boulevard for traffic to and from the Delaware River Bridge. The agreement was made after P.R.T. directors suggested the matter be included as an issue in a future test case to condemn the underliers. This subject will be taken up, it was agreed, when P.R.T. opens negotiations early in 1932 for operation of the Ridge Avenue subway and other subway lines now under construction.

General

(*Continued from Page 714*)

Cleveland, Ohio—N. R. Howard, writing to the New York *Times* for Nov. 22, a long review of local political trends, said that "this week saw petitions put in circulation to enlist the candidacy of Peter Witt, whose position as an independent Democrat is somewhat comparable to Mr. Kohler's on the Republican side. Mr. Witt, now the transit consultant of the Van Sweringen interests, declares he will not run for Mayor, but there will be terrific pressure brought to bear on him."

✦

Portland, Ore.—The Oregon Institute of Technology has established a course in repairing and servicing of buses and trucks. According to James B. Dinsdale, supervisor of the school, the course has been designed for mechanics desiring to specialize in heavy-duty equipment. E. L. Skinner, shop foreman of the Pacific Northwest Public Service Company, Portland, is instructor. Students spend a part of their time at the Center Street shops of the company studying methods used for servicing the buses. Actual work on buses and trucks is done in the local school.

✦

Youngstown, Ohio—The post of City Street Railway Commissioner may be eliminated if Council fails to include in the 1932 appropriation provision for $6,900 a year. Council meeting recently favored the move as an economy measure, and announcement has been made that in making up the new annual budget this salary item will be eliminated. No plan has yet been advanced for supervision of the local railway system under the terms of the Youngstown service-at-cost grant.

✦

New York, N. Y.—Up to the present, the war against the subway smoker has made only slight headway, but the campaign against this particular form of human pest is on again in earnest under stimulus of the city's health department. The railroad companies, especially the Brooklyn-Manhattan Transit Corporation, have from time to time prosecuted educational campaigns, spreading appeal and warning through thousands of circulars and posters. The underground smoker, nevertheless, appears to have stood his ground, and at the height of the latest campaign in May of this year eighteen fires started in the B.-M.T. subway lines in one 24-hour period through the throwing of lighted cigarettes into rubbish cans and onto the railroad ties. During the last six months, the B.-M.T. alone distributed 500,000 warnings to passengers observed smoking or carrying lighted butts on stairways, platforms, passageways or cars of the line.

✦

Toledo, Ohio.—New fare boxes of the Woods closed type which takes in paper tickets, tokens and cash have been installed on the buses of the Community Traction Company to save the drivers annoyance in handling different types of collections. Magazines retain all the receipts, which are counted at the carhouses.

✦

Seattle, Wash. — Publication of an official schedule of street car and bus routes of the Municipal Railway, with time-tables and other information of value to car riders, will be proposed to A. E. Pierce, acting superintendent, as a means of raising revenue for the system.

✦

Birmingham, Ala. — Following the posting of a notice to the effect that 50 motormen and conductors, who have been working part time, would be laid off on Nov. 23, representatives of the union are arranging to confer with officials of the Birmingham Electric Company. The men involved in the proposed lay-off have been working under a "stagger" plan, whereby regular operators laid off two days out of every 21 days, and extra men laid off one day each week. Under the plan now proposed the payrolls would not be reduced since the working time of employees retained would be increased.

✦

New York, N. Y.—The Board of Transportation, which is shortly to advertise the form of contract upon which bids will be sought for the operation of the Eighth Avenue subway, is expected to insist that the operator must be a New York corporation organized under the railroad law. Although the city built the new lines and will provide the necessary equipment to run them, the law does not release the operator from the obligation of providing at least $10,000 capital for every mile operated. The new system, including the 4-mile link of the B. M. T.'s Culver line in Brooklyn, comprises about 60 route-miles.

✦

Kansas City, Mo.—The Kansas City Public Service Company opened for business on Oct. 26 at its new quarters, the Kansas City Public Service Building, at Eighth and Delaware Streets. The building had been remodeled. Former quarters at Fifteenth Street and Grand Avenue were condemned by the city in connection with the Fifteenth Street widening project. Sixty thousand dollars was spent by the company in remodeling the present building, erected in 1887 by the Grand Avenue Cable Company.

✦

Mason City, Iowa—On the occasion of Dollar Day here, the People's Gas & Electric Company did its share in making the event a success. Shoppers were permitted to ride free to shopping centers between 9 and 11 a.m. The offer of free street car service was widely advertised.

Special Fire Prevention Car a Sensation

It is estimated that 9,000 to 10,000 people were admitted to the car fitted up by the Harrisburg Railways, Harrisburg, Pa., to co-operate with the local fire department in their educational work during Fire Prevention Week when the car was on exhibition. Very favorable comments were made in the local papers. With the assistance of the State fire marshall's department the railway was able to obtain a moving picture machine, an operator and several reels of pictures showing various movies of fire hazards. This apparatus was set up in the car, and with the use of black curtain material the interior of the car was darkened and service rendered over the entire system for the week, with stops at various locations at stated advertised times for the free display of these moving pictures. At various times the car was routed to several of the high schools in Harrisburg, and with the co-operation of the department of education the schools, by classes, were sent to attend this moving picture show.

Story of fire prevention spread by street car

Railway Recovers from Careless Truck Driver

According to the Lima *News* a verdict of $200 has been returned in favor of the Western Ohio Railway & Power Company, by the jury hearing the case against C. J. Newton, Indiana truck driver, after 2½ hours of deliberation. A sum of $790.91 had been asked by the plaintiff.

The case was filed by the railway as the result of a collision between a car, operated by the plaintiff, and a truck, owned by the defendant, in St. Marys, Ohio, on March 29, 1931.

The railway contended that the accident was due to negligence on the part of the truck driver. The allegations were denied by the defendant.

Receiver Named for New Haven & Shore Line

Frederick C. Spencer, of Guilford, was appointed temporary receiver of the New Haven & Shore Line Railway, New Haven, Conn., on Nov. 23. Holders of first mortgage bonds of the company made application through the Union & New Haven Trust Company, trustee, for his appointment, and the application was granted by Judge Patrick B. O'Sullivan of the Superior Court. Mr. Spencer said foreclosure of the first mortgage was necessary for reorganization of the company, but there would be no interruption of the company's bus service.

Under the original reorganization plans of the committee, the time limit for acceptance of the company's debentures had expired, but the Bondholders' Protective Committee of the company has instructed the trust company to accept debenture bonds of this railway until further notice. Bonds thus far received total $390,700 in par value out of a total of $460,000 originally issued. The company, once a railway, now operates buses on its shore line. Under the leadership of Mr. Spencer and a new board of directors the company is consolidating and improving its financial position.

Electric and Bus Lines for Short Trips

In order to permit government officials and federal employees to use interurban electric railway lines and bus lines for short trips without going through the regular procedure involved in procuring transportation vouchers, the comptroller general has decided that standard regulations may be modified in such cases. Under the regular procedure government employees traveling on official business are required to obtain transportation requests which they exchange at ticket offices or travel bureaus for tickets. The comptroller general concedes, however, that for short trips over interurban lines or bus lines where the car or bus is boarded at points remote from ticket offices, it would be inconvenient for government people to comply with the rules. Henceforth, in such cases the payment of cash fares will be classified as emergency expenditures.

Maintenance Costs Reduced

(*Continued from Page 715*)

methods of lubricating the wire. C. O. Guernsey, J. G. Brill Company, stated that radio interference is less with trolley shoes, particularly on trolley bus lines.

On the subject of car lamps, Mr. Ward stated that the Third Avenue Railway has wired 103 cars for twenty lamps in series at a cost of $42 per car. The system is so superior that he believes it should be installed on all new cars.

A spirited discussion took place on the subject of methods that can be adopted by the equipment department to increase riding, other than the routine work. Mr. Clark held that the major thing that can be done is to speed up the cars. From an entirely different angle, W. H. McCarty, Washington, believed that the men in the equipment department can make friends by getting them to join outside clubs and engage in civic activities. J. F. Craig, Westinghouse Electric & Manufacturing Company, thinks that all employees should ride the street cars and become familiar with the results of their work.

Mr. McCarty pointed out, on the subject of noise suppression, that the air compressor is a particularly bad offender, and that steps should be taken to quiet it. This can be done by placing it on a support of rubber. Wood blocks bolted to the wheels will quiet them to a marked degree. Trolley bases can be insulated with rubber, and rings can be welded on gears.

It was the opinion of the members that spun-steel wheels have given good results, and that they wear slightly less rapidly than rolled-steel wheels.

President Porter appointed a nominating committee composed of Messrs. McCarty, Kelly and Klein. They will report at the spring meeting. C. E. Keefer, superintendent of overhead and equipment Reading Traction Company, proposed Reading for the next meeting place. His offer was accepted, and the meeting dates were set for May 19 and 20.

In the afternoon the members were the guests of the York Railways. With E. L. Greene as host, they were taken in buses on an inspection trip to the repair shops.

The Trend in Travelling is Towards the Trusty Tram

MANUFACTURERS of cigarettes are perturbed by the alarming increase in the habit of "rolling your own." The trend in coffin nails, in other words, is toward the bent and rusty variety. Instead of four trillion ready-made cigarettes being made in the year or the month, whatever is right, there are probably not more than three trillion nine hundred and ninety-nine billion.

All this points to the fact that it has become smart to be thrifty. The fellow who thought it *infra dig.* to mow his own front pasture, cheerfully gets up on Sunday morning before his golf game to do it.

In the same way, it is fashionable to travel by street car rather than "roll your own." Lots of the best people will be seen in the street cars every day. They are not ashamed to admit that it is a great deal cheaper and they have a use for the money they save.—*"The Buzzer" of the British Columbia Electric Railway.*

FOREIGN NEWS

Consideration of London Transport Bill Postponed

By a special resolution agreed to by both Houses of Parliament, just before the dissolution early in October, the London Passenger Transport Bill was carried over to the new Parliament, to be taken up again at the point which it had reached in its Parliamentary career. Without such a resolution the bill would have died and the £40,000 spent by the Government in connection with its promotion would have been wasted. If the bill fails to pass into law, that charge will fall on the State, but if the bill passes, the transport board constituted by the bill will have to take on the liability.

Co-ordination Was Proposed

It may be recalled that early in the year the Labor Government introduced the bill, the main object of which is to consolidate and co-ordinate all forms of passenger transport within the London traffic area by means of a transport board which is to acquire and carry on all the local railway, tramway, and bus undertakings, with the exception of the suburban lines of the main line railways. The bill was referred to a joint committee of both Houses of Parliament, and that body decided the bill should be allowed to proceed. During those hearings, agreements were reached with the most important of the parties concerned. The one exception was the London County Council. The Council was finally satisfied as to the financial terms on which its tramway undertakings were to be taken over by the Transport Board, but it remained dissatisfied with the proposed constitution of that board. It regarded that body as not sufficiently amendable to public interest and too much a creature of the Ministry of Transport. Hence, on behalf of the London County Council, notice was given of amendments, to be moved when the bill came to the full committee stage in the House of Commons, to alter fundamentally the proposed constitution of the transport board by giving municipal interests a large representation on it.

Labor Government Replaced

Before it found time to proceed with the bill, the Labor Government was superseded and a National Government, composed of representatives of the three political parties, came into power with the sole object of meeting the national financial crisis then existing. Emergency legislation having been speedily passed, the National Government dissolved Parliament, and the general election in October followed. At the time of the meeting of the new Parliament in November, the London Passenger Transport Bill remained still to be dealt with.

In view of the overwhelming majority obtained by the National Government in the end of October, it is difficult to predict what disposition will be made of the London Transport Bill. The Prime Minister seems to be favorably inclined towards it. On the other hand, it is a bill brought forward by the late Labor Government, and its chief sponsor, Mr. Morrison, then Minister of Transport, was defeated at the general election. So were nearly all Ministerial colleagues, and the great majority of the members of the new House of Commons, which is to begin its work on Nov. 10, are Conservatives.

Germ-Killer on English Street Car

Street car passengers in South Shields, England, this winter will have a better chance of fighting off colds and more serious winter ailments, if the new germ-destroying chemicals carried by a recently reconditioned car proves effective. According to a report from Consul William F. Doty, Newcastle-on-Tyne, made public by the Department of Commerce, an old car has been rebuilt and modernized with an installation of ventilators which change the air inside at three minute intervals. Since South Shields street cars are given names, the car replaced in service has been named "Monarch of Bermuda," no doubt as a compliment to the new luxury liner intended for use in the Furness Withy Service from New York to Bermuda.

Buses Superseding Tramcars

Announcements continue to be made in various places in England of the substitution of service by bus for tram service. The movement was at first confined to small tramway undertakings—some company-owned but many municipal—unable to maintain and renew tracks at costs greatly increased since the War. More recently the disposition toward substitution has become increasingly evident. In some cases large bus companies covering extensive areas have entered into running agreements with town councils under which the bus companies have taken over the service obligation of the tramways. In the great cities where tramway traffic is heavy and where track has been well maintained, the disposition toward substitution is not pronounced, but even there the bus is steadily growing in favor as an auxiliary to the tramways, buses being run on routes of light traffic, and also as extensions beyond suburban tramway terminals.

New Subway For Rome

Not long ago an edict was issued excluding street cars from the narrow and congested central area at Rome. Since that time, service between street cars on the outer circle and the center of the city has been maintained by single-deck buses. Now announcement is made that the technical committee of the Rome Metropolitan Railways will invite tenders for the construction of an underground railway to afford transport facilities for an anticipated city population of 2,000,000.

The present central station is to be demolished and rebuilt underground. Two additional underground stations are to be provided, the three being connected by underground electric service. The scheme allows for the construction of six lines radiating from the central station and covering in all 35 miles. Three lines totaling 15 miles in length will be provided in the future; the others will be commenced forthwith, and of these the first will be 6½ miles in length and will cost approximately $15,000,000. The entire project will require from twelve to fifteen years to complete.

London Subway Extension Makes Rapid Progress

Amazingly rapid progress has been made with the extension northwards of the Piccadilly Railway, one of the most important lines of the London Underground Railway system. The full length of the extension from Finsbury Park to Cockfosters is 7½ miles, and it is probable that the first part, from Finsbury Park to Arnos Grove, will be opened by Whitsuntide next year. The remainder, from Arnos Grove through Enfield West to Cockfosters, will be opened a few months later. For the first 4 miles the subway is built at deep level in twin tunnels. Work on this section was started about twelve months ago. A few years ago three years would have been regarded as a reasonable time for the tunneling already done, but operating from nine working sites, placed at intervals approximately one-half mile apart, Greathead shields have been boring steadily through the blue clay lying under London. From 10.30 Sunday night until 2.30 Saturday afternoon the work has proceeded continuously week after week. The heavy blue clay through which the tunnels have been bored has kept the shields to a steady pace, and the rate of progress, which has been more than 1 mile for several of the months, is claimed to have been the highest ever made in Europe.

Riga, Latvia—Following the unsuccessful efforts of the Belgium Concessionaires to renew a contract for the operation of the street railway lines here, the city government may take over the lines. Those in touch with the situation are led to believe that the city desires to purchase American equipment and to adopt certain American operating methods.

✦

Paris, France—Plans were made some time ago to electrify the Paris-Lyons-Mediterranean Railroad, but the program must be carried out gradually owing to the cost. Shortly, however, the 84 miles between Culoz and Modane will be electrified. Power will be furnished by seven power stations driven by the Arly, the Doron, and the Beaufort Rivers. It is hoped gradually to electrify a number of lines in the southeast of France served by the P.L.M. The electrification of the Riviera line, with its many tunnels, will be especially welcome.

✦

Hamilton, Bermuda—The new railway line from Hamilton to Somerset, about 9 miles, recently was placed in operation, and with the construction work on the remaining section of 12 miles to St. George well in hand, the completion of the work is assured within the period allowed by the authorizing

act. The railway will traverse the length of the island, and the system will be operated by petrol-driven rolling stock. The cars follow the European custom of dividing the travel coaches into first and second-class compartments. Since its discovery in the sixteenth century, Bermuda has been dependent almost entirely upon horse-drawn vehicles, augmented in later years by the bicycle as a means of transportation.

✦

Warsaw, Poland—A scheme drawn up by M. Joseph Lenartowicz, the chief engineer of the municipal tramways here, for the construction of a system of underground and overhead electric railwasy is at present under consideration by the Municipal Council. The projected lines would embrace 16¼ miles of underground and 12¼ miles of overhead lines.

✦

Kirkcaldy, Scotland.—The Town Council has operated the tramways in the burgh for many years, but not with much financial success. Now it has accepted an offer from a bus company for a monopoly of passenger transport rights in the town. The company will make a cash payment of £27,000 and an annual payment of £2,000 during a 21-year lease. The tramways will be discontinued.

✦

Kiev, Russia—The foundation was laid recently for a new surface car building plant near the Dombal shop in Kiev. The new plant will be equipped with machinery of the most modern type. Its daily capacity will be six cars.

✦

Derby, England—In connection with the proposed conversion of the Derby tramways to the trolley bus system, the Tramways Committee has decided that the new vehicles shall be fitted throughout with safety glass at an extra cost of £40 per vehicle.

✦

Rosario, Argentine—This city reports an arrangement between its street railway company and provincial authorities whereby service will not be suspended as threatened. The province has agreed to abolish all bus service on routes over which street cars are run, and to permit an increase in fare from 10 to 15 cents on Sundays.

✦

Huddersfield, England—The development of the tram car in England, from the point of view of the passenger, proceeds apace. A prominent example is afforded by the Huddersfield Corporation, which has built six double-deck cars at a cost of £2,486 each. Fitted with 50-hp. motors, the cars are capable of a speed of 40 m.p.h. The cars have luxuriously upholstered seats. Concealed electric lamps give a soft light.

✦

London, England—A bill jointly promoted by the London Electric, the Metropolitan District, and the Central London Railways has been passed by Parliament, one of the objects of which is to extend the Baker Street & Waterloo Railway for 1¾ miles to a point in South London called Camberwell Green. Other objects are to reconstruct and improve a number of existing stations on the railways. Part of the cost is to be met out of capital authorized in 1930, but is proposed to raise £1,500,000.

Leningrad, Russia—The Soviet engineer, F. P. Kazantsev, has turned over gratis to the Transport Institute for Inventions and Improvements his invention of an electro-pneumatic brake. It is claimed that this brake assures complete safety of passenger trains, regardless of the speed at which they are running.

BOOK REVIEWS

Crowded Years

"The Reminiscences of William G. McAdoo," published by Houghton, Mifflin Company, Boston, Mass.; 542 pages. Price $5.

"Crowded Years" is an arresting title. So is the book. Naturally the chief appeal of these reminiscenses among men in the utility field may be expected to be Mr. McAdoo's early work in the electrification of the street railway lines in Knoxville, his part in promoting and operating the tunnels of the Hudson & Manhattan Railroad under the Hudson River and his treatment of the administration of the railroads under government auspices; but the book is the story of the work of a great executive in many lines of endeavor carried out under the most trying circumstances.

To attempt to review the contents of "Crowded Years" is out of the question in a summary such as this. Only a hint can be given here and there. For instance in the chapter "An Adventure in Electricty," Mr. McAdoo, in discussing the pioneer work in electrifying the railway at Knoxville, says that his preference for tangibles had its drawbacks, for tangible realities sometimes possess the characteristics of enraged bulls. "Once brought into being," he says, "they often have such a ferocious aspect that one can only cling to the tail and pray for help." This, indeed, is a chapter that the older men in this industry will appreciate, while to the younger men it will unfold the drama of the adventurers who made possible the industry of which they are now a part.

Similarly the chapter "Burrowing Under the Hudson River" is the story of an obsession that would not be denied. For eleven years, Mr. McAdoo was president of the tunnel companies. He says that the millions he was supposed to have made out of this enterprise are mythical millions. He does not set down the facts by way of complaint, but merely as items of history. And what items they are! As Mr. McAdoo so aptly says: "Business sense is the capacity to manage a business in an orderly and profitable manner, while money-making is the expression of the acquisitive sense." And Mr. McAdoo left this industry a rich legacy in his policy "The Public Be Pleased." He was one of the first and one of the best public relations men the industry has ever had.

Again in the chapters "The Plight of the Railroads," "Director-General of Railroads" and "Raising Wages on the Railroads," Mr. McAdoo has set down facts that needed to be set down.

It would, indeed, be surprising if a man with the wealth of contacts the author had and the myriad of experiences did not generalize now and then. Mr. McAdoo does. For instance, in "Ideas That Became Realities," he says:

> A small-minded, carping executive who goes about rasping and fault-finding over trifles inevitably destroys efficiency. Subordinates who have ideas in their heads shut up like clams, they lose initiative and vigor, and if such a policy is continued, many of them become fawning, bootlicking toadies and hypocrites.
>
> The way to get loyalty and service is to pick men with great care. Have all your doubts and misgivings before and not after you give them responsible posts. If you cannot erase your doubts, then it is unwise to take that particular man, but once the man is selected, tell him what you want clearly and frankly. Keep nothing in reserve. Let him have your whole mind. Then give him enough rope to do the job.

In conclusion Mr. McAdoo says:

> Defeat, when it has come my way, has never left me sour or disappointed; and I can say with sincerity that through good luck or bad, fair weather or foul, success or failure, cynicism has not conquered me nor has my faith in humanity been impaired. My life has covered a wide range and it has been full of interesting and unexpected adventure. I have no quarrel with Fate, no matter in what moods I have found her, and no matter what her decrees have been. I have had a glorious time.

All of which is a conclusion inescapable to the reader of "Crowded Years."

For Corporate Workers

"Formal Corporate Practice, Working Methods and Systems," by William H. Crow, A. B., LL.B. Published by Burrell-Snow, Inc., New York; 1,530 pages. Price, $10.

Corporation officials everywhere should welcome this work by Mr. Crow. It is not enough that it should find a place in the library of corporations for ready reference, but the executive everywhere down the line concerned with corporate procedure should have it as part of his own personal equipment, no matter how well schooled he may be. Designed to be a working tool and guide for all persons concerned with, or called upon to participate in, the formal activities of the corporation, it relates to those affairs of the corporation that are shaped and influenced by its character as a creature of the law. The text largely excludes those divisions of corporate activities relating to corporation accounting and corporation finance, as each of these branches requires a comprehensive treatment in itself.

Reviewers take publishers pronouncements *cum grano salis.* Not that publishers are not sincere about what they believe about the works for which they stand sponsor, but reviewers come to know that often there is a wide gulf between promise and performance. In Mr. Crow's work promise and performance do not part company. The publisher states the matter concisely and correctly when he says that the treatise describes the work of each of the corporate officers, shows the interrelation of offices, and reveals how chief executives of national reputation maintain control over the work of their subordinates.

On the other hand, the author is fully justified in saying that although the book was constructed to fill the function of a reference book, wherefrom experienced officers or attorneys could quickly refer to a discussion or precedent bearing upon the problem of the instant, the effort was to develop the progressive topics in as plain and untechnical a manner as possible. In short, the work affords a medium, hitherto unavailable in the field, in anything like comparable form, for the education of aspirants to corporate offices.

PERSONAL MENTION

Senator's Son Heads Detroit Council

A new political star is being hailed in Detroit as a result of the election of 29-year-old Frank Couzens, son of Senator James Couzens, as president of the City Council.

The huge vote which young Couzens piled up at the election on Nov. 3 to outdistance all his rivals for a seat in the nine-man Council overshadowed even the re-election of Mayor Frank Murphy, who easily defeated Harold H. Emmons. By the provisions of the city charter, the high man becomes president of the Council.

Frank Couzens has served as member of the Planning Commission and the Street Railway Commission. On Nov. 3 he sought his first elective office. As the *Consolidated Press* sees it, the election of Mr. Couzens and Mr. Murphy on the same day gives to the Detroit political picture a May-time tone. Mr. Murphy is still in this thirties, Mr. Couzens in his twenties. Mr. Couzens, as president of the Council, will be acting Mayor during Mr. Murphy's absence, although he is under the age requirement for Mayor.

As noted in ELECTRIC RAILWAY JOURNAL NEWS for Nov. 7, page 222, the amendment to the Detroit city charter providing that the proceeds from the sale of public utility bonds can be used for the improvement, extension, reconstruction and replacement, or the preservation of the Detroit Municipal Railway was carried at the election on Nov. 3.

O. H. Hansen in Accounting Post With Indiana Railroad

O. H. Hansen, auditor of passenger revenue for the Chicago, South Shore & South Bend Railroad, has been made auditor of passenger revenue for the Indiana Railroad, with his offices in Indianapolis.

Mr. Hansen will be succeeded in the Michigan City offices of the South Shore line by Eric M. Dickson, who came to the South Shore line from Chicago last August. Mr. Dickson was previously connected with the Metropolitan Motor Coach Company.

In his new position Mr. Hansen will supervise passenger accounts for the Indiana Railroad, an extensive system which operates throughout the central and southern part of the State. He has just completed 21 years of service with the South Shore line. He was successively cashier, paymaster and supervisor of passenger revenues during his connection with the railroad.

Westinghouse Advertising Manager

Ralph Leavenworth has been appointed general advertising manager of the Westinghouse Electric & Manufacturing Company. He will have charge of all advertising and publicity activities of the company including the advertising division of the merchandising department, now centered in Mansfield, Ohio.

Graduating from Hamilton College, Clinton, N. Y., in 1914, he served with the Y.M.C.A., at Cleveland for four years. After the War he joined the Standard Parts Company, also located in Cleveland, and except for a short period, during which he served as personnel director for a publishing firm, he was advertising manager of this concern, until 1923. In that year he became an account executive for Paul Teas, Inc., an industrial advertising agency. He remained with this firm six years, becoming part owner of the company.

On Jan. 1, 1930, he joined the Austin Company, Cleveland, construction engineers, as assistant general sales manager, serving in an executive capacity on sales, administrative and advertising work concerned with this international organization.

J. C. McKeen Heads Nova Scotia Company

John C. MacKeen has been elected president of the Nova Scotia Light & Power Company, operating the electric railway in Halifax. He is only 33 years old, being the youngest son of the late David MacKeen, president from 1895 to 1912 of the Halifax Electric Tramways, predecessor of the Nova Scotia Light & Power Company.

J. C. MacKeen was educated at Halifax and at the Royal Military College, Kingston, Ont. In 1926 he became a director of the Nova Scotia Light & Power Company. As president, he succeeds W. H. Covert, recently sworn in as Lieutenant Governor of Nova Scotia. Mr. Covert succeeded as Lieutenant Governor Frank Stanfield, who died recently. Succeeding Mr. Stanfield as a director of the power company is R. J. Macadam, Halifax. Following Mr. MacKeen as vice-president of the company is J. McG. Stewart, Halifax, who has been a director since 1926.

Mr. MacKeen is vice-president of the Royal Securities Corporation, and has been manager of the Halifax branch of that firm since 1925. The case of the Messrs. MacKeens, father and son, is believed to be the only instance in which father and son have served in the presidency of any Canadian electric railway.

Lord Ashfield Named to Canadian Board

Lord Ashfield has accepted Premier Bennett's invitation to head the commission which is to investigate transportation conditions in Canada. Heavy deficits on the Canadian National and serious declines in Canadian Pacific revenues have prompted the inquiry, which, it is hoped, will solve Canada's transportation difficulties. Since 1928 the railways' position has depreciated, partly from freight-rate reductions, partly from motor car and bus competition, but mostly from the depression. The appointment has met with general public accord in Canada, but, as the Montreal *Gazette* sees it, further discussion of the commission's task must be more or less speculative until the commission itself has been formally constituted and the scope of the inquiry defined.

The choice of Lord Ashfield is accepted as particularly commendable in view of the outstanding position which Lord Ashfield, a former president of the Board of Trade, occupies in the British transportation field, and of the very wide experience which he has had. He is chairman of the London Underground Railways and has directed the operation of other electrical services, including surface lines, notably in the United States.

In Great Britain Lord Ashfield, or Albert H. Stanley, as he was known when he served in the United States, has been connected actively with the administration of surface and underground transportation for many years, and he has extensive interests in motor transport and bus services. His practical knowledge, therefore, has been gained on both sides of the Atlantic, and in divisions of the transportation field which, as the *Gazette* said, are certain to engage much study on the part of the commission over whose inquiries he will preside.

F. P. Gruenberg on Pennsylvania Commission

A vacancy in the membership of the State Public Service Commission of Pennsylvania has been filled by Governor Pinchot in the appointment of Frederick P. Gruenberg, of Philadelphia.

Mr. Gruenberg was at one time a department head in the long-established banking firm of Brown Brothers & Company, and latterly was treasurer of the Bankers Securities Corporation of Philadelphia.

For years he was director of the Bureau of Municipal Research, Philadelphia. At one time he was chairman of the Governmental Research Conference, United States and Canada. He was formerly a member of the council of American Political Science Association and has written and lectured widely on civic and economic subjects.

During the legislative sessions of 1917 and 1919 Mr. Gruenberg served on the Citizens' Committee which secured the new charter for Philadelphia. He was secretary of the committee during the 1917 session.

When Governor Sproul appointed a commission to consider a new Constitution in 1920, Mr. Gruenberg worked with a number of the subcommittees in drafting measures and in technical studies on various aspects of their work, particularly affecting public finance and administration.

Edward de Harne, superintendent of way and structures of the Honolulu Rapid Transit Company, returned to the Hawaiian Islands on Nov. 1 after a two-month tour of the United States in the interests of his company. Mr. de Harne visited all of the major electric railway properties in the country.

E. O. Howard, president of the Walker Bank & Trust Company and president of the Utah Light & Traction Company, Salt Lake City, has been appointed chairman of the Salt Lake City unit of the National Credit Corporation, President Hoover's $500,000,000 credit bank. Mr. Howard will have charge of Utah, southern Idaho and eastern Nevada. He is well known in Western financial circles, having been connected with the Walker Bank & Trust Company for many years. In addition to being head of that organization and president of the Utah Light & Traction Company, he is a member of the board of directors of the Salt Lake branch of the Federal Reserve Bank of San Francisco, a director of the Home Fire Insurance Company, the Utah-Idaho Sugar Company, American Packing Company, M. H. Walker Realty Company, and the Strevell-Paterson Hardware Company.

✦

William W. Cloud, president and general manager of the Yellow Cab Company, Baltimore, Md., and president of the National Association of Taxicab Owners, has been appointed chairman of the Committee on Administration of the Convention and Visitors Bureau of the Baltimore Association of Commerce Mr. Cloud has been prominently identified with the work of the association for a number of years.

✦

Walter J. Cummings has accepted an appointment to the administrative council of Loyola University. Mr. Cummings is president of the Chicago & West Towns Railway, the Calumet & Chicago District Transit Company, the Cummings Car & Coach Company, chairman of the board of the Des Moines Railway and director and vice-president of the J. G. Brill Company. Members of the administrative council of the University include Samuel Insull, Jr., Edward A. Cudahy, Jr., Charles F. Clarke, Mathew J. Hickey, Edward J. Mehren, Stuyvesant Peabody, Martin J. Quigley, David F. Bremner, Lawrence A. Downs and Mr. Cummings.

✦

G. H. Harries, major-general U.S.A. (retired), formerly vice-president for H. M. Byllesby & Company, Chicago, Ill., and for nearly 40 years representative of investors, operators, estimators and consumers of electric energy throughout the country, has retired from the active engineering field. At various consecutive periods, General Harries has been treasurer of the National Electric Light Association, and president of the Association of Edison Illuminating Companies, the American Electric Railway Association and the Illumination Engineering Association. He will live at Los Angeles, Cal.

✦

A. C. Spurr, former general manager of the Wheeling Traction Company, Wheeling, W. Va., who has assumed new duties in the general offices of the Monongahela-West Penn Public Service Company at Pittsburgh, was surprised in the Chamber of Commerce Assembly room of the Market Auditorium recently. Employees of the Wheeling Traction Company and their families were joint sponsors of the testimonial party for their former chief, and as a token of their esteem presented him a gold watch, chain and penknife set.

Dr. H. C. Parmelee Vice-President of McGraw-Hill

Dr. H. C. Parmelee has been elected a vice-president of the McGraw-Hill Publishing Company, Inc., publisher of ELECTRIC RAILWAY JOURNAL, as a natural sequence to the splendid work that he has done since his appointment as editorial director in 1929.

Blank & Stoller

Dr. H. C. Parmelee

Dr. Parmelee has a background that covers the presidency of the Colorado School of Mines and some twenty years' experience in important editorial capacities in the McGraw-Hill Publishing Company. Through his able editorship of *Chemical and Metallugical Engineering,* and as editorial director of the company, Dr. Parmelee has demonstrated amply his ability to be the guiding head of the company's editorial activities.

Dr. Parmelee was born in Omaha, Neb., on Dec. 4, 1874. He was educated in Omaha public schools and later in the University of Nebraska. At the latter institution he pursued the chemical-physical group of studies, receiving the degree of B.S. in 1897, and A.M. in 1899. He was undergraduate assistant in chemistry at the university for one year and graduate instructor for two years.

Several years of commercial laboratory work followed his service as teacher, first as assistant chemist for the Union Pacific Railroad, and later as chief chemist for the Globe plant of the American Smelting & Refining Company. Three years were spent as a consulting chemist in Denver after which he entered editorial work, first as editor of *Mining Reporter,* Denver, and successively as editor of the *Western Chemist and Metallurgist,* Western editor of *Chemical and Metallurgical Engineering* and finally editor of that publication.

The years spent in editorial work were consecutive except for an interim of one year, 1916-1917 during which he was president of the Colorado School of Mines. For several years prior to that he had been a trustee of the Colorado School of Mines. At the close of his presidency the honorary degree of D.S. of Colorado College, Colorado Springs, was conferred upon him.

Dr. Parmelee is a member of the following scientific and engineering societies: American Chemical Society, American Electrochemical Society, Société de Chimie Industrielle, American Institute of Chemical Engineers, Teknik Club, Denver. He is also a member of the Chemists' Club and Engineers' Club, New York.

Ernest M. Massey, since March 25, 1921, assistant secretary of the Market Street Railway, San Francisco, Cal., has been elected secretary of the company to fill the vacancy left by the late George B. Willcutt, vice-president and secretary, who died on Sept. 17. Mr. Massey entered the employ of the United Railroads, the predecessor of the Market Street Railway, on April 1, 1913, as a clerk in the secretary's office. He held that position until he was made assistant secretary in 1921.

✦

Miss Mary McDonough, employed in the street railway system at Seattle, Wash., under private management under the Puget Sound Light & Power Company and its predecessors, including the Seattle Electric Company, and under public ownership, for more than twenty years, has been appointed secretary-stenographer to the Street Railway Commission in that city.

✦

George H. Engels, since 1921 chief accountant for the Market Street Railway, San Francisco, Cal., has been appointed general auditor of that company. The appointment became effective on Nov. 10.

✦

T. J. Day, freight traffic manager of the Pacific Electric Railway in Southern California, has been elected president of the Los Angeles Transporation Club for the ensuing year. He succeeds S. J. Carter of the Pennzoil Company. With his broad experience in railroad work Mr. Day is ideally fitted to carry on the comprehensive program planned by the Transportation Club, the membership of which is made up of persons engaged in electric railway, steam railroad and steamship work. D. W. Pontius, president of the Pacific Electric Railway, acted as master of ceremonies on the occasion of the club's annual dinner dance on Nov. 13 at which Mr. Day was installed.

✦

Aldon J. Anderson, traffic manager of the Salt Lake & Utah Railroad, Salt Lake City, Utah, has been elected as a member of the executive board of the American Short Line Railroad Association for the Pacific region. The election was held at a recent meeting of the association in Louisville. The association is composed of 395 member lines in the United States. The Pacific region embraces Utah, Montana, Wyoming, Colorado, Arizona, Nevada, Washington, Oregon and California.

OBITUARY

Edward E. Gold

Edward E. Gold, inventor of the car heating system now in use on many railroads in the United States, Canada and Europe, died on Oct. 29 of a heart attack. He had been ill only 24 hours, and three days before had visited the offices of the Gold Car Heating & Lighting Company, Brooklyn, of which he was chairman of the board. His age was 84.

Mr. Gold was born in Waverly, Ill. As a boy he attended The Gunnery, a private school in Washington, Conn. At the age of eighteen, he went to New York and entered the employ of the Scoville Manufacturing Company.

In 1882 he invented a system for heating railroad cars with steam from the locomotive by means of a steam hose coupler. It did away with coal stoves, practically eliminating the danger of fire in the event of a train wreck. Mr. Gold obtained more than 100 American and foreign patents. He also developed an electric heater for railroad use.

Soon after inventing his steam heating system, Mr. Gold organized the Gold Car Heating Company. The rapidity with which the business grew caused a reorganization in 1903 as the Gold Car Heating & Lighting Company. Mr. Gold was president until three years ago, when he resigned to become chairman of the board Despite his advanced years, he maintained an active interest in the business until his death.

E. P. Sommers

Edgar P. Sommers, former secretary-treasurer of the St. Louis & Suburban Railway, now included in the system of the St. Louis Public Service Company, St. Louis, Mo., died there recently. Mr. Sommers was born in St. Louis on Jan. 21, 1870. He was educated in the public schools of Kirkwood, Mo., and at Knox College, Galesburg, Ill. He began his business career as a clerk in a mercantile establishment and later became auditor for the National Candy Company. His service with the St. Louis & Suburban Railway began in 1899. He was made secretary-treasurer in October, 1902. In the Spanish-American War he served as a second lieutenant for Company D, First Regiment for Volunteer Infantry, later being made captain. He was a member of the Military Order of Foreign Wars, the Military and Naval Order of the Spanish-American War and the United Spanish War Veterans.

H. A. Carson

Howard A. Carson, famous subway engineer and chief engineer of the Boston Transit Commission for many years died on Oct. 26 at his home in Malden, Mass., aged 88. He was graduated from the Massachusetts Institute of Technology in 1869. After serving as assistant engineer of the water works at Providence, R. I., Mr. Carson became superintendent of construction of the Boston Transit System in 1878. He was named chief engineer in 1894, and continued there until 1909. During that time he supervised the construction of the Boston subway, the East Boston and the Washington Street tunnels. His excellent record in this line of underground construction caused him to be consulted in the building of the New York subway and the two-track tunnel under the Detroit River at Detroit, Mich.

H. B. Flowers

Herbert Baker Flowers, former president of the New Orleans Public Service, Inc., and previously vice-president and general manager of the United Railways & Electric Company, Baltimore, Md., died in Baltimore on Nov. 24 from pistol wounds self inflicted. Friends and associates were unable to ascribe a tangible reason for Mr. Flowers' act, other than that he had brooded over the death of a friend, although there had been no outward indication that this bereavement and the further

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H. B. Flowers

one of the death some time ago of Mrs. Flowers had served to depress him to the point of despondency.

Mr. Flowers become general manager of the company in Baltimore in 1919, when he was promoted from assistant general manager to succeed James R. Pratt, who was made vice-president and placed at the head of the claims department.

He was graduated from the law school of the University of Michigan in 1903 and from the engineering school of that university in 1905. He went into the operating department of the Detroit United Railway, taking a position in the office of Lord Stanley, the general superintendent, now head of the London Underground Railways.

Eighteen years ago Mr. Flowers went to Baltimore to take a position with the United as assistant superintendent of transportation. In 1917 he became assistant general manager.

He went to New Orleans early in 1923, then to take charge of the local company, then it is formative stages under new ownership. In that city he carried on intensively as executive head of a property which included not only the transportation service, but light and power and gas as well. He retired from the company at New Orleans more than a year ago, but not until the matters of supplying New Orleans with natural gas and the issues growing out of the precipitate strike of the transportation employees there had been met and solved. His unusual schooling in both the law and in engineering enabled him to bring this combination of knowledge to bear on the problems before him not only in his corporate work but in the wider field of activities of the national associations, notably in American Electric Railway Association affairs having to do with the one-man car, traffic signals and trackless transportation.

Seymour Mandelbaum, 81 years of age, for many years one of the leading business men of Baltimore and a director of the United Railways & Electric Company, Baltimore, died at his suite in the Belvedere Hotel on Nov. 1.

✦

Nathaniel Curry, Amherst, N. S., first president of the Canadian Car Company, and a director of the Montreal Tramways, died at Tidnish, N. S., following a heart attack. Since 1912 he had been a member of the Canadian Senate. He was made president of the Canadian Car Company in 1909, but more recently had been chairman of the board. He was 80 years old.

✦

Frank Stanfield, aged 60, lieutenant governor of Nova Scotia, and thrice elected to the Nova Scotia Legislature, is dead. Mr. Stanfield was a director of the Nova Scotia Light & Power Company, operating the electric railway in Halifax.

✦

Robert Lund Horsfield, general manager and engineer of Leeds (England) Corporation Tramways and Motors, is dead. He had been manager since 1928. He had a varied career in tramway work, both with companies and with municipalities. As an expert he was often called on for advice, and for many years he was a member of the executive council of the Municipal Tramways & Transport Association. Of that body he was president in 1926-7.

✦

Patrick O'Marie, a division superintendent of the Market Street Railway, San Francisco, Cal., by which he had been employed 33 years, is dead, following injuries received in an accident in his own home when he tripped and fell downstairs.

✦

Henry V. Neal, 83 years old, died at his home in Everett, Mass., recently. For many years he was with the Boston Elevated Railway. He is survived by a son, J. Henry Neal, also long an officer of the railway.

✦

Prof. Henry M. Tyler, professor emeritus of Greek at Smith College and for many years president of the Northampton Street Railway, Northampton, Mass., died at his home in Northampton on Nov. 3, at the age of 88 years.

✦

Edward A. Young, treasurer of the Clinton Street Railway, Clinton, Iowa, died on Nov. 12 after an illness of nearly a year. Mr. Young was prominent as an executive in banking, newspaper and lumber industries, and was well known in fraternal and club activities.

Industry Market and Trade News

Capital Traction Company to Buy 35 New Cars

An expenditure of nearly $700,000 by the Capital Traction Company to purchase 35 new cars is involved in the negotiations which that company announced recently. Purchase of the 35 cars to replace old equipment was authorized by the board of directors at its meeting last May. The company is now in a position, it was said, to sign contracts for this new equipment within a short time. Delivery is to be made as soon as possible and the appearance of the cars on Washington streets is expected probably in February.

The new cars, fully equipped, will cost about $700,000 and company officials indicated that if they prove attractive to the riding public further plans for the replacement of its old cars with new ones will be carried out in the next few years.

The 35 new cars will have four motors each, will weigh about 31,000 lb., or 10,000 lb. less than the old cars.

Electro-Pneumatic Control Subway Cars

Electro-pneumatic control equipment costing $1,230,000 has been ordered by the Board of Transportation of New York City from the Westinghouse Electric & Manufacturing Company. This control apparatus will be used on the 500 new subway cars for the city's rapid transit system.

The electro-pneumatic control permits the operation of trains made up of eleven subway cars. It provides full automatic acceleration and maintains the same accelerating and braking rates regardless of the loading of the car. The control equipments for the 500 cars just ordered are duplicates of those on the 300 cars that were purchased two years ago by New York City for its Eighth Avenue Subway.

New Southern Representative for Cleveland Pneumatic Tool

F. H. Burr, director of the automotive division of the Cleveland Pneumatic Tool Company, manufacturers of Cleco Air Springs for trucks and buses, and all kinds of air-operated tools, appliances and accessories, has announced the appointment of the Harris Rim & Wheel Company, of Atlanta, Ga., as distributor for air springs in that State.

John A. Harris, head of the company, has been in the rim and wheel business since 1918. Until 1928 his works were in Philadelphia. He then opened a shop in Atlanta as direct factory representative for various rim and wheel manufacturers.

Along with merchandising through dealers and jobbers in Georgia and parts of five other States, the Harris Rim & Wheel Company maintains complete shop service. It has close contact with bus and truck operators. In addition to Mr. Harris, his force includes among others two salesmen and three experienced shop men. In addition to the Cleveland Pneumatic Tool Company, Mr. Harris represents thirteen other concerns providing automotive equipment.

No Change in Tire Prices

Leading tire manufacturers are entering the spring-dating period for tire sales with no change in prices on any of the various lines manufactured. Companies which have made no changes include the Goodyear Tire & Rubber Company, Firestone Tire & Rubber Company, the B. F. Goodrich Company, and General Tire & Rubber Company.

The spring-dating period extends from Nov. 15 to May 15, and is the period within which dealers lay in stocks for spring business. The prices made at the beginning of that period are guaranteed to dealers against decline, meaning that if lower prices are later affected in the period dealers are rebated on tires bought at previous price.

Bus Deliveries

Alexandria, Barcroft & Washington Rapid Transit Company, Alexandria, Va., two Yellow Coach, 29-passenger, city type.

Baltimore Coach Company, Baltimore, Md., 22 Mack, 33-passenger, Model BK.

Boston Elevated Railway, Boston, Mass., one Mack, 44-passenger, Model BT; and five A.C.F., metropolitan type.

Brooklyn Bus Corporation, Brooklyn, N. Y., one Mack, 44-passenger, Model BT; and 24 Twin Coach, Model 30.

Department of Street Railways, City of Detroit, Mich., five A.C.F., 33-passenger, street car type.

Duluth Street Railway, Duluth, Minn., two Twin Coach, Model 20.

Duluth Superior Coach Company, Superior, Wis., one Yellow Coach, 21-passenger, city type.

Key System Transit Company, Oakland, Cal., one Twin Coach, Model 15.

Lehigh Valley Transit Company, Allentown, Pa., three Mack, 37-passenger, Model BK.

Middlesex & Boston Street Railway, Newtonville, Mass., one White, Model 65A.

Springfield Street Railway, Springfield, Mass., four Yellow Coach, 38-passenger, city type.

Syracuse & Eastern Railroad, Syracuse, N. Y., five White, Model 65A.

Third Avenue Railway, New York, N. Y., one White, Model 54A.

Virginia Electric & Power Company, Norfolk, Va., four Mack, 22-passenger, Model BG.

West Ridge Transportation Company, Girard, Pa., two Yellow Coach, 21-passenger, city type.

F. J. & G. Orders Five High-Speed Interurban Cars

Five streamlined cars, similar to the cars recently placed in service by the Philadelphia & Western Railway, have been ordered by the Fonda, Johnstown & Gloversville Railroad from the J. G. Brill Company for delivery in the latter part of December. These cars will be used on the double-track interurban line between Gloversville and Schenectady, N. Y. The new cars will be single-end double-truck, one-man operated and will seat 48 passengers.

The Interstate Commerce Commission has been asked to approve issuance of notes aggregating $75,000 to be secured by an equipment lease warrant on the cars. The company will pay $25,000 out of cash.

Detailed specifications of the cars follow:

Type of unit	One-man, motor, passenger, interurban single end, double truck
Weights: Car body	17,000 lb.
Trucks	14,200 lb.
Total	41,800 lb.
Bolster centers	25 ft.
Length over all	46 ft. 11 in.
Truck wheelbase	6 ft.
Width over all	9 ft. 2½ in
Height, rail to trolley base	10 ft. 9½ in.
Window post spacing	33 in.
Body	Aluminum
Roof	Arch
Doors	End folding
Air brakes	General Electric
Armature bearings	Plain
Axles	Annealed steel
Car signal system	Elec. Service Supplies Co.
Compressors	General Electric, CP-127B
Conduit	Duraduct
Control	General Electric, type K
Couplers	Portable bar
Curtain fixtures	Adams & Westlake
Curtain material	Pantasote
Destination signs	Elec. Service Supplies Co.
Door mechanism	National Pneumatic Co.
Fare boxes	National Cash Register
Finish	Du Lux
Floor covering	Linoleum, Armstrong Cork Co.
Gears and pinions	General Electric, heat-treated
Glass	Non-shatterable, Libby-Owens Co.
Hand brakes	Peacock staffless
Hand straps	Stainless steel tubing
Heat insulating material	Compressed cork, Armstrong Cork Co.
Heaters	Consolidated Car Heating Co.
Headlights	Elec. Service Supplies Co.
Headlining	Aluminum
Interior trim	Chromium plated
Journal bearings	Plain
Journal boxes	Semi-steel, J. G. Brill
Lamp fixtures	Elec. Service Supplies Co.
Motors	Four GE-301, inside hung
Roof material	Oregon fir
Safety car devices	Dead man control
Sash fixtures	Stainless steel, O. M. Edwards
Seats	J. G. Brill, No. 308
Seat spacing	33 in.
Seating material	Leather
Slack adjusters	J. G. Brill, mechanical
Step treads	Wood & Kasa, strips
Trolley retrievers	Ohio Brass Co.
Trolley base	General Electric Co.
Trolley wheels	General Electric Co.
Trucks	J. G. Brill, 89-E-1
Ventilators	J. G. Brill, forced draft
Wheels	Rolled steel, diameter 28 in.

Seven Trolley Buses for Fitchburg

The Fitchburg & Leominster Street Railway, Fitchburg, Mass., has ordered seven buses, each seating 40 passengers, from the J. G. Brill Company for delivery shortly after Jan. 1. The trolley buses will be substituted for all the electric car operation, amounting to 12 miles of double line. The General Electric Company will supply the motors and control for the vehicles. The overhead material will be purchased from the Ohio Brass Company at a cost of $35,000.

Trade Notes

National Pneumatic Company was awarded the order for pneumatically operated folding doors for the 22 trolley buses to be built for Kenosha, Wis., by General Motors and the St. Louis Car Company.

J. G. Brill Company has received an order for four 30-passenger trolley buses from the Kansas Power & Light Company, Topeka, Kan.

A. M. Byers Company announces the appointment of W. J. Wignall, formerly vice-president of the Locomotive Terminal Improvement Company, as director of railroad sales with headquarters in Pittsburgh.

Ohmer Register Company, a wholly owned subsidiary of the Ohmer Fare Register Company, was incorporated under the laws of the State of Ohio on Oct. 24, 1931. The Ohmer Register Company will act as the sales agent for the products manufactured by the parent Company.

H. W. Kilkenny has resigned as St. Louis branch office manager of the Ohio Brass Company. Mr. Kilkenny, who has been actively identified with the electrical industry since 1907, is financially interested in his brother's company, the J. G. Kilkenny Company, manufacturers' agents, of Cleveland, Ohio.

F. A. Keihn has been appointed sales engineer of the J. G. Brill Company, Philadelphia, Pa. While Mr. Keihn has been sales engineer of the automotive car division, since 1924, he will now be in charge of all sales engineering matters, reporting to Charles O. Guernsey, whose appointment as chief engineer in charge of all Brill engineering activities was announced in ELECTRIC RAILWAY JOURNAL for October.

General Car & Coach to Dissolve

Edward J. Trimbey has been appointed temporary receiver of all the property of the General Car & Coach Company by Justice Rogers of the Supreme Court to administer the affairs of the company. Creditors are restrained from beginning any action against the company for recovery. The proceeding is entitled "in the matter of the application of a majority of the directors of the General Car & Coach Company for voluntary dissolution." The court has ordered all persons interested to show cause before J. Edward Singleton, appointed referee for the purpose, why the corporation should not be dissolved. The hearing date has been set for Dec. 21 at the office of the referee in Glens Falls, N. Y.

Conspectus of Indexes for November, 1931

Compiled for Publication in ELECTRIC RAILWAY JOURNAL by

ALBERT S. RICHEY

Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Last Five Years	
				High	Low
Street Railway Fares* 1913 = 4.84	Nov., 1931 7.85	Oct., 1931 7.85	Nov., 1930 7.76	Nov., 1931 7.85	Jan., 1927 7.38
Electric Railway Materials* 1913 = 100	Nov., 1931 116	Oct., 1931 116	Nov., 1930 131	Dec., 1926 159	Aug., 1931 113
Electric Railway Wages* 1913 = 100	Nov., 1931 231.9	Oct., 1931 231.9	Nov., 1930 231.8	April, 1931 233.2	Dec., 1926 226.3
Electric Ry. Construction Cost* Am. Elec. Ry. Assn. 1913 = 100	Nov., 1931 164	Oct., 1931 165	Nov., 1930 194	Nov., 1928 206	Nov., 1931 164
General Construction Cost Eng'g News-Record 1913 = 100	Nov., 1931 169.3	Oct., 1931 169.8	Nov., 1930 198.5	Jan., 1927 211.5	Nov., 1931 169.3
Wholesale Commodities U. S. Bur. Lab. Stat. 1926 = 100	Oct., 1931 68.4	Sept., 1931 69.1	Oct., 1930 82.6	Sept., 1928 100.1	Oct., 1931 68.4
Wholesale Commodities Bradstreet 1913 = 9.21	Nov., 1931 8.09	Oct., 1931 8.30	Nov., 1930 10.06	Jan., 1928 13.57	Nov., 1931 8.09
Retail Food U. S. Bur. Lab. Stat. 1913 = 100	Oct., 1931 119.1	Sept., 1931 119.4	Oct., 1930 144.4	Dec., 1926 161.8	June, 1931 118.3
Cost of Living Nat. Ind. Conf. Bd. 1923 = 100	Sept., 1931 85.6	Aug., 1931 85.9	Sept., 1930 95.4	Nov., 1926 104.0	Sept., 1931 85.6
General Business The Business Week Normal = 100	Nov. 7, 1931 67.8	Oct. 10, 1931 72.5	Nov. 8, 1930 80.1	Oct. 6, 1928 117.6	Oct. 31, 1931 67.8
Industrial Activity Elec. World, kw.-hr. used 1923-25 = 100	Oct., 1931 97.1	Sept., 1931 100.4	Oct., 1930 103.2	Feb., 1929 140.4	Oct., 1931 97.1
Bank Clearings Outside N. Y. City 1926 = 100	Oct., 1931 57.9	Sept., 1931 63.4	Oct., 1930 81.5	Oct., 1929 111.8	Oct., 1931 57.9

*The four index numbers marked with an asterisk are computed by Mr. Richey. 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 115 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

†Revised.

Material Prices

Novembr 25, 1931

Metals—New York

Copper, electrolytic, delivered, cents per lb.	$6.50
Lead	3.85
Nickel, ingot	35.00
Zinc	3.50
Tin, Straits	23.00
Aluminum, 98 to 99 per cent	22.90
Babbitt metal, warehouse	
Commercial grade	34.25
General service	28.50

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Track spikes, ⅝-in. and larger, per 100 lb.	2.70
Tie plates, steel, cents per 100 lb	1.85
Angle bars, cents per 100 lb	2.75
Track bolts, per 100 lb	3.90
Ties, 6m.x8m.x8 ft.	
White Oak, Chicago	1.05
Long leaf pine, New York	1.00

Waste—New York

Waste, wool, cents per lb	10.00
Waste, cotton (100 lb. bale), cents per lb.:	
White	6.00–8.00
Colored	5.00–7.00

Wire—New York

Bare copper wire, cents per lb	8.50
Rubber-covered wire, No. 14, per 1,000 ft.	$3.75
Weatherproof wire base, cents per lb	10.50

Paint Materials—New York

Linseed oil (5 bbl. lots), cents per lb	8.40
White lead in oil (100 lb. keg), cents per lb.	13.25
Red lead in oil	14.75
Turpentine (bbl. lots), cents per gal.	46.25
Putty in linseed oil, 100 lb. tubs, cents per lb.	5.50

Hartware—Pittsburgh

Wire nails, per keg	$1.90
Sheet iron (24 gage), cents per lb.	2.40
Sheet iron, galvanized (24 gage), cents per lb.	2.90
Auto body sheets (20 gage), cents per lb.	3.10
Fender stock (20 gage), cents per lb.	3.15

Bituminous Coal

Pittsburgh mine run, net ton	$1.25–1.35
Central Ill. screenings	0.50–1.00
Kansas screenings, Kansas City	1.25
Big seam, Ala., slack	0.60–1.25
Smokeless mine run, Chicago	1.50–2.00

Paving Materials

Paving stone, granite, 5 in., f.o.b.:	
New York — Grade 1, per thousand	$120.00
Wood block paving 3½ in. 16 lb. treatment, N. Y., per sq.yd., f.o.b.	2.00
Paving brick, 3½x8½x4, N. Y., per 1,000 in. carload lots, f.o.b.	50.00
Paving brick, 3x8½x4, N. Y., per 1,000 in. carload lots, f.o.b.	45.00
Crushed stone, ½-in., N. Y. wholesale, f.o.b. per cu.yd	1.85
Cement, Chicago, in carload lots, without bags, delivered	1.95
Gravel, ½-in., N. Y. cu.yd., wholesale, f.o.b.	1.60
Sand, cu.yd., wholesale, f.o.b.	1.00
Asphalt, in pkg. N. Y., f.o.b. ref., per ton	16.00

Scrap—New York

Heavy copper, cents per lb	4.35
Light copper	3.60
Heavy brass	2.15
Zinc	1.50
Lead, heavy	2.50
Mixed babbitt	3.00
Battery lead plates	0.85
Cast aluminum	4.75
Sheet aluminum	8.25
Auto radiators	2.35
Tires, standard, mixed, per ton	$3.00
Inner tubes, mixed, per cwt.	$1.20

Old Material—Chicago

Steel car axles, net ton	$10.75
Cast iron car wheels, gross ton	8.75
Steel car wheels, gross ton	8.25
Leaf springs, gross ton	9.75
Angle bars, gross ton	8.50
Brake shoes, net ton	6.00
Steel rails (short), gross ton	10.25
Relaying rails, gross ton (65 lb. and heavier)	24.05
Machine shop turnings, gross ton	4.25
Coil springs, gross ton	9.75
Frogs, switches and guards, gross ton	8.00

AN Announcement

EFFECTIVE January 1, 1932, Electric Railway Journal will become TRANSIT JOURNAL.

For 48 years Electric Railway Journal (and its predecessor, Street Railway Journal) has pioneered in the advancement of public transportation. It started with the horse car era. It helped make cable car history.

With the development of the electric motor, the paper foresaw the great possibilities of the electric rail car and the name of the Street Railway Journal was subsequently changed to Electric Railway Journal.

For a generation the electric street car remained almost the sole method of public transit. Then transportation methods again began to change. Today the electric street railway is still a vital phase in community transit but it is not the only element. It has been supplemented by rapid transit lines, motor buses, trolley buses and taxicabs. A great many electric railways have adopted one or more of the newer forms of transportation.

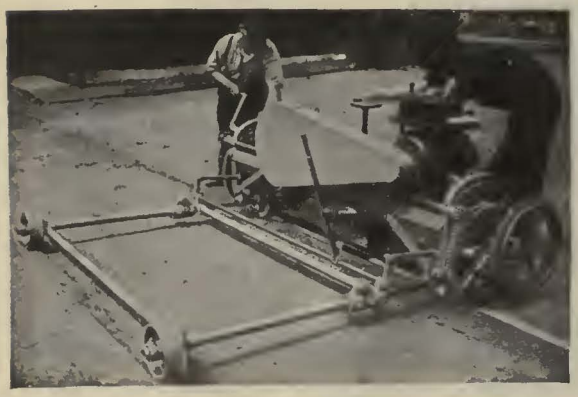
It has been a long step from the simple equipment of the horse car era of the '80's to the wide range of transportation tools used in modern city transit. The electric railway operator of yesterday is a transit merchant today, operating or interested in all methods of transportation, recognizing that each has its economic place in the general scheme of rendering service to the riding public.

By adopting a broader name—one which more accurately reflects its actual field of interest—the Journal will be better able to serve this tremendously important community transit industry. For that reason the name will be changed January 1, 1932, to

TRANSIT JOURNAL

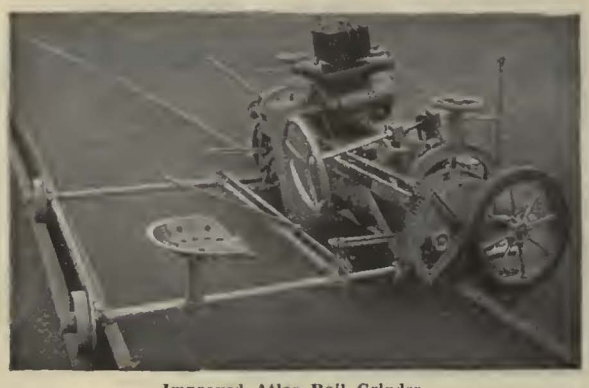
Public Transportation—City, Suburban, Interurban

Reciprocating Track Grinder

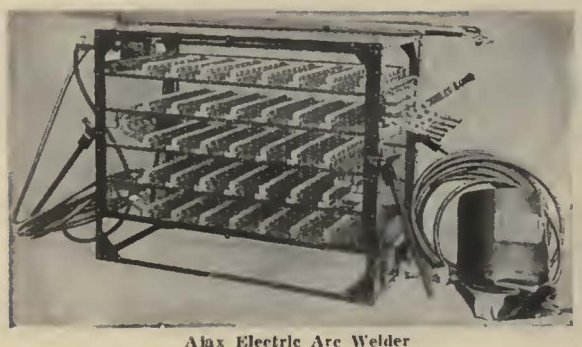


Vulcan Rail Grinder

Enreka Radial Rail Grinder



Improved Atlas Rail Grinder



Ajax Electric Arc Welder

The Hudson Transportation Company has a fleet of 24 buses all equipped with Firestone Gum-Dipped Tires.

3,000,000 MILES *with only* 11 *Road Delays*

TWENTY-FOUR buses, operating one million miles per year. In the three years they have used Firestone Tires and service, the Hudson Transportation Company, Glens Falls, New York, reports "practically no road delays due to tire troubles, during the past three years, the total number being eleven during the entire period."

Every night the entire fleet is checked for air pressure, cuts, bruises, etc.—part of the Firestone service. As the Hudson people say:

"The Firestone Company is ever ready to cooperate to the fullest extent with our Operation Department . . . and to this service is due in no small measure the success of Firestone Tires."

Firestone service, like Firestone Truck and Bus Tires, represents the development of many years of close daily contact with fleet operators in all sections of the country. It can cut YOUR operating costs, too. Find out. Ask your nearest Firestone dealer *how*. You'll be glad you investigated Firestone Tires and Firestone Service.

Firestone
BUS BALLOON

LISTEN TO
The ***Voice of Firestone***
EVERY MONDAY NIGHT
OVER N. B. C. NATIONWIDE NETWORK

Firestone
COMPLETE SERVICE

TIRES • TUBES • BATTERIES • RIMS • BRAKE LINING • SPARK PLUGS • ACCESSORIES

Better Pole Lines are Being Built with

MONOTUBE POLES

ELECTRIC railway officials were among the first to use Union Metal Poles when they were introduced some years ago. Today Fluted Steel and Monotube Poles are being used in many of our largest cities. They are supporting span wires and feeder lines and, in joint service with other utilities, they are carrying distribution lines, street lighting units and traffic signals. Wherever they are used they are doing a better job.

Union Metal Poles are made in one piece from high grade steel, with an electric welded vertical seam and then cold rolled. The poles possess unusual strength; they have no horizontal joints; they are attractive; they will take an abnormal load without a permanent set—factors which provide simple, economical installation and maintenance and long efficient service.

And so we say, better pole lines are being built with Union Metal Poles. If you would like to see for yourself, we would be glad to refer you to an installation of Fluted Steel or Monotube Poles in your locality.

◄►

THE UNION METAL MANUFACTURING COMPANY

GENERAL OFFICES AND FACTORY . . CANTON, OHIO

SALES OFFICES . New York . Chicago . Boston
Los Angeles . San Francisco . Dallas . Atlanta

DISTRIBUTORS

General Electric Merchandise Distributors Graybar Electric Company, Inc.
Offices in all principal cities

● Monotube Poles Installed in Denver, Colorado

UNION METAL MONOTUBE POLES

Is this your problem?

Must operating costs be balanced to meet thin revenues?

Is this your problem?

Is traffic light?

Are operating costs out of line?

Will riding on that planned extension be heavy enough to meet expenses?

Is this your problem?

Then these verified records of "15.39 cents a mile" operating costs should interest you.

What ten widely operated small city operators are averaging—you can average.

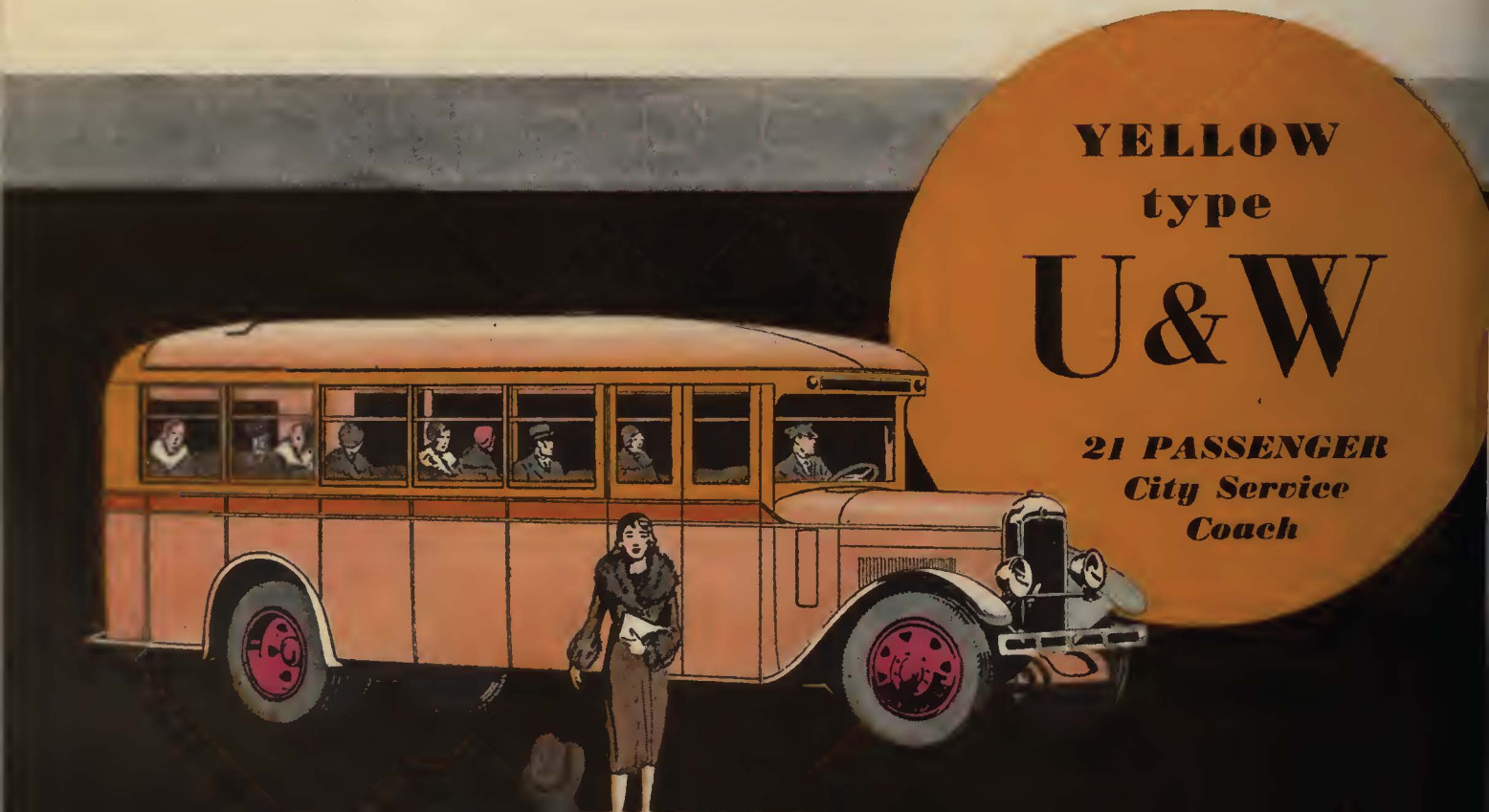
But—You can't get low operating costs like theirs *with any ordinary vehicle*. . . . . .

	Population	Cost Per Mile (Cents)
Company A	21,790	15.22
Company B	129,710	14.84
Company C	13,780	15.13
Company D	76,660	14.58
Company E	76,900	15.30
Company F	39,610	16.20
Company G	31,080	15.01
Company H	5,660	15.35
Company I	45,740	16.80
Company J	16,690	15.49
	Average	15.39

COMPANY D

Expenses	Avg. Per Coach Mile (cents)
Drivers	1.88
Gas & Oil	2.27
Tires	0.87
Maintenance	2.61
Taxes	0.50
Insurance	1.11
General	3.59
Depreciation	1.75
Total	14.58

The details of these and other operating statements of users will be supplied to interested operators upon request.



COMPANY H

Expenses	Avg. Per Coach Mile (cents)
Wages	7.09
Gasoline & Lubrication	1.97
Parts and Supplies	0.45
Tires and Tubes	0.78
Garage Expense	0.15
Advertising and Miscel.	0.70
Insurance	1.09
Taxes and Licenses	0.12
Depreciation	3.00
Total	15.35

...15.39¢ average cost

Nation-wide records prove the low cost of operating Yellow 21-passenger Coaches

From all parts of the country evidence has been growing and accumulating in regard to the extraordinary low operating cost, satisfactory performance and long life of Yellow 21-passenger coaches—Type W and Type U—two coaches of basically similar design.

Over two years ago, General Motors Truck foresaw the industry need of a coach of 21-passenger capacity that would be attractive, safe and comfortable, and that in addition would have exceptionally low operating cost and long service life.

Experienced operators aided in the development of the design. General Motors engineers, backed by vast research laboratories and testing facilities aimed for lasting excellence, regardless of first price, to insure a true low cost per mile of operation and a low depreciation rate.

Cost records, based on millions of miles of actual service, now verify the soundness of the judgment which dictated this original design and foresighted manufacturing policy.

Now, from points all over the country, operators are enthusiastically reporting results *as proven by their cost records.*

Many are reporting 7 and 8 miles to the gallon in city service, less than 2 cents a mile for maintenance, better than 40,000 miles on tires, better than 50,000 miles with brake lining, better than 100,000 miles without engine tear-down or rebore.

And they back up these amazing statements with detail operating figures that show total operating costs of less than 15 cents a mile. Even under widely different operating conditions, difference in personnel, experience, and wages paid, the summary of ten different companies listed, shows an average total cost of only 15.39 cents a mile.

Regardless of varying conditions, we know now that almost any operator can approximate the low operating costs being obtained by so many users of this type of equipment. Interested operators are invited to inquire for further detailed evidence.

GENERAL MOTORS TRUCK CO., *Subsidiary of Yellow Truck & Coach Mfg. Co.,* Pontiac, Michigan

It can be done - with

Yellow Coaches

ROEBLING

When you need signal wires and cables—or any other types of wires and cables for electric railway use—remember that Roebling makes all. In fact, the Roebling Line ranges from magnet wire for winding coils to heavy High Tension Lead Sheathed Power Cables.

Roebling is equipped to give you prompt service, too. Quick shipment of standard types of wires and cables can be made from all warehouse points below.

We would be glad to have an opportunity to furnish information and prices regarding any of the Roebling Wires and Cables listed.

JOHN A. ROEBLING'S SONS COMPANY, TRENTON, N. J.

Atlanta Boston Chicago Cleveland Los Angeles New York
Philadelphia Portland, Ore. San Francisco Seattle
Export Dept.—New York, N.Y.

Railway Signal Wires and Cables » Parkway Cables » Power Cables; Paper, Cambric, Rubber; Braided or Leaded » Car Wire » Locomotive Wire » Bronze Trolley and Contact Wire » Copper Trolley and Contact Wire » Copper Transmission Strand » Guy Wire and Strand » Bond Wires » Ground Wires » Welding Cable; Trailing and Electrode Holder » And a wide variety of other Wires and Cables.

ELECTRICAL WIRES AND CABLES

DOWN TO SEE SOME SHIP BOLTS

WENT A GROUP OF ENGINEERS

BOURKE-WHITE PHOTO

A pickling room operation in an R B & W plant, in which scale and dirt are removed from raw materials.

Galvanized bolting material has its own fit and finish requirements... an R B & W case history

A LARGE American republic had placed orders for construction of naval destroyers and scout cruisers. The ship building company which received the contracts ordered galvanized bolts from R B & W, to be made in accordance with the specifications furnished by the navy department of the government that had ordered the vessels.

But the specifications required a fit of bolt and nut which is not necessary in marine work, and which, in galvanized material, required reducing the thickness of the galvanized coating, with a consequent weakening of protective resistance to the ravages of the elements. The R B & W order department sent the order to our Engineering Service department for instructions. (Of course, it would have been a simple matter to overlook the faulty specifications and ship the order as requested.)

After considerable correspondence and other negotiation, the R B & W Engineering Service arranged to call on the navy's construction engineers and specification writers with a representative of the ship builders. A brief demonstration and explanation with specimen galvanized bolts resulted in a consent to revise the specifications and a ruling that bolt and nut fits as furnished by R B & W would be approved by the inspectors.

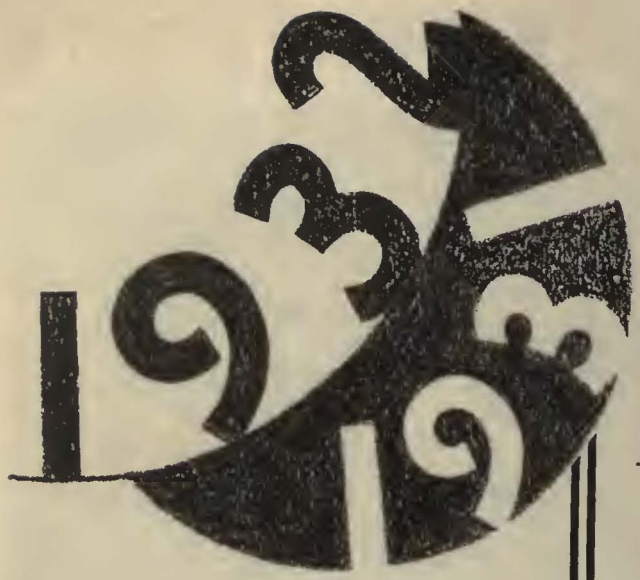
When you have a problem in the correct specification and use of bolting material, put it up to the R B & W Engineering Service.

EMPIRE

RUSSELL, BURDSALL & WARD BOLT & NUT CO.

ROCK FALLS, ILL. PORT CHESTER, N. Y. CORAOPOLIS, PA.

Sales Offices at Phila., Detroit, Chicago, San Francisco, Los Angeles, Seattle, Portland, Ore.



The new year is almost here. What kind of a year it will be we don't know. But— *we do know that many transportation companies will enjoy increased revenue through the active selling of their service to the public.*

In some cases, this will mean revision of transfer design to offer additional transfer privileges or to prevent transfer abuse.

Other properties undoubtedly will adopt various forms of Globe "Bargain Fare" Passes to sell offpeak riding and to obtain cash in advance.

Still others will adopt the new Bell Punch Ticket System for absolute safety in ticket sale and use, on suburban lines. The automatic Hyman Register will help others solve their cash and token problems.

Whatever the conditions, Globe Ticket Specialists are particularly capable of helping you modernize your fare system.

Consult them.

GLOBE

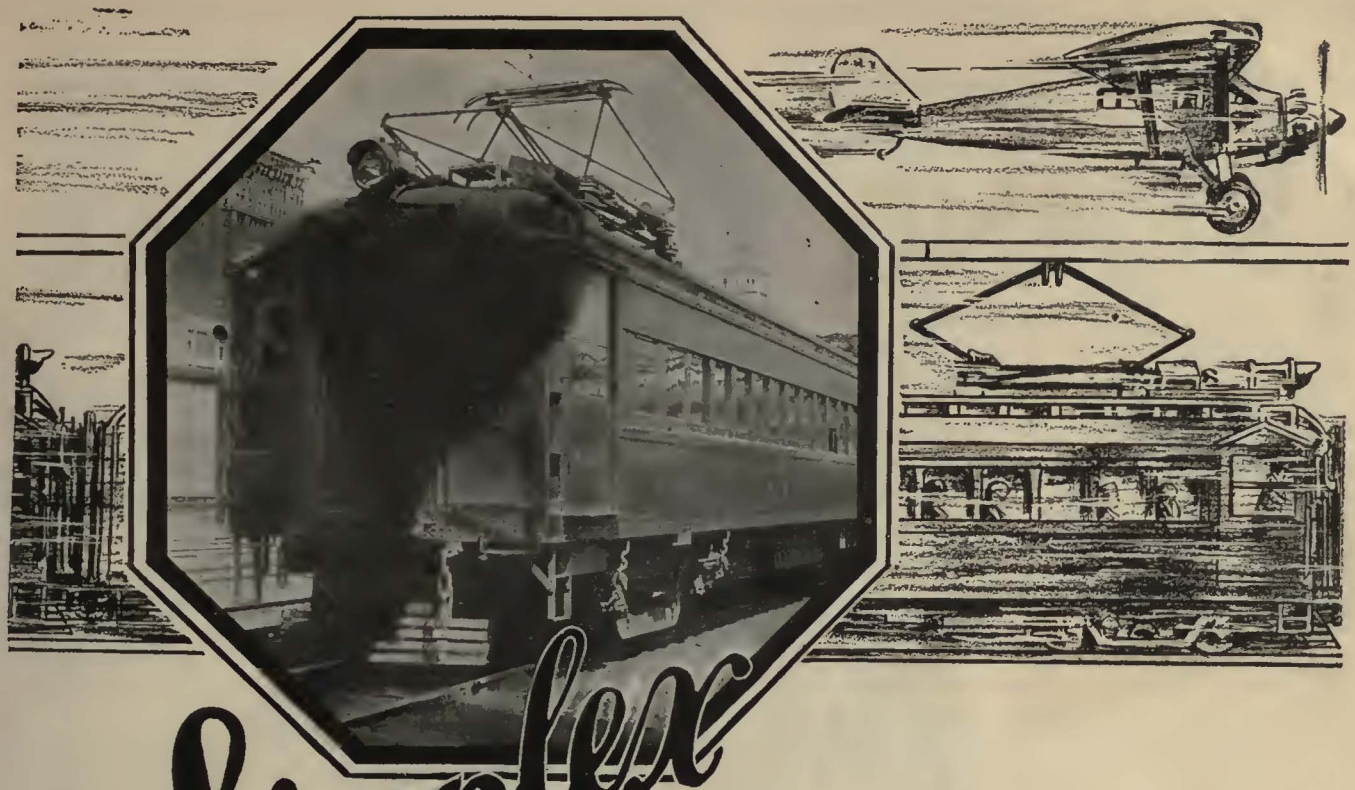
TICKET COMPANY

PHILADELPHIA

FACTORIES:		SALES OFFICES:	
Philadelphia	Los Angeles	Cincinnati	Pittsburgh
Boston	New York	Baltimore	Cleveland
Atlanta		St. Louis	Des Moines

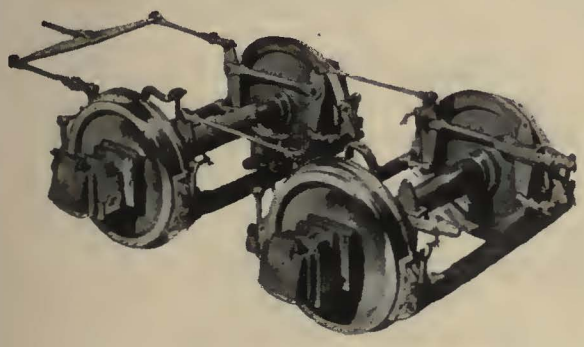
Now is the time to make sure that your fare system is geared up for 1932 operation

LET OUR EXPERIENCE HELP YOU!



Simplex Multiple Unit Clasp Brakes

Speed is today's byword. Greater Speed, faster service, better schedules—these are the demands on practically every transportation organization today.



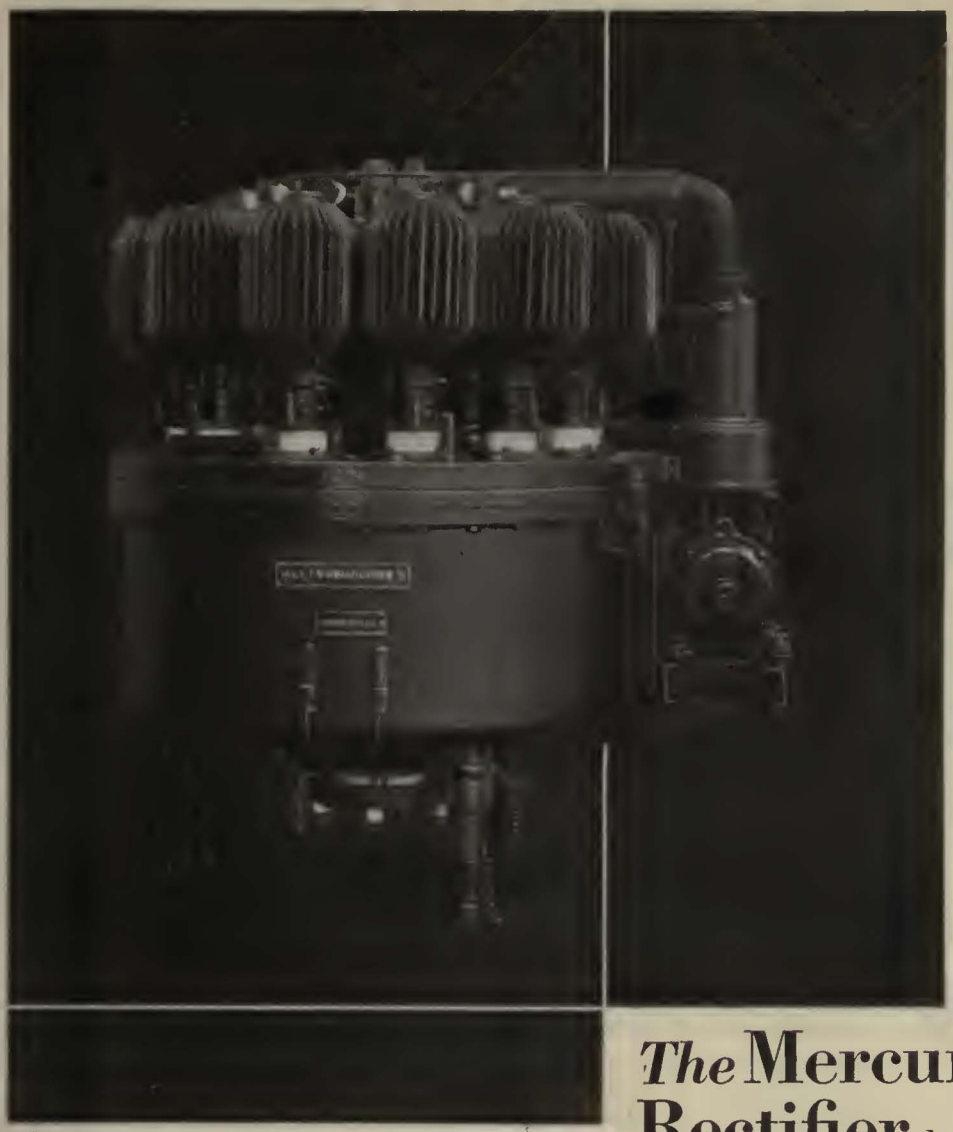
Without a doubt deceleration is as important a factor in maintaining schedules as acceleration or running speed. It's the *most important* factor where speed with safety is concerned.

Simplex Multiple Unit Clasp Brakes offer today's method of braking to meet today's demands in speed. Two brake shoes per wheel *double* the braking area and *halve* the wear on braking equipment.

Balanced braking has *many* advantages. Study the features outlined here. Details and blueprints will be sent at your request.

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS



The first shipment of an Allis - Chalmers Mercury Arc Power Rectifier consisted of a 3,000 kw. unit and was made in 2⅔ months after the rectifier business was acquired. Six other 3,000 kw. rectifier plants are nearing completion.

The Mercury Arc Power Rectifier

business, which was taken over when Allis-Chalmers purchased the principal assets of the American Brown Boveri Co., Inc., of Camden, N. J., has been readily absorbed into the Allis-Chalmers shops at Milwaukee. The key men of the engineering and shop organization from Camden are now fully established at the Milwaukee plant, and the manufacture of Rectifier plants for current orders is in full swing.

Allis-Chalmers Mercury Arc Power Rectifiers are built according to the designs and experience of Brown Boveri & Co., Ltd., and are backed by the organization and resources of Allis-Chalmers.

ALLIS-CHALMERS

ENGINEERS *and* CONSULTANTS

ALBERT S. RICHEY

ELECTRIC RAILWAY ENGINEER

WORCESTER, MASSACHUSETTS

EXAMINATIONS
REPORTS-APPRAISALS-RATES
OPERATION-SERVICE

BYLLESBY ENGINEERING *and* MANAGEMENT CORPORATION

231 S. La Salle Street, Chicago

New York Pittsburgh San Francisco

THE BEELER ORGANIZATION

Engineers and Accountants

JOHN A. BEELER, DIRECTOR

Traffic — Traction
Bus-Equipment
Power-Management
Appraisals Operating and Financial Reports

Current Issue LATE NEWS and FACTS free on request

52 Vanderbilt Avenue, New York

WALTER JACKSON

Consultant on Fares and Motor Buses

The Weekly and Sunday Pass
Differential Fares—Ride Selling

Suite 6-A
616 E. Lincoln Ave., Mt. Vernon, N. Y.

C. B. BUCHANAN, President
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Engineering and Management,
Construction, Financial Reports,
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1004 First National Bank Bldg.

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TRANSPORTATION
UTILITIES

Transit-Traffic Development Surveys, Street Plans, Controls, Speed Signals, Economic Operation, Schedule Analyses, Bus Co-ordination, Rerouting, Budgets, Valuation, Rate Cases and Ordinances.

EXPERIENCE IN 25 CITIES

2301 Connecticut Avenue
Washington, D. C.

R. F. KELKER, JR.

ENGINEER

20 NORTH WACKER DRIVE
CHICAGO

TRANSIT DEVELOPMENT
OPERATING PROBLEMS
TRAFFIC SURVEYS
VALUATIONS

JANUARY ANNUAL STATISTICAL AND PROGRESS NUMBER

Closes December 23rd

Early receipt of copy and plates will enable us to serve you best—to furnish proofs in ample time so changes or corrections may be made if desired.

ELECTRIC RAILWAY JOURNAL

The P. Edward Wish Service

50 Church St., NEW YORK

Street Railway Inspection
DETECTIVES

131 State St., BOSTON

A Personal Want—

can invariably be filled by a friend.

The Searchlight Section

of this issue covers the current business wants of the industries in which this paper is read.

For Every Business Want
"Think SEARCHLIGHT *First"*

A Business Want—

must be satisfied by someone in your industry.

0134

ALPHABETICAL INDEX

This index is published as a convenience to the reader. Every care is taken to make it accurate, but *Electric Railway Journal* assumes no responsibility for errors or omissions.

Searchlight Section—*Classified Advertising*

SEARCHLIGHT SECTION

EMPLOYMENT : BUSINESS : OPPORTUNITIES : EQUIPMENT—USED or SPECIAL

UNDISPLAYED—RATE PER WORD:

Positions Wanted, 5 cents a word, minimum $1.00 an insertion, payable in advance.

Positions Vacant and all other classifications, excepting Equipment, 10 cents a word, minimum charge $2.00.

Proposals, 40 cents a line an insertion.

INFORMATION:

Box Numbers in care of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.

Discount of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

1 inch $6.00
2 to 3 inches..... 5.75 an inch
4 to 7 inches..... 5.50 an inch

Other spaces and contract rates on request.

An advertising inch is measured vertically on one column, 3 columns—30 inches—to a page. R.J.

COPY FOR NEW ADVERTISEMENTS ACCEPTED UNTIL 3 P. M. ON THE 20TH FOR THE ISSUE OUT THE FIRST OF THE FOLLOWING MONTH

DISMANTLING?

Let us handle this for you. We specialize in buying and dismantling entire railroads, street railways, industrial and public service properties which have ceased operation. We furnish expert appraisals on all such properties.

Consult us also about New and Relaying Rails—all weights and sections. You will like our service.

The Perry, Buxton, Doane Company

(Capital $1,000,000.00)

Boston Office, P. O. Box 5253, Boston, Mass.

Pacific Sales Office—Failing Building, Portland, Oregon

FOR SALE

13—High speed **Interurban Passenger Cars**, light weight, complete, approximately 38,000 lbs., equipped with four General Electric 247 Motors, K control, full safety features, single end operation and including magnetic brakes. Cars are three years old, equipped with new Cincinnati type trucks, 28-in. wheels. Free running speed approximately 52 miles per hour, on 650 volts. By changing gear ratio, could be admirably adapted for city service.

4—4-motor **Freight Cars**, each equipped with Westinghouse 557, 150-hp. Motors, HL control, automatic air brakes.

5—300 kw., 33,000/445 volt, 60 cycle, 600 volt, D.C., **Westinghouse Automatic Substation.**

2—500 kw., 33,000/445 volt, 60 cycle, 600 volt, D.C., **Westinghouse Automatic Substations.**

1—500 kw., 33,000/445 volt, 60 cycle, 600 volt, D. C., **Westinghouse Portable Automatic Substations.**

10—**Standard Interurban Box Cars.**

5—**Flat Cars.**

10—**Interurban Stock Cars.**

6—**Buda Section-motor Cars.**

2—**Buda Speeders.**

Miscellaneous lot of Repair Parts, Track and Shop Material, Electrical Equipment, Standard Hardware, etc.

Terms can be arranged.

FS-258, Electric Railway Journal, 520 No. Michigan Ave., Chicago, Ill.

"SEARCHLIGHT" Opportunity Advertising

—to help you get what you want.

—to help you sell what you no longer need.

Take advantage of it—For Every Business Want

"Think SEARCHLIGHT First"

Your OLD *railway equipment means* NEW *business for us*

WE WANT IT

We're ready with cold cash to relieve you of any serviceable electric railway equipment you are not using.

We turn your idle or surplus cars, poles, trackage, power house apparatus, etc., into useful equipment for others.

Send us a list of any equipment you wish to liquidate, and we'll make you an attractive offer.

Are you in the market for relaying rail? We can supply you—at the right price—

GORDON & GERBER

330 THIRD STREET
CHELSEA, MASS.

POSITIONS WANTED

SUPERINTENDENT transportation: Broad experience, successful record, covering every phase of transportation. At present engaged. Salary, location secondary importance, available short notice, fine references, correspondence invisted. PW-261, Electric Railway Journal, 330 W. 42nd St., New York.

YOUNG MAN desires position as assistant engineer for electric traction. Eight years in shops and graduate in electrical engineering. PW-260, Electric Railway Journal, 330 W. 42nd St., New York.

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G-15

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