

ELECTRIC RAILWAY JOURNAL

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APRIL 14, 1928

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Vol. 71
No. 15

April 14, 1928

Pages
605-644

CONTENTS

Modern Equipment Used for Instructing Toronto's Trainmen608

BY W. R. McRAE

A new school room at Toronto has been provided and equipped with modern devices, in order to make it easier to prepare new men for their duties. Old employees have also profited by receiving instruction in this school.

Million-Dollar Rehabilitation at Springfield...613

This Massachusetts property has been modernized by the reconstruction of much of the track and the purchase of new rolling stock, both cars and buses.

Detroit Survey Develops Basic Traffic Data...617

Every phase of passenger and freight transportation and all the elements that make for traffic congestion were taken into consideration in this survey, of which this installment is the second part. Part One appeared in the issue for April 7.

Mercury-Arc Rectifier Substations Used on European Railways.....622

Considerable interest is being shown in Europe in the adoption of mercury rectifiers for substation operation on electrified main lines. This story gives the details of several such installations on the Midi Railway.

* * * * * Editorials605

MARKET ANALYSIS AN IMPORTANT PART OF
MERCHANDISING605

INDETERMINATE FRANCHISE MEASURE A BRIGHT
SPOT IN NEW YORK LEGISLATION.....605

NEW BUS DEAL IN LOUISVILLE.....606

THE BUS IS FINDING ITS ECONOMIC PLACE.....606

SAVING MONEY BY SPENDING IT.....607

EXAGGERATED OPTIMISM MAY DISTURB
BUSINESS STABILITY607

Purchase of Tientsin, China, Street Railway a Problem612

Cincinnati Finds Foremen's Conference Helpful....616

No Change in Chicago Parking Ordinance621

Modern Carhouse at Detroit Completed.....624

Maintenance Methods and Devices.....626

New Equipment Available627

American Association News629

News of the Industry630

A Gracious Recognition of an Ideal

IN THE mail of a publisher there come many comments—some complimentary, some critical. All are helpful. They reflect the readers' reactions to a publication's policies. Like chips on a stream they sometimes indicate eddies and cross-currents of thought that suggest the need for careful soundings and a check of the editorial course.

Rarely, though, does a letter bring a recognition of a paper's ideals so gracious as one which was received during the past week from the president of a large electric railway. Commenting on the JOURNAL's effort to stimulate local transportation progress, he puts into words the editorial ideal that motivates every McGraw-Hill publication—"A trade journal that lives for its industry."

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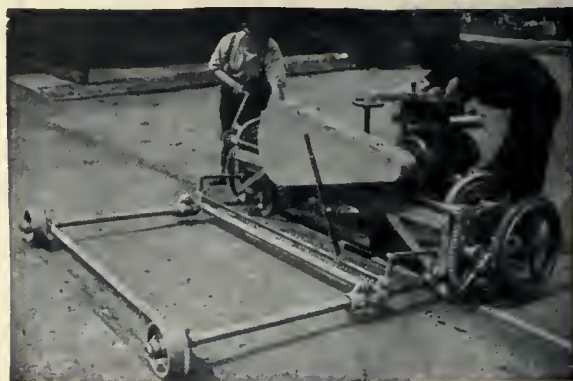
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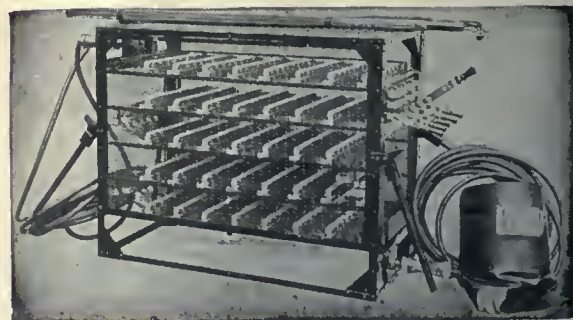
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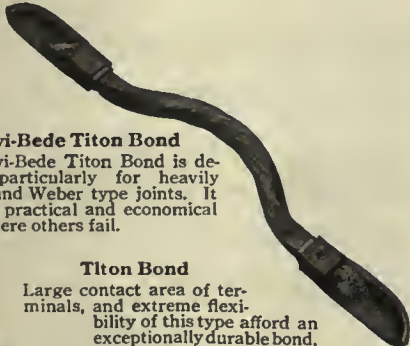
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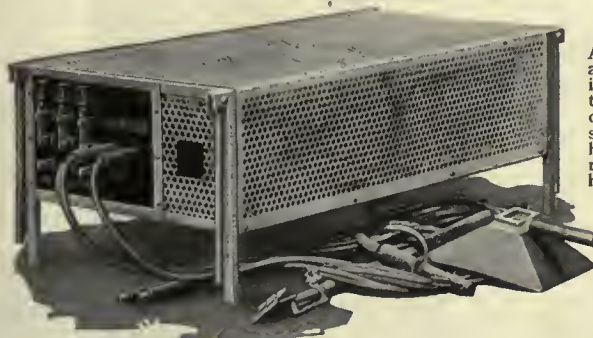


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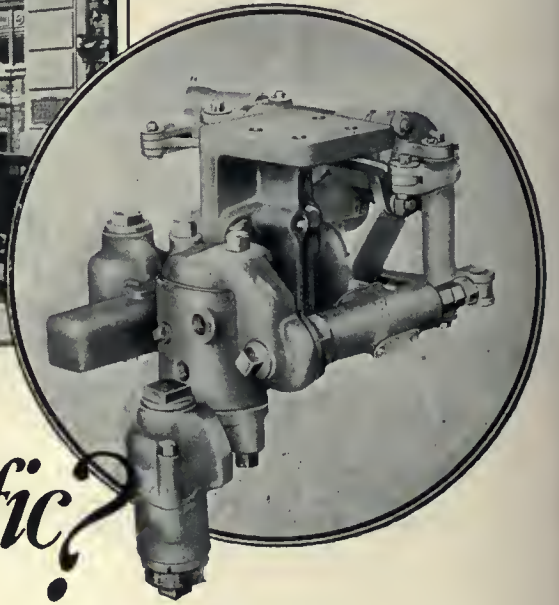
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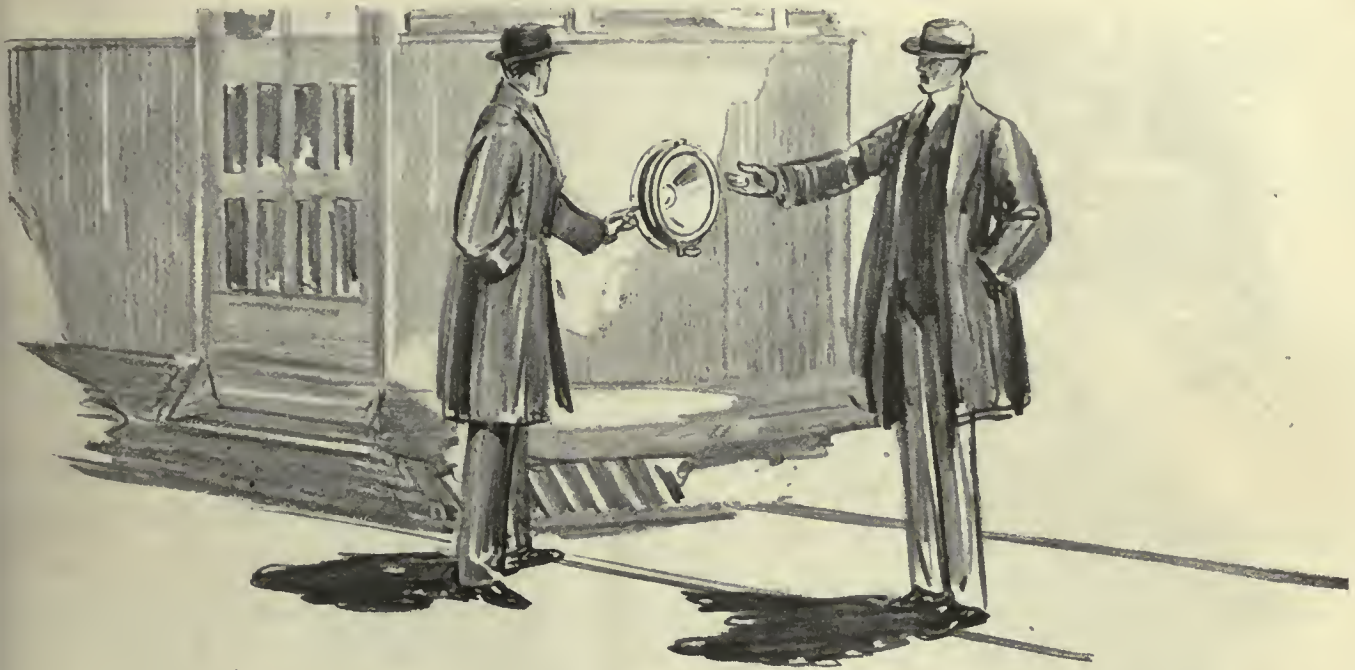
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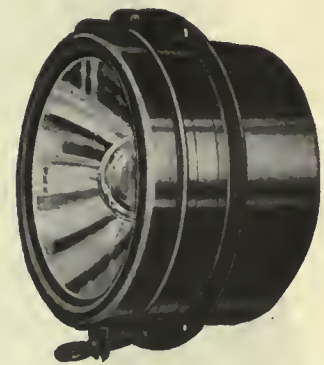
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8

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TODAY



ESTERDAY

- No. 1 Cincinnati
- No. 2 Boston
- No. 3 Detroit
- No. 4 Philadelphia
- No. 5 Kansas City
- No. 6 Cleveland
- No. 7 Washington
- No. 8 Buffalo

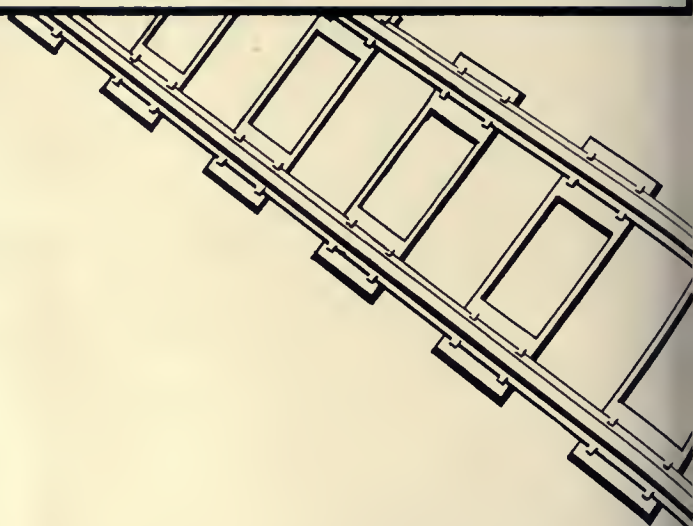
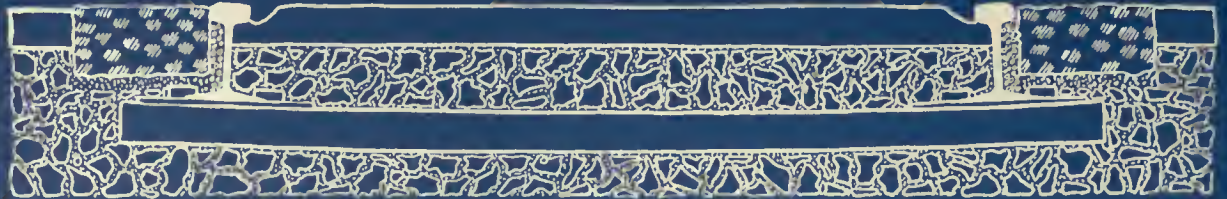


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THE BASE OF MODERNIZATION



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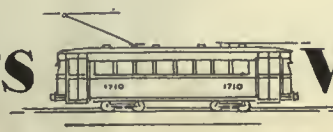


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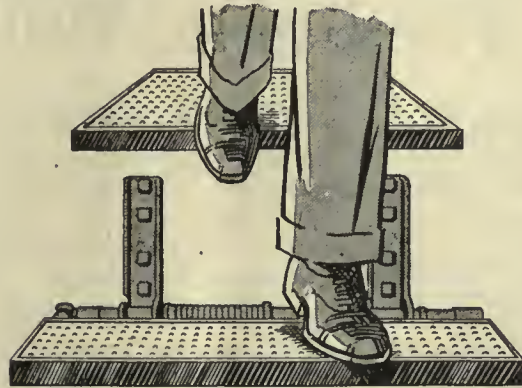
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That spells SAFETY. It means savings through the preventing of accidents.

Cincinnati BALANCED Lightweight cars increase schedule speeds wherever they are in service. They speed schedules and reduce accident figures. "Speed with Safety" helps to make every rider a more frequent rider.

*— still a step ahead
of the modern trend!*

BLEST

GENTS

OMMAND



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Given the choice between comfort and the lack of it, the riding public will buy comfort whenever possible. It is a matter of record that the appearance of Cincinnati BALANCED Lightweight cars bring increased patronage.

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Cincinnati Car Company, Cincinnati, Ohio

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BALANCED
LIGHTWEIGHT

CARS

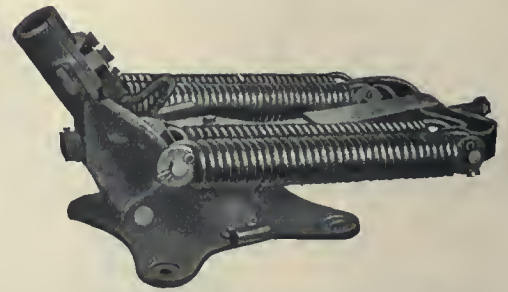
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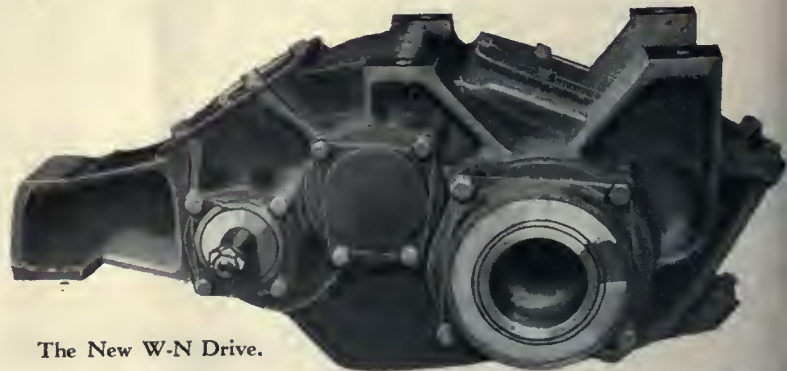


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And think of the reduction in car maintenance this permanently smooth track affords.

Small wonder that sales of Dayton Ties grow almost beyond belief.



The Dayton Mechanical Tie Co.
DAYTON, OHIO



ELECTRIC DRIVE
for
GAS-ELECTRIC BUSES
AND TRUCKS

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.

Popular preference



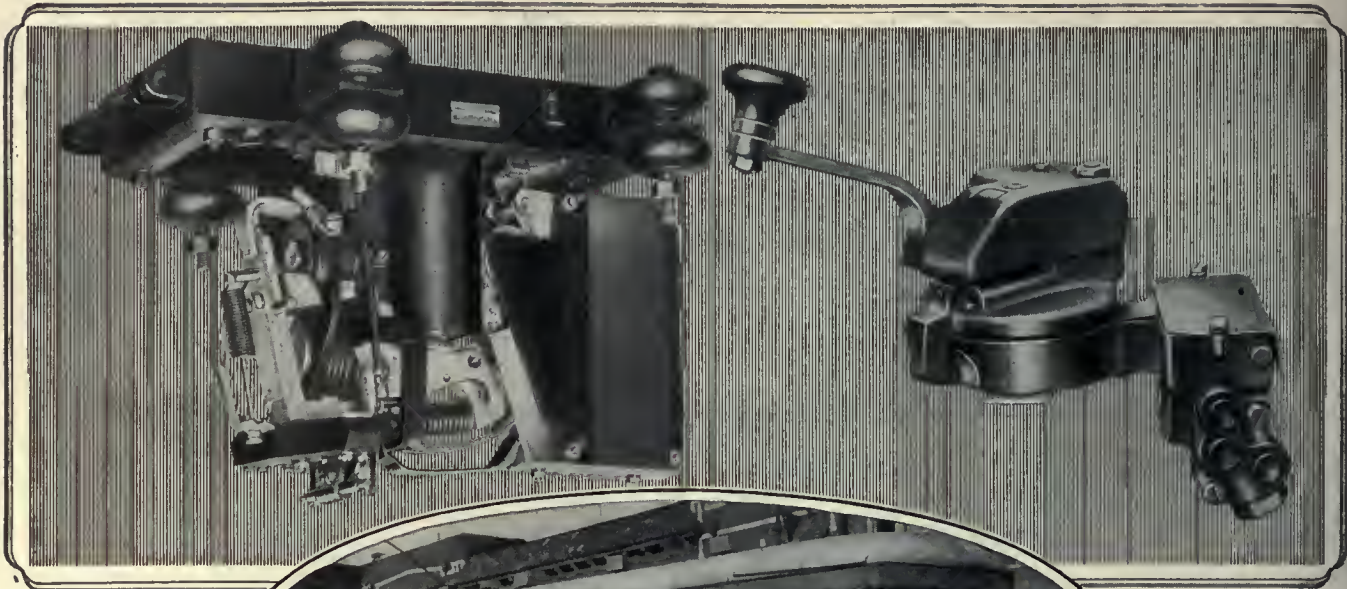
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390-30

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LB-4 Control Device

420 line breakers *for one road*

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330 67

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

Electric Railway Journal

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

Consolidation of
Street Railway Journal and
Electric Railway Review

CHARLES GORDON
Editor

Volume 71

New York, Saturday, April 14, 1928

Number 15

Market Analysis an Important Part of Merchandising

WHILE discussions among electric railway men have for some time included the subject of merchandising transportation there still is a wide gap between the use of the term and its concrete application to the sale of transportation service. This is strikingly evidenced by the lack of definite information regarding the travel habits and preferences of the people in a given community.

In these days of keen competition and consequent need for intensive merchandising activity in the marketing of all classes of products, a market analysis has come to be recognized as one of the first essentials to scientific merchandising. The object of such a study is to acquire information regarding the number, location and buying habits of potential customers, and to determine the character of products and the nature of the appeals that may be expected to prove attractive to them.

Obviously, since this interest in the possibilities of merchandising transportation is of comparatively recent origin, "market analysis" is a strange term in the vocabulary of the electric railway industry. Nevertheless, it is highly important that transportation men understand the travel habits of those who do not use the street car or bus, so that they can study and learn the reasons why other modes of travel are being used and take steps to secure as much of this business as possible. Considerable interest, therefore, attaches to the survey of the riding habits of more than 100,000 persons in Detroit, made incident to the traffic survey in that city and discussed in the concluding article on this survey, published in this issue.

Questionnaires collected in eleven employment districts gave the place of employment, place of residence, mode of transportation used and reason, time required in traveling from home to work, and the number of blocks walked to and from mass transportation vehicles, if such were used. All of this information was classified for each of the eleven employment districts. It was classified, also, for 155 arbitrary residential sections and a chart was prepared showing how many of the total number tallied lived in each section, and the number using each type of transportation.

The charts prepared from the survey give a wealth of merchandising information. They show wide variations in the travel habits of the people in the several districts and illustrate the kind of market data that is needed to work out a really comprehensive transportation merchandising program. By using the information on the charts to check the actual transportation facilities provided, there is the opportunity for making service changes that will win increased patronage from those who for several reasons may be using other means of travel. The extent of this use of other agencies represents the

"unsold" market for public transportation. In sections where automobiles are used extensively increased speed and more attractive equipment may be the appeal needed to win riders. Where walking is the chief competitor, reduced headways and special fare concessions for short distances may prove effective. In each instance there is the opportunity for adjusting service to the requirements of a given section. After that, local advertising or selling effort may be directed toward the prospective riders on each transportation line, rather than dissipated in general appeals to an entire community.

The Detroit survey was made to determine the general causes of traffic congestion, and this analysis of travel habits was incident to that general objective. There was apparently no thought of a transportation "market analysis" in the minds of those in charge of the survey. But the information obtained and the way in which it was compiled illustrate rather strikingly the opportunity which exists for public transportation companies to apply scientific marketing methods to the problem of merchandising transportation service.

Indeterminate Franchise Measure a Bright Spot in New York Legislation

GOVERNOR SMITH was right, in the main, when he said that the session of the New York Legislature which drew to a close recently was the least fruitful one he had witnessed in 25 years. Out of the ruck, however, there did emerge some railway measures that may have an important bearing, particularly on the situation in New York City. Among them are the so-called Thayer bills. These companion measures amend the transportation corporation law and the railroad law by providing for terminable permits for stage, omnibus and motor vehicle lines and for street surface railroads. Under them a municipality would have the right to acquire by purchase all or any part of the property, plant and equipment of a stage, omnibus, or motor vehicle line, or of a street railway. Subject to the approval of the Public Service Commission or the Transit Commission, cities are empowered to grant terminable permits to operate stage, omnibus or motor vehicle lines, or street railway lines.

The prediction was borne out that the bill designed to extend relief to railways in paying for paving would fail of passage. A law was passed, however, giving the city of Ogdensburg the right to compromise its paving claim with the Ogdensburg Street Railway. Despite the passage of the so-called Mastick bill, intended to confer upon the Port Authority the power to deal with a comprehensive suburban transit plan, the Governor vetoed that measure.

The bills intended to further the railway unification plan of the city of New York were lost. One of these measures was drafted at the behest of the Transit Commission, presumably as a part of its work in carrying

out the Legislature's own mandate to it to prepare a plan for transit readjustment. The bill was iniquitous in that in reality it provided for a 5-cent fare perpetually, under the guise of authorizing the Board of Estimate and Apportionment of New York to appropriate funds and issue certificates of indebtedness to make up any deficit incurred.

Naturally, there has been some recrimination in New York City at the failure of the so-called city bills to pass. Samuel Untermyer, special counsel to the Transit Commission, deplors the failure of these measures, but Mayor Walker pretends not to be specially concerned about them since three or four more years must elapse before the system of rapid transit lines now under construction by the city and intended to be operated by the municipality will be ready to be put into service.

Apparently the Legislature was more alert than might at first be suspected, for, under the attractive bait of transit unification in New York, was poorly hidden another attempt to get rid of the fare requirement of the present law under which the city's municipal subway is being constructed. It will be remembered that the rate of fare on the municipal subway must after three years of operation be put at a figure sufficient to make the system self-supporting. A municipal system charging an 8 or 10-cent fare while privately operated companies are held to 5 cents, would have only one ultimate result—complete collapse of the city's untenable and ridiculous fare policy. Therefore the city administration made what appeared to be a somewhat casual effort to get rid of the requirement in the law which promises to become increasingly embarrassing as the municipal subway approaches completion. As long as the law remains as it is at present, continued effort may be expected to include the new municipal subway in some form of rapid transit consolidation. Any really sound plan must provide an adequate rate of fare. Since that is desirable from the standpoint of efficient transportation it is a good thing for the people of New York that the Legislature refused to "bite" on Mr. Untermyer's bait.

A New Bus Deal in Louisville

REAL co-ordination of the transportation services in Louisville is now assured. The Council has passed and the Louisville Railway has purchased a bus franchise that makes for co-operation not possible in the past. The grant is for twenty years. The provisions are published elsewhere in this issue. Like the railway franchise the new grant calls for the operation of the buses under the service-at-cost plan. This plan naturally possesses marked advantages where the matter of designating the amount and kind of service that are to be given is vested in the city.

The company at present has 30 buses available for use in a service which as now proposed contemplates the use of only 21 vehicles. It is to be expected, however, that this service will be augmented from time to time, particularly since Louisville has grown rapidly in recent years. Service somewhat similar to that now contemplated in the new grant has been given by the company in the past, but was largely the successor to that furnished by the original jitneys. The previous efforts of the company were hampered by the limitations under which it was permitted to function. It would appear now that all the previous handicaps have been removed.

That, of course, is a good thing for the railway, but it is a particularly good thing for the city since it insures operation by a responsible public servant capable under the principle of co-ordination and service-at-cost of functioning under proper supervision to the best advantage of the public. In short, the city has enrolled its name along with those other progressive municipalities in the United States which have recognized that transportation, properly supervised by governmental agencies, is a natural monopoly.

The Bus Is Finding Its Economic Place

APPLICATION of the Kansas City Public Service Company for a 15-cent bus fare raises anew the question of the economic place of the bus in city service. That there is a place—and a large one—for the automotive vehicle is today beyond question. But that place stands out with increasing clearness as one in which there must be an entirely different conception of service standards and rates of fare than exist for street cars. The bus is dependent for its major development upon assuming its place as a transportation agency in its own right and not as a mere substitute for existing services.

The bus-rail problem by no means stands alone in the history of transportation. When the railroads began to throw their steel bands across valley and mountain, the river barge was doomed to oblivion in the minds of many. Nevertheless the lower Mississippi last year carried the largest freight tonnage in its history. When the automotive triumvirate—the automobile, the truck and the tractor—began to change the habits of a nation, old Dobbin seemed destined for the glue factory. Yet hay is still an important farm product and harness makers don't complain for lack of business. It is one of the characteristics of transportation that demand increases with increased facilities, speed, convenience and comfort.

At present there is a wide gap between the cost, the convenience and the attractiveness of an automobile, and a transportation ride in the basic low-priced agency—the street car. Between these two limits there is a broad field into which the bus fits due to its inherent advantages. By giving a service at rates varying from 4 to 5 cents a mile, it becomes possible to offer convenience, attractiveness and comfort in city service at a price which can compete favorably with the private car or taxicab and which at the same time offers an attractive margin of profit. As parking difficulties and traffic congestion become more acute, the attractiveness of such service by buses is increased.

All this is not to say that there is no place for the bus in service of the feeder or supplementary type at rates of fare approximating street car rates, where the density of traffic does not justify the investment in rails. Under such conditions the rubber-tired vehicle offers an excellent expedient for reducing the losses that would be entailed in giving car service. But as experience with the bus increases it becomes clear that it is a mistake to establish bus operation on a large scale at rates which do not permit it to render the preferred class of service for which it is inherently fitted. Farsighted bus manufacturers today are devoting their attention to the economics of bus operation in a way which promises rapid expansion in the use of the new vehicle. They are concentrating upon the application of their vehicles in services

which will prove really profitable to the operator. In that objective they still encounter the competition of the salesman who has not yet learned that low fares, once established, are difficult to raise and that an unprofitable operation does not produce repeat customers.

The Kansas City move for a 15-cent fare directs attention again to the Pittsburgh operations in which a preferred form of transportation with buses was initially established at 25 cents and has since been expanded rapidly and profitably. The character of service offered attracts a very considerable number of riders who formerly operated their private cars regularly. The secret of the success achieved seems to lie in the fact that the character of the operation and the rate of fare charged have been properly balanced to give a service which is really attractive and self-supporting.

Saving Money by Spending It

SEVERAL interesting features are involved in the recently opened carhouse and storage yard of the Detroit Department of Street Railways on Coolidge Highway. According to an article elsewhere in this issue, the management estimates that savings approximating \$500,000 a year will be effected. That is a large sum, even for a system the size of Detroit's. An analysis of the reasons for it is of interest.

The major part of the saving comes from a reassignment of the cars of the Grand River Avenue line. Since the Jefferson Avenue cars have been running express the former through-routing of the two lines has been discontinued. It is estimated that assignment of the Grand River Avenue cars to the new station will effect a saving of \$225,000 annually through the elimination of waste car-miles. Other savings come from the arrangement of the storage tracks so that rotary movement of all cars can be obtained, reducing waste time for backing the cars out, and through the use of a portion of the property for storage of track and paving materials for distribution to locations on the west side of the city as needed.

One of the noteworthy items in connection with the selection of the site is that there has been an increase in realty values in the neighborhood. Years ago the erection of a carhouse depreciated the adjacent property materially. One reason for the difference here is that the railway management has followed the plan adopted by many theaters, hotels, and other business concerns which need entrances only on the main thoroughfare. The space reserved for the railway has only sufficient street frontage to provide entrances for the cars and space for the inspection building. The remainder of the property used for open storage of cars is at some distance back from the street, leaving the portion in front vacant. The department plans to resell a frontage of 663 ft. along Coolidge Highway, and it believes that the amount that can be realized will be nearly equivalent to that paid for the entire plot.

By attention to the details it thus has been possible to plan new facilities so that they do not add anything to the cost of the property. If the savings estimated are realized, the entire cost of land and building will be returned in less than one year. It takes relatively few projects such as this to spell the difference between success and failure in these days when the margin of profit is small.

Exaggerated Optimism May Disturb Business Stability

FUNDAMENTALLY, business conditions are sound. But the present industrial world has undergone a readjustment in recent years the portent of which is disconcerting in its magnitude. In an article on page 602 of last week's issue of the JOURNAL, Julius Klein, director of the Bureau of Foreign and Domestic Commerce, cites the fact that the mechanization of industry and war deflation has reduced the number of factory employees in the United States 917,000 since 1920. Added to this are decreases of 800,000 employees in agriculture and 240,000 on the railroads, making a total of approximately 2,000,000.

This trend has been quite apparent and has been widely discussed for several years. Not so widely recognized, however, has been the balancing effect of the rapid increases in non-manufacturing or service occupations cited by Dr. Klein. Automobile distribution and service, insurance, domestic appliances, education, motion pictures, barbers, hotels and restaurants have shown large increases in number of employees engaged. Thus the increased standard of living that has resulted from productive efficiency seems to be producing in considerable measure the demand for labor needed to balance the replacement of factory employees.

As Dr. Klein points out further, the first and indispensable safeguard of prosperity is to minimize waste, to concentrate every possible individual exertion toward widening the present rather narrow margin of profit by cutting in on production cost on the one hand and the expenses of distribution on the other. This advice is particularly significant since at this time the margin of profit in nearly every line of business shows unmistakable signs of growing narrower.

Closely related to business, of course, is the security market. There is always danger when the income return from stock investments crosses on its downward path the curve of the return from bonds. That point was reached long since. As that conservative commentator the *Financial Chronicle* says, prices on the Stock Exchange are being boosted with a rapidity and daring that is perfectly dazzling. Eventually securities must reach a level more nearly in line with their intrinsic worth, and that intrinsic worth is inexorably fixed by earning power. If the inevitable deflation of security prices is orderly, there may be no very grave consequences, but if the downward trend that follows is subject to anything like the violent gyrations of the upward movement, the consequences may be far reaching in their general effect.

Apparently, the country has been able to absorb some very heavy shocks. It would seem on the surface that there has been no other consequence than the rocking of the boat as a result of the Florida hurricane, the Mississippi Valley flood, the Ford suspension and the Presidential year unsettlements, but that is by no means certain. Again let it be said that business is sound, but it will remain so only as the responsible men in industry bend every effort to keep it so. And that presumes that they shall do everything within their power to discourage exaggerated optimism. Unbridled speculation in securities is a threat to stability. Wall Street is no less subject to abuse as a market than are other markets. It is in the abuse of the security market that the most immediate danger to industry seems to lie at this moment. Business prosperity is not helped by the hysteria of the gambler.

Modern Equipment Used for Instructing Toronto's Trainmen

This school has been provided to make the work of preparing new men for their duties easy. Old employees also attend the school and learn methods for doing their work better

By *W. R. McRae*

Superintendent of Rolling Stock and Shops
Toronto Transportation Commission, Toronto, Canada



Fig. 1—Platform showing standard car equipment

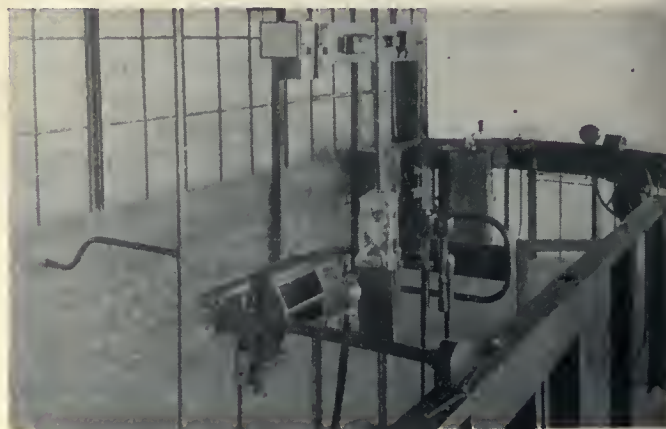


Fig. 2—Near view of equipment shown in Fig. 1

WHEN the city of Toronto took over the street railway from the Toronto Railway in 1921, and put responsibility of operation upon the Toronto Transportation Commission, the building used for the activities of the school of instruction was found unsuitable in many ways, and this important section, which has such a huge bearing on the success or failure of street railway operation, has for some time been located in suitable quarters.

The new premises, situated adjacent to the Hillcrest shops, which are centrally located, are thus convenient of access to employees from all carhouses.

In addition to the standard training of new platform employees the school of instruction is extending its usefulness to all employees, regardless of length of service or department.

Platform men of 20 or 30 years standing are making voluntary visits with a view to learning all they can of the equipment in use and a desire to clear up doubts regarding certain points. To date more than 60 per cent of the platform men (about 1,200) have visited the school of instruction, heard the lecture, and have had demonstrated to them the various pieces of equipment with which their work brings them in contact.

The benefits to be derived from a visit to the school appeal not only to platform men. Shed employees have attended in good numbers, and the clerical staff which deals with the correspondence, accidents, equipment, re-

ports, etc., has also attended lectures and gained knowledge which enables it to carry out duties more efficiently.

The school of instruction is in charge of Chief Instructor Grant, who is assisted by six instructors. A better understanding of the school may be obtained by reference to the illustrations, which show the equipment in considerable detail. The following paragraphs give a brief explanation of this apparatus:

An important piece of equipment is a raised platform, Fig. 1 and Fig. 2, at one end of which is mounted in relative position the equipment as in the vestibule of a standard Peter Witt car. Near the middle is located a conductor's stand as in a three-door trailer. This layout was chosen because in addition to having the usual equipment of farebox, change counter, door control levers, signal lights, etc., it also has the movable barrier which permits of using the middle door as either entrance or exit. This unit is not a "live" one, but is used to familiarize the student with the appearance and location of the various pieces of the equipment. It also teaches him the purely mechanical movements necessary in handling the controller, motorman's brake valve, etc. The movable barriers used to represent doors are provided with switches in circuit with the control switch and motorman's signal lights so that the door interlocking features may be demonstrated. A supply of compressed air permits gage indications to be shown.

At the rear end of this platform, Fig. 3, is a struc-

ture on which is mounted a Tomlinson coupler, with a drum switch and air cocks. A second Tomlinson coupler makes it possible to demonstrate how the cars, air lines and electrical circuits are connected and disconnected.

Those cars not equipped for train operation are not fitted with Tomlinson couplers, an adapter being used in order to couple the standard Victor drawbar to the Tomlinson coupler. The Victor drawbar head and the adapter are shown in the foreground of Fig. 3. Their use is illustrated in Fig. 4.

Figs. 5 and 6 show the side and end views respectively of a platform upon which is mounted a complete equipment of safety devices, including a treadle-operated exit door. The controller, motorman's valve, etc., are arranged so that the operator faces the equipment and can see the action of the brake cylinder, line switch, treadle door and sanders. For this last a board is provided with a pointer showing sand "on" and "off."



Fig. 3—Demonstration equipment for coupling cars

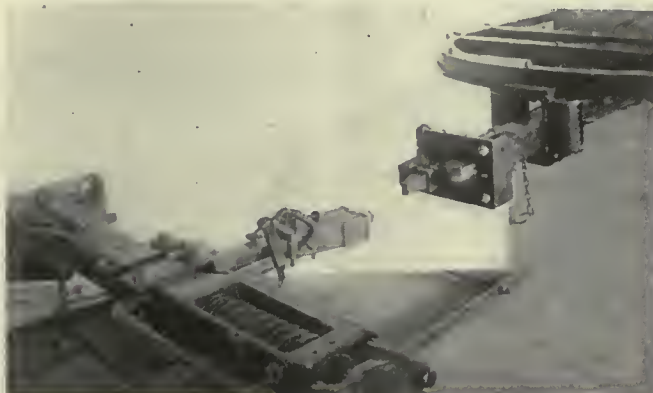


Fig. 4—Use of adapter for connecting automatic and non-automatic couplers

A white lamp, located at the line switch, lights when the switch closes, and a red lamp at the brake cylinder lights when the piston moves out. Both lamps are in line with the operator's eye and serve to impress upon him that when an emergency application of the brake is made from the controller handle, the power is cut off and the brakes applied as well.

Midway on this platform is a unit representing a section of the side of a car with which is mounted a Peter Smith hot air heater with the intake exposed, and a short section of air duct showing how fresh air is drawn from outside and circulated through the car after heating. A standard ventilator is fitted to the roof section and appropriate notices

give details of the amount of fresh air handled by each.

One of the simplest but most useful pieces of equipment of the school is shown in Fig. 7. This is a board on which are painted some simple circuits. The upper diagram of the control circuit through the door interlock

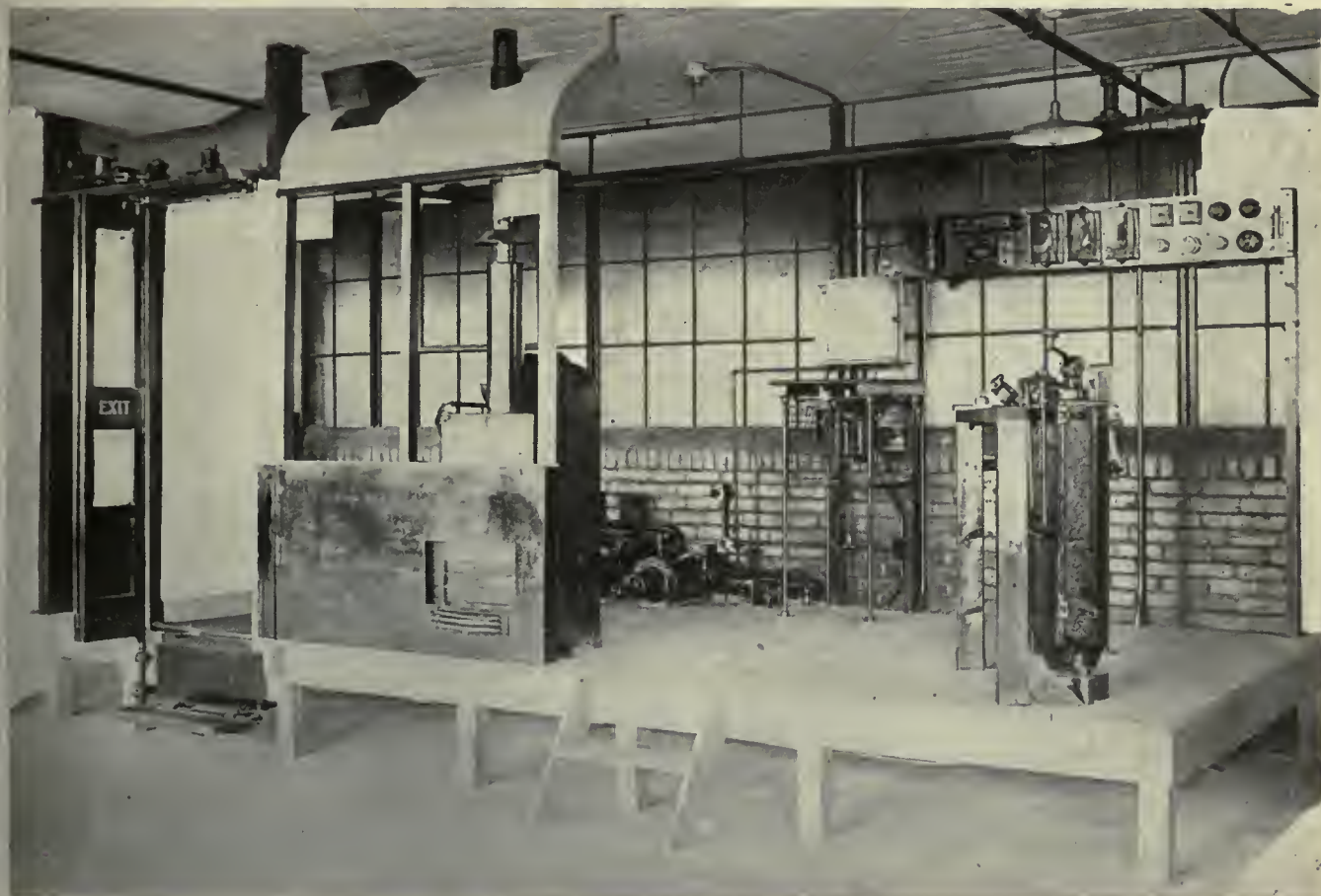


Fig. 5—Platform equipped with full set of safety devices



Fig. 6—End view of the safety device exhibit shown in Fig. 5

switches, etc., illustrates clearly by means of a small wooden bar, which represents the blade of the emergency switch, how, in the event of a failure, the coupler, door switches, etc., can be cut out and a separate feed from trolley secured in order to keep the car moving. The two lower diagrams to the left show the series-parallel arrangement of the motors, and by means of movable dummy switches the action when the controller cutout switches are used is illustrated. At the lower right-hand side is a standard diagram of the various car circuits.

Fig. 8 shows the demonstration board on which the more common failures of the electrical equipment are illustrated, with instructions as to the proper steps to take to get the car moving. On this board are mounted four electric fans and four small lamps, representing the armatures and fields, respectively, of four motors. A number of lamps to represent the rheostat and a line switch are also installed. The board is appropriately painted to show the conduits and wiring to the motors and rheostat; the whole is regulated by a K-6 controller, together with the necessary control switch fuses, etc. Concealed snap switches are mounted behind the board

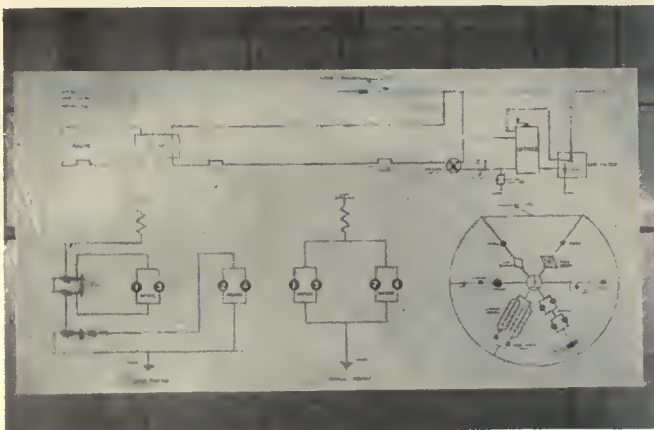


Fig. 7—Simple circuits of motors and equipment of a modern car

with the stems projecting through to the front. Small pointers fastened to these stems under the buttons are painted in uniformity with the lines representing the wires.

The student comes to this board from the one previously described, and is, therefore, familiar with the series-parallel arrangement of the motors. Here he is shown normal operation first. After closing the control switch and getting signal lights, the controller is put on

the first notch and the line switch is seen to close. The whole rheostat is shown in circuit, and the four motors start slowly. In a similar way all the steps to the full parallel position are illustrated.

For demonstrating defects, two of the concealed switches are used to illustrate open motor leads. Two show grounded motors, two more show defects in the rheostats—one a ground, the other a broken grid. Open leads are demonstrated by turning the switch pointer through 90 deg. showing a break in the painted line representing the wire. As the controller is notched up



Fig. 8—Demonstration of common failures of electrical car equipment

the second motor of the pair with a broken lead is seen to spin very fast, while the other two motors run comparatively slowly.

Grounds are illustrated by turning the pointer to register with a ground wire painted on the board, and the student is instructed that the current, instead of following its normal path through the motor, takes the easier path to ground through the defective insulation at the point illustrated. Two concealed snap switches behind the switchboard to the left, for the instructor's use, illustrate how the line switch will open when a ground has occurred, one for the series notches and the other for the parallel. For example, with a ground in No. 1 motor, the instructor turns the first concealed switch as well as the pointer illustrating the ground. On turning the controller handle the line switch closes and the rheostat is shown alive, but due to the ground there is no movement of the motors. Advancing the K-6 controller to third position results in the line switch opening. The student is then shown how to cut out the defective motor.

The armature shown in Fig. 9 is used to let the student see what damage may result from improper handling of



Fig. 9—Armature used to illustrate damage from improper handling. In the rear is a complete lifeguard

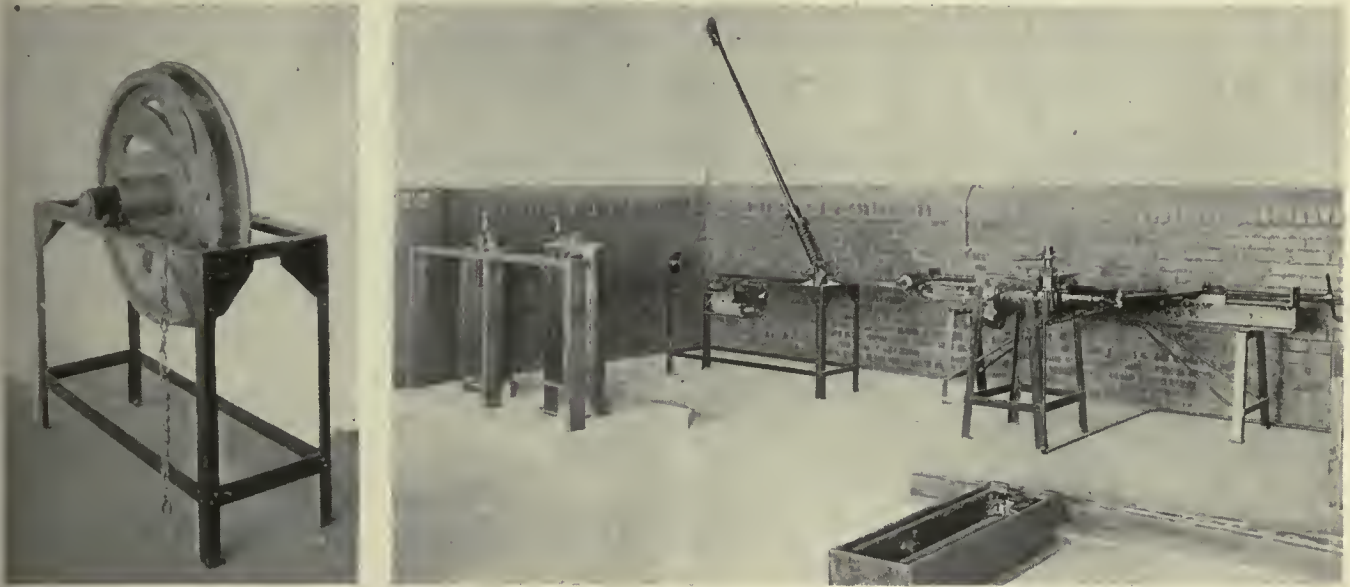


Fig. 10 (at left)—A flat wheel is shown, together with a chain removed from the track groove. Fig. 11 (at right)—Models of an electric track switch, various controllers, trolley pole, catcher, fuse box and rheostat

the car or failure to cut out a defective motor. The instructor adds a few words relative to the expenses incurred and loss of revenue incidental to failures of this kind. An H-B lifeguard is also seen in this view. It is mounted so that all parts are clearly visible and its working can be explained easily.

A cast-iron wheel with a flat spot is shown in Fig. 10. The instructor remarks on the cost of flat wheels and their prevention. The piece of chain hanging on the stand is a sample of the material which finds its way into the groove of the rail, doing a great deal of damage to wheel flanges if not removed promptly.

Of the four units shown in Fig. 11 one is a model of the electric track switch which is standard on this system and is used to demonstrate how in the event of the switch failing to work a link may be removed allowing the tongue to move independently of the actuating mecha-

nism. This link in the model is painted red. Another is a stand on which are mounted a K-10 and an English Electric Company Q-2 controller. In the corner is a stand on which are mounted a trolley pole and base with rope and catcher, a trolley fuse box and a section of rheostat. The last is a set-up to which a supply of air is connected, which is used to demonstrate the working of the automatic brake slack adjuster. A white mark painted on the piston sleeve indicates standard piston travel. Then some slack is introduced in the system and the action of the adjuster noted.

Fig. 12 shows the seating plan in the class room. In this room are the standard schedule and notice cases and a section of a "signing in" desk, all as used in the various carhouses of the system. On the walls are frames containing sample transfers, badges, etc., together with a large map of the city.



Fig. 12—Seating arrangement in the class room

Purchase of Tientsin, China, Street Railway a Problem

Chihli state government, while contemplating the purchase of the system, objects to the railway company's sale price

By H. O. KUNG

Secretary the Chinese Engineering Society
American Section

PURCHASE of the street railway system in the city of Tientsin, the "Chicago" of China, is proving a difficult problem for the Chihli state government. The present company operating the street railway system demands a price fifteen times the average annual profit of the three preceding years, which the government is unwilling to pay.

The provisions of the franchise concerning distribution of profits and the purchase of the system by the government are peculiar. The purchase terms involve the profit earned by the company, and the profit to be retained by the operators, in turn, is determined by investment. Since the owners have never disclosed the true investment figures, the government officials are unable to arrive at a correct purchase price. The whole problem has now resolved itself into evaluating the street railway properties.

The city of Tientsin, the great trade center of north China, is about 80 miles southeast of Peking, the capital of the Chinese Republic. A few generations ago Tientsin was a very small town, but now it has a population of more than 900,000. Of this number 1 per cent are foreigners, most of whom are engaged in trading, either importing or exporting. All the street construction and trade buildings are modern, except those within the former city walls. Tientsin resembles in many respects the American cities of Cincinnati, Ohio, and Pittsburgh, Pa.

FRANCHISE OUTLINES DETAILED METHOD OF DISTRIBUTING PROFITS

The street railway was constructed in 1904 by a Belgian trade company, which also installed the power and light distribution system for the city. The nominal capital has been given as \$1,000,000, but the actual investment of the company is unknown to the state government officials. The company paid \$5,500 to the Chihli government for the issue of a franchise for a period of 50 years. A detailed system of distributing profits was outlined in the franchise tendered the railway, as follows: The company shall contribute each year to the Chihli government a sum which shall be $3\frac{1}{2}$ per cent of the gross revenue and may earn a legal profit of 12 per cent on the investment. If any profit should remain after deducting for expenses and maintenance, 12 per cent of the amount shall be contributed to the government as royalty. Dividends on the stock may then be paid up to 15 per cent of par. Should any balance remain undivided after paying the 15 per cent dividends, 20 per cent of this remainder shall be paid the government and 20 per cent retained by the company as surplus.

According to the general contract, the Chihli government may purchase the properties of the operating company after the first twenty years of service at a price which shall be fifteen times the average annual profit of the three immediately preceding years. In no case shall the price be less than all the expenses for con-

struction and installation of the entire system, including buildings, trolleys, tracks, machinery and equipment. Should the Chihli government not purchase the properties of the operating company at the end of the first twenty years, a seven-year extension service shall be allowed to the same company. After 50 years of service however, all the property shall be transferred to the government free of charge and in good condition.

It is obvious that the operating company would hold a decided advantage should the Chihli government decide to purchase the road at the end of the 49-year period. However, should the government await the termination of the 50-year period, the tables would be turned. The general contract was signed on April 26,

GROSS REVENUE, EXPENSES AND PROFIT FOR 1922, 1923 AND 1924

Year	Gross Revenue			Expenses	Profit
	Street Railway	Lighting	Total		
1922.....	\$845,529	\$1,387,519	\$2,233,048	\$775,399	\$1,457,649
1923.....	854,075	1,586,397	2,440,472	749,974	1,690,498
1924.....	872,308	1,766,176	2,638,484	784,325	1,854,159

1904, and the franchise for furnishing electric energy and street car services will be legally terminated in 1954. The seventh elapsed period would terminate in 1953.

The financial conditions of the operating company for a few years past are extremely interesting. The gross revenue, expenses and profits for the year 1922, 1923 and 1924 are shown in an accompanying table. The average annual profit for this period was \$1,667,435, so that the purchase price, figured according to the terms of the contract, would be \$25,011,525. It is quite natural that there should be disagreement between the company and the government over the "fifteen times yearly profit" clause.

The general contract provides that the Chihli government may acquire control of the company's property if it can be found that the company has earned any illegal compensation. As a result of several months investigation conducted by a special committee, the operating company has been found to have earned illegal profits. On the basis of this discovery, the government assumed control of the property in August, 1927, and demanded a purchase price to be set by the company. The company complied with the request and in a note sent to the government claimed \$26,305,395 as the purchase price of the entire property. This amount the government has refused to pay. Because the purchase price is determined from the average annual profits over a three-year period, and since the amount of profit to be retained by the company is determined by the actual investment in the property, there has been a further dispute over the actual amount invested in the property. The government has set about to determine a reasonable valuation from which it can establish a true purchase price.

To arrive at such a reasonable valuation the following three elements should be considered and given their proper relative weight in determining the final price: First, the actual and historical investment of the company should be disclosed to the appraisal engineers; second, the market value and the amount of the outstanding stocks and bonds also should be disclosed; third, a brief but complete financial statement of the company for each year, from the first year of operation to the present, should be presented. Based upon these three elements in applying the equal profit ratio depreciation method a just valuation of the company's properties may be determined.



One of the 50 light-weight city cars bought by the Springfield Street Railway last year

Million Dollar Rehabilitation *at Springfield*

Purchase of new cars and new buses, extensive track reconstruction, and increase in shop and garage facilities are among the improvements made during the past year. Further track reconstruction planned for coming season

MORE than a million dollars was spent by the Springfield Street Railway, Springfield, Mass., in the improvement and rehabilitation of its property during 1927. This was one of the first big steps in the plan of the New York, New Haven & Hartford Railroad to modernize the street railways which it controls. The rehabilitation was not undertaken from altruistic motives, but for fundamental economic reasons. Investigation convinced the management of the New Haven that the street railway is now, and will remain for a long while to come, the backbone of the local transportation service in Springfield. The officials of the railroad believe that transportation, like any other commodity, cannot be produced economically with obsolete equipment. Furthermore, it is their belief that transportation service should be made attractive. You cannot sell a man what he does not want. With these thoughts in mind, an extensive program of improvements was undertaken. Some of them have already been carried out, and others will be made during the present year.

Approximately \$800,000 was spent last year for 50 new light-weight city cars. Before the purchase of these cars the company had been engaged in the development of an experimental car in collaboration with the Wason Manufacturing Company. This experiment was one of the outstanding developments in the electric railway industry last year. So many radical features were included

in this new design, however, that it was considered undesirable to adopt it for a large order of cars before these new departures had been thoroughly tried out in actual service. The lot of 50 cars bought last year, therefore, were designed along more conventional lines. They were described in detail in *ELECTRIC RAILWAY JOURNAL* for March 26, 1927.

The company also bought nine new buses last year. Of these three were 29-passenger Yellow coaches model Z. Six were Macks of the same seating capacity. All the new buses are being used on city routes in Springfield, taking the places of older buses which have been transferred to lighter traffic routes in outlying districts. In all, the Springfield Street Railway is now operating 41 motor coaches. The former freight station has been converted into a garage. Owing to the discontinuance of through electric railway operation between Worcester and Springfield, freight service had been abandoned and the former freight station became available for other uses.

More than \$300,000 was spent for track improvement last year. The program was planned after a careful survey of the property had been made to determine what reconstruction work was needed. On account of increasing traffic and to speed up the service a considerable amount of double-tracking was undertaken. In all 1.78 miles of new track was added to the system and 6.07

Job No.	Location	Work Done	Distance Ft.	Date Built	SUMMARY OF TRACK WORK		
					Rail	Old Construction Ballast	Paving
1	Belmont Ave., X to E. Longmeadow line	Replacing single track with double track	5,000	1896-1901	7-in., 70-lb. T	None	Bituminous
2	Sumner Ave., Lenox St. to Lyndale St. Double-track crossing at X.	Replacing single track with double track D.T. crossing, two branch-offs, three cross-overs.	2,500	1896-1901	7-in., 70-lb. T	None	Bituminous
3	State Street, Oak to Hancock	Reconstruction of double track	1,200	1910	9-in., 125-lb. girder	Sand on 6-in. con.	Wood block
4	State Street, Benton to Pine Point	Reconstruction and raising grade of double track 3 in.	4,200	1902	9-in., 107-lb. girder	Dirt	Hassam
5	Berkshire Street, West from Page Blvd.	Reconstruction of outbound track	2,700	1902	7-in., 70-lb. T	Gravel	Water-bound
6	Berkshire Street, Page to Holly	Reconstruction of double track	2,700	1902	7-in., 70-lb. T	Gravel	Water-bound
7	Main and Oak Streets, Indian Orchard	Installation of double-track branch-off	.....	.....	.....	.....	.....
8	Memorial Square	Installation of single-track branch-off	.....	.....	.....	.....	.....
9	Main St. (W. Springfield) Park to Burford	Reconstruction of single track	3,024	1901	6-in., 60-lb. T	Gravel	Water-bound
10	Chestnut and Carew, and Plainfield and West	Installation of two electric track switches	.....	.....	.....	.....	.....
11	Carew Street, Main to Chestnut	Reconstruction of single track	1,580	1894	6-in., 60-lb. T	.....	Macadam
12	Chestnut Street, Liberty to Linden	Reconstruction of single track, with branch-off to Liberty	1,350	1904	9-in., 107-lb. girder	Gravel	Granite block
13	Woodlawn (West Springfield)	Reconstruction and relocation of track and overhead on state highway	4,000	.....	.....	.....	.....
14	Maple Street (Agawam), O'Briens Corner to Bridge Street	Double track extended	300	.....	.....	.....	.....
		Relocation of track	3,500	.....	.....	.....	.....
		Constructing new track	1,600	.....	.....	.....	.....

miles was rebuilt. Thus work was co-ordinated with the city's paving plans. Similar improvements will be made this year.

The work that was done covered nearly all lines in the system, as may be seen from the accompanying map. It comprised fourteen major jobs, which are indicated by numbers on this map and in the table which presents a summary of the work.

REASONS FOR REBUILDING

Single track on Belmont Avenue from the intersection of Sumner Avenue to the East Longmeadow line, a distance of about 5,000 ft., and on Sumner Avenue from Lenox Street to Lindale Street, about 2,500 ft., was replaced with double tracks. At the intersection a double-track crossing consisting of sixteen frogs, a single-track connecting branch-off, a single-track right-hand branch-off and three cross-overs were installed. On the map this work is indicated as jobs 1 and 2. The old 7-in., 70-lb. T-rail which was laid in 1896 and 1901, without ballast and in bituminous macadam, was removed. The new track replacing it was constructed with 7-in., 103-lb. girder rail installed on new ties on ballast of 6 in. of trap

rock. The new paving consists of 3 in. of asphalt on 6 in. of concrete. The work cost \$125,000 and took 63 working days to complete.

On State Street between Oak and Hancock Streets 1,200 ft. of double track was reconstructed. The old construction used 9-in., 125-lb. girder rail, which was installed in 1910 with sand ballast on a 6-in. slab of concrete. This was taken out and new 7-in., 103-lb. girder rail was put in. Here the sub-grade was not the same but trap-rock ballast was substituted for sand and a 6-in. concrete base was installed for the new asphalt pavement. This piece of work cost \$16,350 and was completed in fourteen working days.

Farther out on State Street, from Benton Street to Pine Point, the city repaved with asphalt, using the old cement-macadam paving as a base. It therefore became necessary to raise the company's tracks 3 in. for a distance of 4,200 ft. New 7-in., 103-lb. girder rail was laid on steel ties in concrete with a 6-in. concrete base for the asphalt pavement, replacing the old 9-in., 107-lb. girder rail which was installed in 1902 and was laid on dirt ballast. The time taken for this work was 37 working days and the cost was \$61,400.



New Yellow Coach at the Court Square terminal



New double track on Sumner Avenue east of Belmont Avenue



Double track installed on Belmont Avenue to speed up the service on a heavy traffic line

cost \$6,300. An unusual installation made at Memorial Square is a single-track connected branch-off with gantry construction. Memorial Square is a terminal of several lines and this loop was installed to facilitate the turning of cars. The track was ballasted with 6 in. of trap rock and 3 in. of asphalt top dressing on a 6-in. concrete base. The work cost \$7,000 and was completed in 21 working days. This is indicated as job 8. The single track on Main Street, West Springfield, from Park to Burford Avenue, 3,024 ft. long, was rebuilt. The original track consisted of 6-in., 60-lb. T-rail installed in 1901 with gravel ballast and water-bound macadam paving. This was replaced with 7-in., 103-lb. girder rail with 6-in. trap-rock ballast and a 6-in. concrete paving base. The job cost \$18,000 and was done in thirteen working days. It is indicated as job 9 on the map.

At Chestnut and Carew Streets and at Plainfield and West Streets two electric switches were installed at a cost of \$665. On Carew Street, from Main Street to Chestnut Street, 1,580 ft. of single track was rebuilt. The old 6-in. 60-lb. rail which was installed in 1894 was replaced by 7-in. 103-lb. girder rail. The old paving was macadam and the new rail was laid on 6-in. trap-rock ballast and 6-in. concrete base for the paving. Six working days were consumed in doing the work which cost \$8,600.

Reconstruction of 1,350 ft. of single track on Chestnut Street, from Liberty Street to Linden Street, and also renewing right-hand branch-off into Liberty Street was done in six days at a cost of about \$8,000. New 7-in. 103-lb. girder rail with 6-in. trap-rock ballast and 6-in.



New track on State Street laid in conformity with the city's paving program

concrete base for paving was installed in place of the old 9-in. 107-lb. girder rail installed in 1904, gravel ballasted with granite block pavement on a sand base. On the Westfield-Springfield line on account of the relocation of the state highway about 4,000 ft. of single track was shifted and the double track extended a distance of 300 ft. The job cost \$8,200.

Relocating 3,500 ft. of track on Maple Street, Agawam, from O'Brien's Corner to Bridge Street and constructing 1,600 ft. of track on Maple Street, from Bridge Street to Walnut Street, Agawam, on account of the construction of a new highway, took twelve days and cost \$10,600. It shortened the distance of the Feeding Hills line 3,500 ft.

Cincinnati Finds Foremen's Conference Helpful

UNDER the leadership of E. J. Jonas, superintendent of equipment, foremen's conferences are being conducted monthly by the Cincinnati Street Railway for the heads of the mechanical department. These meetings are attended by the assistant superintendent of shops, the equipment engineer, the general foreman, and all shop and carhouse foremen. As a rule the day foremen get together in the morning while the night foremen meet on the evening of the same date. An occasional joint meeting is scheduled, at which the attendance is 30 or more.

The meetings are usually opened with a constructive talk by the chairman or a guest. At times a special subject—such as accidents, pull-ins, economy or supervision—is assigned in advance of the meeting. This gives the members an opportunity to come prepared to discuss such subjects fully. These constructive talks and discussions have proved to be well worth while.

Time is provided on the program for each member to bring out suggestions, problems and tests of various kinds on which he has been working. These are discussed, committees are appointed to make further investigation, or any other necessary action is taken. In this way each member gets to know what the others are doing and how they are going about it. Many subjects come up in this way that are of general benefit to the entire department.

Car-miles per pull-in increased about 61 per cent in the last four months of 1927 over the same period of the previous year. This upward trend is continuing, and the improvement is attributed largely to the effect of these meetings.



Even though an automatic traffic signal is provided at this intersection pedestrians are using all crosswalks

Detroit Survey

Develops Basic Traffic Data

Commercial vehicles use only a few routes. Jaywalking and crossing against the red traffic lights are common practices. Extensive survey of travel habits shows wide variations in modes of transportation used

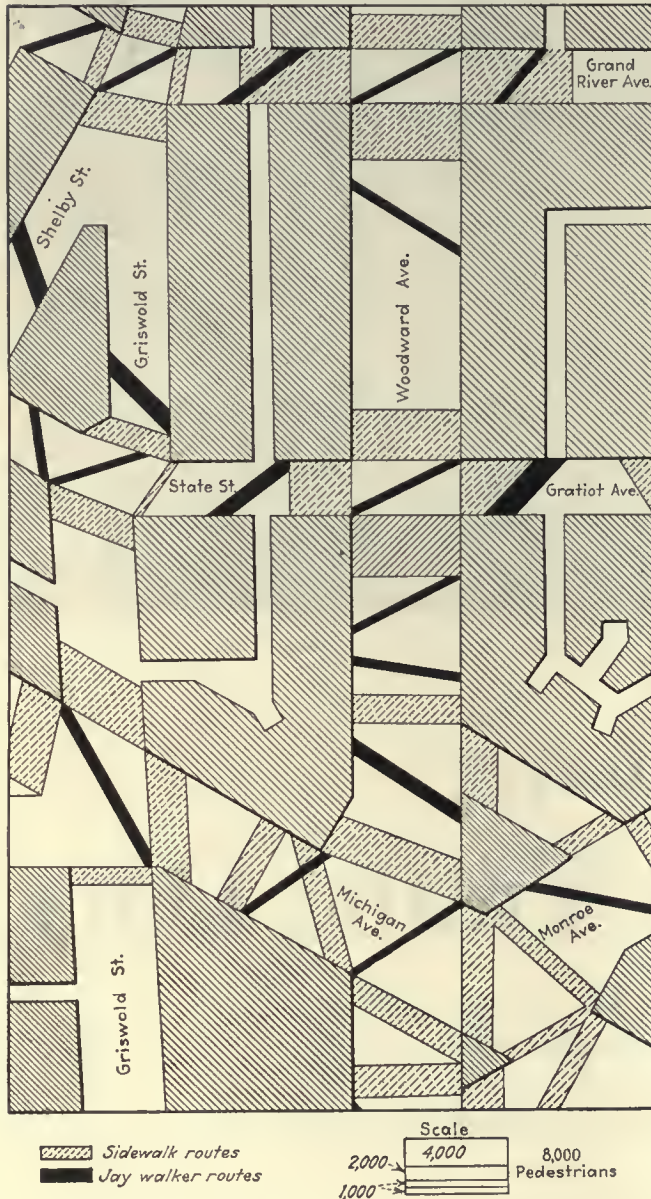
PART TWO

Unfavorable conditions existing in the alleys of Detroit, the parking situation, vehicular traffic flow and the movement of passenger transportation vehicles were covered in Part One, which appeared in the April 7 issue of this paper. The second and final article treats of commercial vehicle movements, regulation of pedestrians, the causes of accidents, a survey of travel habits, and suggestions for traffic improvement submitted by citizens.—EDITOR.

FREIGHT vehicles, being slow moving, impede the general movement of traffic to a considerable extent. Traffic congestion has been laid at the doors of the freight vehicles, and it has even been suggested that horse-drawn vehicles be prohibited in some districts during certain times of the day. Valuable information on the use of freight vehicles was obtained from several wholesale and retail merchants. A total of 5,435 commercial vehicles were owned and rented by the merchants who replied to the questionnaires. Of these 1,308, or 24 per cent, were horse drawn. Only 677, or 12.4 per cent, of the total horse-drawn vehicles were in use during the normal working day, so that they were not considered an important factor in the traffic situation.

The origin, route and destination of freight-carrying vehicles to and from the principal freight station within the downtown business district was the subject for another survey. A marked tendency was revealed for freight vehicles to move over a few selected routes. Other routes were available and just as short, but freight truck drivers found them less desirable to use, either because the paving was in poor condition or because parking interfered with the movement of their vehicles. The report recommends that freight pick-ups and deliveries be confined to the night hours in so far as practicable. This plan not only would speed up general traffic during the daytime, but also would prove economical for the trucking interests. The lack of spaces in which to park for unloading and picking up freight results in costly cruising. Of equal importance with the delivery and pick-up of wholesale freight is that of vehicles engaged in retail delivery. Though there is a marked diffusion of delivery routes, there is a natural tendency to follow the best and main arteries.

Traffic movement is hampered by cruising, as it is generally termed. Three types of vehicles indulge in this practice: private automobiles, trucks and taxicabs. Cruis-



Detroit has its share of the jaywalking habit, a pedestrian count revealed

The chart shows graphically the relative jaywalker and cross-walk movements. Of 293,195 pedestrians tallied, 27,521, or 9.4 per cent, were offenders. Detroit accident statistics showed that of the total pedestrian accidents, 42.4 per cent of the fatalities and 54 per cent of the injuries involved jaywalkers.

ing is classified in the report as a high-class nuisance and a very distinct obstruction to traffic movement. To determine the amount of cruising at certain locations in the downtown district, tallies were made which revealed that it assumes surprising proportions. To remedy the taxicab situation it was suggested that more stands be provided and that automatic control boxes be installed.

REGULATED PEDESTRIAN TRAFFIC MOVEMENT NECESSARY

Impatience is a pronounced pedestrian characteristic at controlled intersections, and the unwillingness to proceed in accordance with the signal indication is clearly shown in a survey made. The tally showed that of 12,566 pedestrians using a principal intersection, 44.33 per cent ignored the safety feature of the traffic signal and crossed through the traffic. Fatalities and injuries are very material from this cause, since the actual street hazard is 2½ times as great when crossing against the red signals. Pedestrian subways, overhead bridges, automatic control devices, marked lanes on the sidewalks and other means of bringing relief have been suggested, but their practicability is questionable.

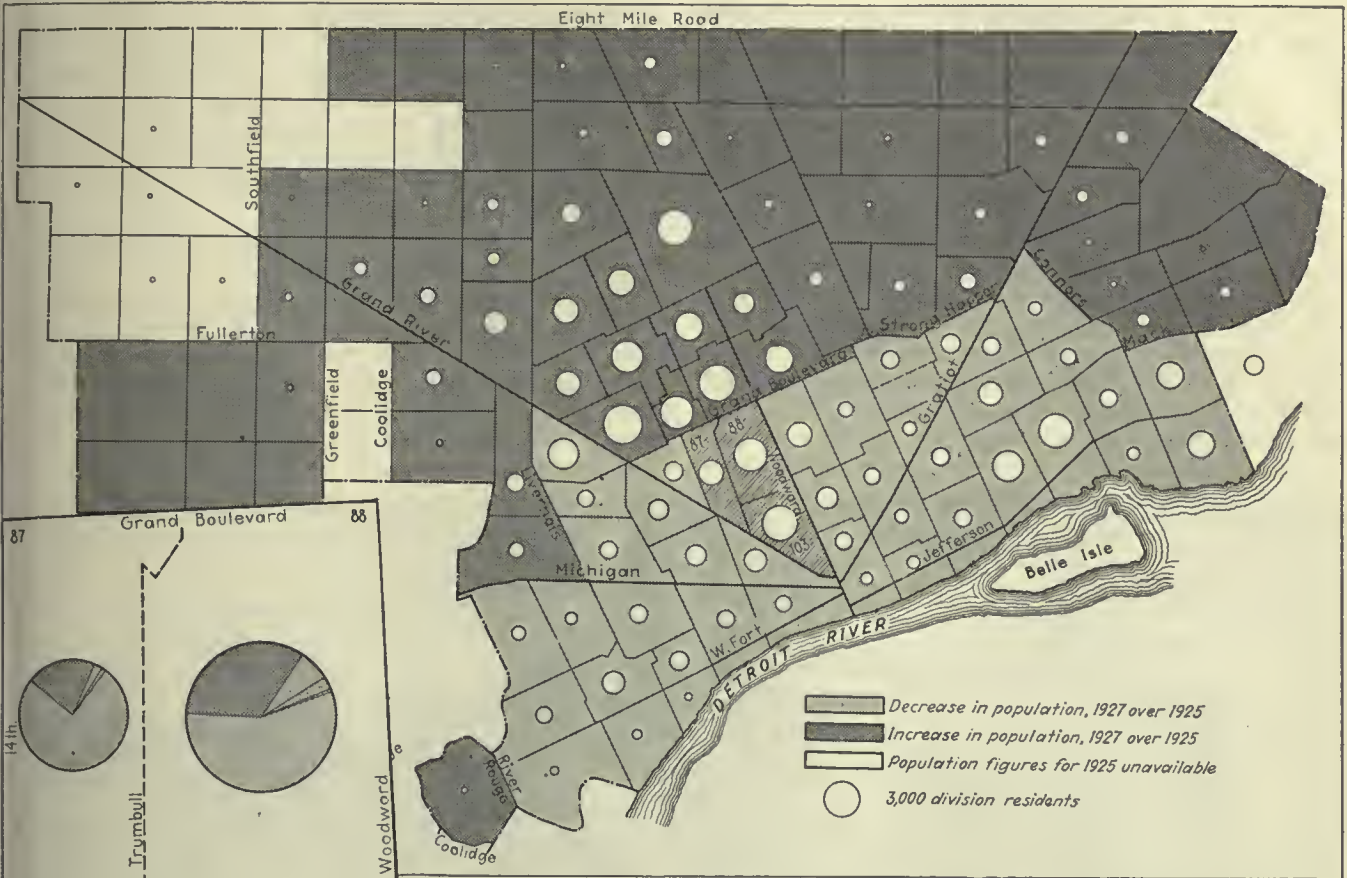
Another survey of pedestrian traffic movement showed that of 293,195 pedestrians tallied, 27,521, or 9.4 per cent, were jaywalkers. This figure might seem insignificant, but of the total pedestrian fatalities and injuries in Detroit, 42.4 per cent of the fatalities and 54 per cent of the injuries were directly traceable to this class. The jaywalker not only endangers his own life and the lives of others, but he also interferes materially with the movement of traffic. Remedial measures should be applied through educational channels, and regulation resorted to only when it becomes necessary.

Surveys of the number of pupils attending 40 public schools and the respective places of residence were compiled from the records of the Board of Education. The present methods of protecting the children while crossing the streets were determined from a field survey, which revealed that there was a need for additional protection. Suggested means for school locations were the installation of more automatic traffic signals, the use of pedestrian subways and the stationing of more policemen.

Information gathered by the Accident Investigation Bureau during the first four months of 1927 gives the details of 146 accidents involving 185 persons. Of these totals, 80 accidents involving 94 persons occurred in unprotected safety zones, one accident involving one person occurred in a protected safety zone and 65 accidents

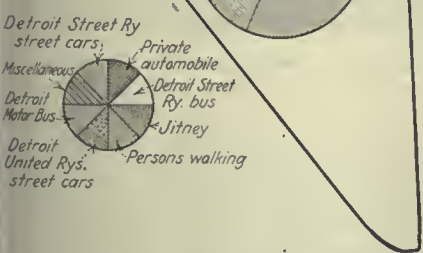
TABLE I—MODE OF TRANSPORTATION USED BY PERSONS LIVING IN DIVISION NO. 81 TRAVELING TO EMPLOYMENT DISTRICTS A TO K INCLUSIVE, CITY OF DETROIT

Type of Transportation	A	B	C	D	E	F	G	H	I	J	K	Total
Walking.....	17	..	16	3	19	4	50	5	5	103	6	697
Driving automobiles.....	6	..	13	..	3	2	12	1	2	..	1	227
Hiding in friend's automobile.....	40	..	5	4	190	21	140	14	..	237	6	657
D. S. R. cars, no transferring.....	..	..	..	..	1	..	3	..	1	11	..	16
D. S. R. buses, no transferring.....	..	..	..	..	..	..	..	..	..	..	..	0
D. U. R. cars, no transferring.....	..	..	..	..	..	..	..	..	..	..	..	0
D. U. R. buses, no transferring.....	2	..	..	..	4	1	21	1	3	61	..	93
Detroit motor buses, no transferring.....	..	..	..	..	5	2	..	..	..	53	..	60
Jitney, no transferring.....	..	..	..	..	..	..	..	..	..	..	..	0
Buses not listed, no transferring.....	..	..	..	..	..	..	..	..	..	..	..	0
Steam trains, no transferring.....	..	..	..	..	..	..	..	..	..	..	..	0
D. S. R. cars to D. S. R. cars.....	68	36	..	14	16	2	65	3	28	31	25	288
D. S. R. cars to D. S. R. buses or vice versa.....	19	..	..	..	..	..	..	..	1	3	..	23
D. S. R. cars to D. M. B. buses or vice versa.....	..	..	..	..	..	..	..	..	..	..	..	0
Other public service vehicle to any other public service vehicle.....	3	..	..	..	1	1	7	..	..	2	..	14
Total.....	155	36	35	21	241	73	903	67	40	501	43	2,115



Distribution by residence divisions of 80,000 persons leaving the downtown district between 5 and 6 p.m., with mode of transportation used

The insert shows how the detailed information of the mode used is shown on the map. A chart of this nature is particularly interesting to public transportation operators, since it indicates the travel habits of residents in every section of the city moving to and from any particular employment section. The areas of population increase and decrease show a movement from the closer-in section to the outer districts. Population figures were not available for seventeen districts.



involving 90 persons were caused by vehicles colliding with protected safety zones. Of the 65 collisions with protected safety

zones, 59, or 90.8 per cent, occurred from 6 p.m. to 6 a.m., a large proportion of which was considered chargeable to improper illumination. Corrective measures are being adopted through the installation of base lamps on the lighting posts in the safety zones. It was suggested that the ordinance requirement of "no parking opposite safety zone" be amplified to include a space of at least 30 ft. at both ends of all safety zones and car stops.

TABLE II—SUMMARY OF PERSONS TALLIED IN ELEVEN EMPLOYMENT DISTRICTS, DETROIT, MICH.

District	Area	Totals			Per Cent			
		Number Tallied	Walking	Using Auto-mobiles	Using Mass Transportation	Walking	Using Auto-mobiles	Using Mass Transportation
A	Ford River Rouge Plant.....	17,920	962	4,089	12,869	5.37	22.82	71.81
B	Kentucky-Rome-City Limits.....	536	83	147	306	15.48	27.42	57.10
C	Toledo-Junction-Michigan-Hubbard.....	5,900	1,062	1,496	3,342	18.00	25.36	56.64
D	Crawford-Lafayette-21st-P.M.R.R.....	4,500	1,050	929	2,521	23.33	20.64	56.03
E	Highland Park.....	11,530	2,802	1,328	7,400	24.30	11.52	64.18
F	Antoinette-Third-Custer-Woodward.....	3,288	817	711	1,760	24.85	21.62	53.53
G	John R-Custer-Helen-Kirby-Trombley.....	18,766	4,708	3,730	10,328	25.09	19.88	55.03
H	Hamtramck.....	615	158	148	309	25.69	24.07	50.24
I	St. Antoine-Lafayette-East Grand Boulevard-Detroit River.....	5,215	1,142	644	3,429	21.90	12.35	65.75
J	Loop District.....	24,609	1,229	4,934	18,446	4.99	20.05	74.96
K	Canfield-Gray-East Jefferson-Hart.....	8,662	2,881	1,214	4,567	33.26	14.02	52.72
Total.....		101,541	16,894	19,370	65,277	16.64	19.07	64.29

The origin, route and destination of passenger travel, as well as the type of vehicles used, why they are used and the time consumed in travel are important traffic studies. To determine the travel tendencies of persons employed in several sections of the metropolitan area, mode of transportation questionnaires were distributed among certain enterprises in representative employment districts, and 101,541 usable replies received.

The questionnaires requested place of residence; place of employment; normal mode of transportation used between residence and place of employment; the total time required in traveling between residence and place of employment; if using mass transportation vehicles, the number of blocks walked between residence and such vehicle and the number of blocks walked between such vehicle and place of employment; if automobiles were

of the city, the replies were separated into 132 residence divisions for Detroit and 23 divisions outside the city limits. The summary for one division, which is typical, is given in Table I. Summarized data for the eleven employment districts A to K are given in Table II. The per cent using mass transportation vehicles varies from 50.24 in the Hamtramck district to 74.96 in the downtown business district.

The data obtained from this survey were tabulated and charted to show the travel tendencies graphically. One of the accompanying maps shows the distribution by residence divisions of 80,000 persons leaving the Loop district between 5 and 6 p.m. and the mode of transportation used. The city was divided into 132 residence divisions for the purpose of the survey, and 23 divisions outside of the city limits were designated. In each divi-



View on Jefferson Avenue showing angle-parked commercial vehicles blocking the street and part of the sidewalk as well

used, whether they were parked in the streets or in a garage or parking lot; and the reason for the mode of transportation used.

An analysis of the 101,541 replies showed that 16.64 per cent of the persons walked, 19.07 per cent rode in automobiles, and 64.29 per cent patronized mass transportation vehicles of one kind or another. The proportion of walkers was found to be a minimum in the downtown district and a maximum in the east side district. The minimum and maximum number of persons traveling in motor cars were recorded in the Highland Park and West Warren Avenue districts, respectively. As for mass transportation vehicles, the minimum was recorded in the Hamtramck district and the maximum in the downtown district.

Further analysis showed that of the 101,541 persons tallied, 5.71 per cent procured their transportation through the use of friends' automobiles; 54.95 per cent rode the cars or buses of the Detroit Street Railway; 1.26 per cent were carried by jitneys; 4.23 per cent by the Detroit Motor Bus Company; 0.50 per cent by the Detroit United Railway and 3.34 per cent by steam trains and miscellaneous transferring means.

To obtain detailed information regarding each part

included on the map is a circle drawn to scale to represent the number of persons going to that division. Each circle, in turn, is divided into segments to show the relative numbers using the various modes of travel.

A summary of the reasons given by 9,954 people for the mode of transportation used by them is presented herewith: Most convenient—trolley cars; only means—trolley cars; quickest—automobiles; most economical—trolley cars; quickest and most convenient—automobiles; cheapest and most convenient—trolley cars; healthful and economical—walking; quickest and cheapest—trolley cars; dependable—trolley cars; and comfortable—automobiles.

Of those traveling by automobile to four employment districts surveyed, 33 per cent consumed more than 30 minutes of travel time; of those utilizing mass transportation vehicles, 57 per cent required time in excess of 30 minutes. A reduction in travel time to the aforesaid 77 per cent who use mass transportation vehicles would be a distinct contribution to the welfare of this number of employees. A reduction can be obtained either by workers living closer to their places of employment or by providing a faster mode of transportation.

To obtain figures on traffic direction and volume, pas-

senger and vehicle tallies were made at four approximately concentric cordons from 7 a.m. to 7 p.m. on a certain day. With these data and data secured at certain other critical locations, a vehicular traffic flow map was prepared. This map is shown in an accompanying illustration. Another exhibit was prepared showing the origin, destination and route flow of passenger automobiles, the data being secured by questioning passing motorists on the day of the cordon count.

The results show that motor traffic tends to concentrate on certain well-known routes even though alternative routes are available. It was learned, however, that certain habitual motorists used routes that they had found from experience permitted them to avoid the congested main thoroughfares.

Improvement in street pavement, parking restrictions and automatic signals were advocated as means of diluting the traffic now concentrated on a few thoroughfares. One-way streets and reversible center lines were named as possible improvement measures for certain streets.

TRANSPORTATION CONTROLS COMMUNITY DEVELOPMENT

The trend of business and building development can be controlled to a great extent through the medium of transportation. If the business district is easily accessible there is no reason to anticipate a reduction of people traveling into and out of that district. The important requirement is that transportation, both quantitatively and qualitatively, keep pace with the development of the business district, or, better still, keep ahead of it. By this is meant, where mass transportation vehicles are concerned, there must be a sufficient number to avoid undue crowding of passengers, and the headways should be such as to make long waits unnecessary; the speeds should compare favorably with those procured through the use of individual transportation units; and last, there should be in evidence the elements which contribute to bodily comfort—that is, comfortable seats, adequate lighting, proper heating and ventilation.

Through the medium of questionnaires an attempt was made to ascertain the present trend of shopping habits. A summary of the replies received from 80,000 shoppers shows that the trend is toward downtown purchases of clothing and furniture and toward neighborhood purchases of other commodities. Sixty per cent of the replies indicated that neighborhood stores are patronized more now than was the case five years ago. Recent proposed office building construction in the downtown district permits the inference that the number of people requiring transportation to and from the district will increase, bringing about centralization rather than decentralization.

It is assumed that the merchants and property owners in the downtown business area are interested in the procurement of efficient transport to and from that area. It is further assumed that such interest is not confined to them but is distributed throughout the metropolitan area and even in the suburban territory. Because of a universal demand for more efficient transport, plans should

Car Heating at Low Cost

Use of resistor losses for car heating in combination with regenerative braking has proved successful in an experimental car in Joliet, Ill.

Look for the feature article on this subject

In Next Week's Issue

which is devoted to MAINTENANCE AND CONSTRUCTION.

be made to provide additional mass transportation facilities. Also, more attention should be given to speed, comfort and shorter routes.

A material increase in persons to be carried from the downtown district can be met by an increased use of mass transportation vehicles and a decreased use of private automobiles. The automobile, the bus and the trolley car have definite places in the transportation field and each

must be recognized. The automobile occupying 60 to 90 sq.ft. of street space and carrying an average of 1.8 persons is far more wasteful of space than either a street car or a bus. Where there is a reasonable amount of street space available for all types of vehicles, the traveler should be allowed to exercise his option as to the type he prefers. For work, and for economic or other reasons, it is deemed necessary to curtail the use of the automobile and every consistent effort should be made to substitute a service comparable in speed and comfort.

In the conduct of the traffic study invitations were extended by letters, through broadcasting stations, personal contact and questionnaires to interested persons and organizations in Detroit to send in suggestions on traffic control and regulation. The keen interest of the general public was evidenced by the hundreds of replies received. Suggestions in regard to alley traffic were as follows: (1) Pave or cinderize, clean and illuminate the alleys; (2) enforce the rules regarding parking; (3) make the alleys wider. Those concerning safety zones were: (1) Enforce the safety zone parking law; (2) provide caution lights; (3) allow automobiles to pass the post type safety zone; (4) prohibit passing safety zones on the left. Many requests were received for more one-way streets. There was little agreement on turns and turning. The principal suggestion, however, was to prohibit left turns off the main arteries. Many asked that all streets with car lines be made stop streets.

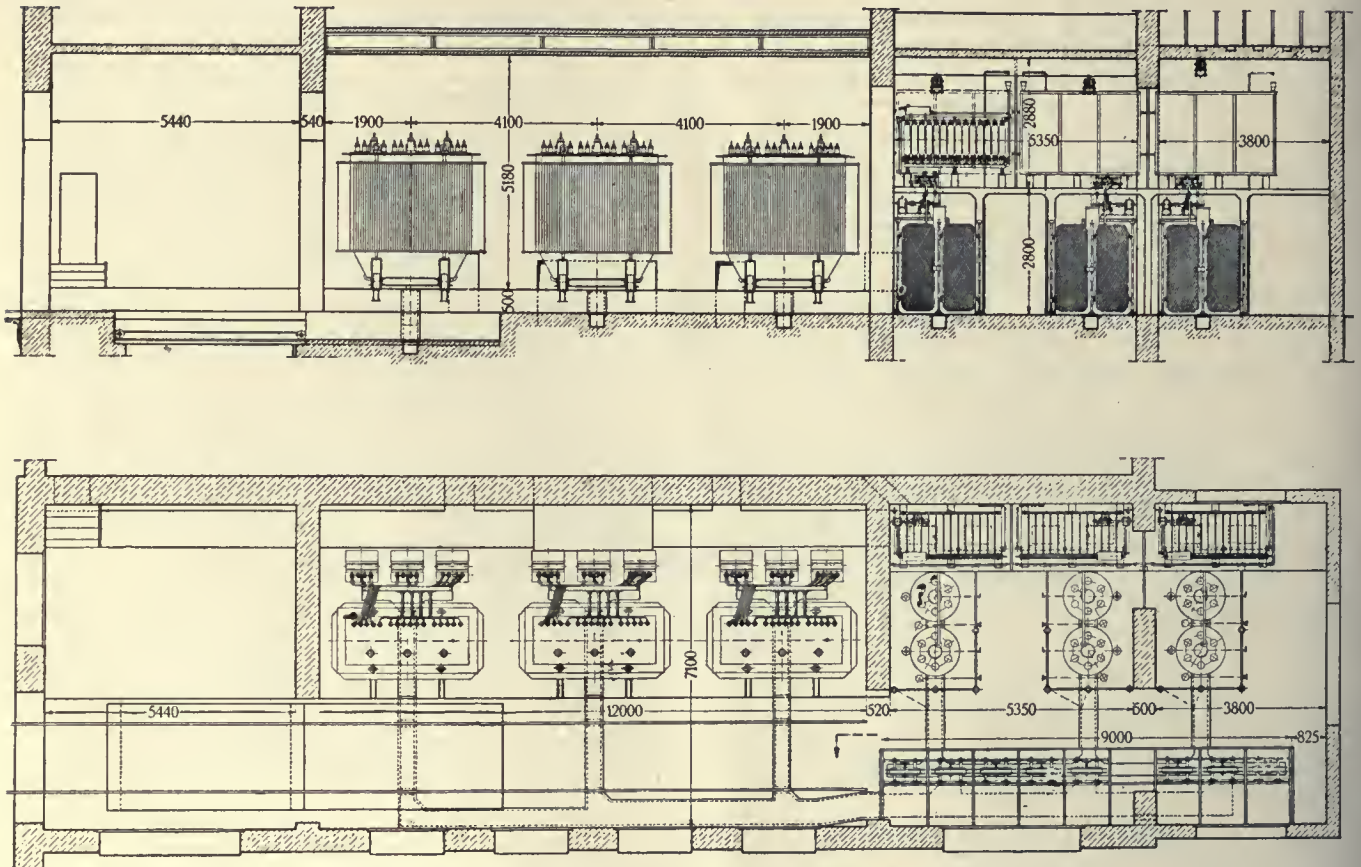
Many ideas were evoked with regard to the parking situation. The more popular suggestions were: (1) Prohibit all-night parking; (2) allow no double parking; (3) prohibit parking on stop streets; (4) permit no parking on car line streets; (5) abolish parking within the Loop district; (6) have more free parking space in the Loop district.

No Change in Chicago Parking Ordinance

IN AN abstract of an article on traffic and traffic control in various large cities by Dean J. Locke, published on page 548 of the March 31, 1928, issue of *ELECTRIC RAILWAY JOURNAL*, a statement was made "Within the past few days opponents of the plan have succeeded in securing an amendment to the ordinance permitting ten-minute parking of passenger automobiles within the Loop district of Chicago." It now appears that no modification of the ordinance effective Jan. 10, 1928, prohibiting parking in the Chicago Loop section during business hours has been made. It also appears that the few who earlier were opposed to the ordinance have now been converted and that there is no agitation to change it.

Mercury-Arc Rectifier Substations Used on European Railways

Adoption of 1,500-volt direct-current system by French government has necessitated extensive changes in power supply of Midi Railway



Plan and elevation of Montrejeau Station of the Midi Railway, furnishing 1,500-volt direct current through six 600-kw. mercury-arc rectifiers

CONSIDERABLE interest is being shown in Europe in the adoption of mercury rectifiers for substation operation on electrified main lines, and the outstanding success achieved by the first rectifier stations to be used on normal gage lines at a tension of 1,500 volts has stimulated inquiries for this equipment for similar pressures on other main lines. These first mercury-arc rectifiers for railway substations were installed at Pau, Lourdes, Tarbes and Montrejeau on the Midi Railway of France, by the British Brown-Boveri Company, Ltd.

The French government decided some time ago to standardize both the primary and trolley wire currents of all the electric railways, so that various power plants could work in parallel and the locomotives could be used on any of the electrified lines. Finally a line pressure of 1,500 volts direct current was decided on, and the Midi Railway was faced with the difficult task of transforming the already existing plants and of drawing up a new program of electrification.

The equipments of the four substations given above

are identical, and consist of three three-phase, oil-immersed transformers with natural cooling and short-circuit proof-winding supports, each built for 1,750 kva., pressure ratio 60,000/1,425 volts (twelve phase); six absorption choke coils, each 188 kva., 150 cycles, with natural cooling; three absorption choke coils, each 188 kva., 300 cycles, with natural cooling; six mercury-arc rectifiers, type GRZ 156, each built to deliver 600 kw.; three vacuum pump sets; three circulation cooling equipments; 60,000-volt a.c. switchgear; 1,500-volt d.c. switchgear and auxiliary equipment.

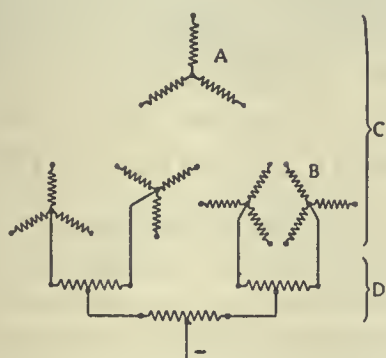
Another substation on the same system, that at Lannemezan, is similarly equipped, but contains four transformers, each of 1,750 kva.; eight absorption choke coils for 150 cycles; four absorption choke coils for 300 cycles; and eight mercury-arc rectifiers, each 600 kw.

Each transformer with three absorption choke coils and two mercury-arc rectifiers with accessories forms a set with rated output of 1,200 kw. The output of each of the four substations is therefore 3,600 kw., and that of the Lannemezan station is 4,800 kw. The aggregate

output of all the substations amounts to the total of 19,200 kw. In each station one set serves as a stand-by.

The 60,000-volt high-tension switchgear presents no new features. The twelve anodes of the rectifiers forming a set are directly connected to the twelve phases of the transformer over anode disconnecting switches. The secondary winding is subdivided into four three-phase systems displaced one from the other by 90 electrical degrees, and the four star points of these systems form the negative pole of one set, as shown in one of the diagrams. The cathodes of both rectifiers, which form the positive pole of the d.c. system, are connected to one another over two disconnecting switches. They have a common d.c. automatic circuit breaker by means of which the set can be linked up to the positive busbar.

The interlocking of the primary and of the d.c. automatic switches is shown in the special wiring diagram. The switching in push button B_1 serves to operate the



The four secondaries of the main three-phase transformer provide a twelve-phase circuit for the rectifiers

- A. Primary winding.
- B. Secondary winding.
- C. Transformer.
- D. Absorption choke coil.

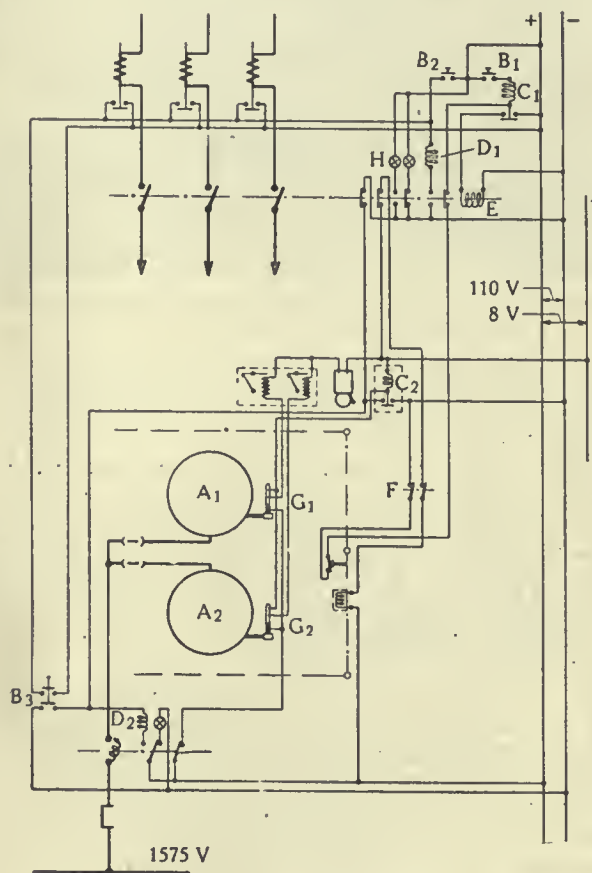
oil switch, which is provided with switching-in and tripping solenoids. This push button causes relay C_1 to act, which puts the switching in coil E under pressure. The oil switch and relay C_1 can, however, only be operated when the following conditions are fulfilled: (1) The oil switch is open; (2) the door of the protecting screen round the rectifier is closed, and (3) the hand switch F is closed.

The push button B_1 is used to trip the oil switch by connecting the tripping coil D_1 to the auxiliary busbars. The position of the switch is indicated by the two lamps H . The d.c. automatic circuit breaker is equipped with an over-current coil and a tripping coil and has to be closed by hand. The tripping coil is so connected to the oil switch on the primary side that it is only possible to close the automatic circuit breaker after the oil switch has been closed. If the primary oil switch trips, the automatic circuit breaker is immediately tripped as well. The object of this interdependence of the two switches is to prevent rectifiers A_1 and A_2 , for example, being put under pressure from the d.c. side. As, contrary to other machines and apparatus, the casing of the rectifiers is under pressure when in service, this precaution is essential for the protection of the operators.

Further protection is afforded by the screen round the rectifiers, the door of which is provided with a special lock, which can only be opened or closed when its interlocking coil is energized. In order to make it only possible to open the door when the oil switch is open, the circuit of this interlocking coil is led over an auxiliary contact on the oil switch shaft, which contact is only

closed when the switch is open. Further, in order to cut off the current through the coil during a long interruption of service, a two-pole hand switch, F , is provided, over the second pole of which the current of the switching-in relay C_1 is led, so that it is impossible to put the set into service again under these conditions.

To cut out a set, the d.c. automatic circuit breaker is first operated by hand and then the push-button switch B_2 . If, on the other hand, a set is to be cut out suddenly for some reason, it is simply necessary to operate push-button switch B_3 , which is specially marked and which



Special wiring of the rectifier for automatic operation

- A_1, A_2 . Mercury-arc rectifiers.
- B_1 . Switching-in push button.
- B_2 . Tripping push button.
- B_3 . Push button for switching out rectifier set.
- C_1 . Auxiliary relay for actuating the switching-in coil.
- C_2 . Auxiliary relay.
- D_1 . Tripping coil of oil switch.
- D_2 . Tripping coil of the d.c. automatic circuit breaker.
- E . Switching-in apparatus.
- F . Hand switch.
- G_1, G_2 . Contact thermometer.
- H . Signal lamp.

causes both tripping coils D_1 and D_2 to act simultaneously, thus isolating the set from both sides.

In order to protect the rectifier from excessive temperatures resulting from heavy loading, high surrounding temperature or failure of the cooling water supply, special alarm devices are provided which are influenced by the contact thermometers G_1 and G_2 mounted on the anode plates. As soon as the temperature exceeds 50 deg. C. a disk relay acts and operates an alarm bell. This disk shows which of the rectifiers has caused the alarm device to act. A second contact, which closes when 60 deg. is reached, acts on relay C_2 , the closing contact of which is in parallel with push-button switch B_3 , and puts the tripping coil D_2 of the d.c. automatic circuit breaker under pressure.

The auxiliary circuit, supplied at 200 volts, 50 cycles, feeds the motor of the circulating pump and that of the air pump, as well as the heating plate belonging to the high vacuum pump. To ignite the rectifier two small motor generator sets, each of 0.6-kw. output, are installed in each station.

The rectifiers are composed of two high-grade steel cylinders, one above the other and of different diameters. The lower and wider of the two forms the arc chamber. It is welded round its lower circumference to the funnel-shaped steel baseplate, in which is located the cathode. The upper and narrower cylinder forms the cooling dome or condensing cylinder in which the mercury vapor condenses in the form of drops and flows back to the cathode. The top and bottom of this cylinder are welded to massive steel plates. The upper plate carries the bosses for the connections of the vacuum piping and ignition gear. The latter is composed of a solenoid, to the iron core of which the ignition rod is attached in the vertical axis of the cylinder. The lower plate forms a ring and constitutes a cover for the arc chamber. It carries the six main anodes and the two excitation anodes, placed round the condensing cylinder. The arc chamber is not welded to the anode plate and the joint between them constitutes the primary mercury seal of the apparatus. If necessary, therefore, the upper part of the apparatus, together with the anodes, can be raised for inspection of the rectifier.

All the electrodes are carried into the arc chamber through porcelain bushings of high heat resisting qualities and mechanical strength. The electrodes are carefully insulated from the chamber. The mercury seal serves as a packing between the electrodes and the bushings, as well as between the latter and the arc chamber. It is also used between the anode plate and the arc chamber.

The cylindrical anodes are of polished iron, carrying at their upper ends terminals for the leads supplying the rectifier. To facilitate cooling, ribbed cast-iron sleeves are drawn over the upper part of the anodes. The cathode is built as a receptacle and holds about 48 kg. (104 lb.) of chemically pure mercury. It is situated in the baseplate and the joint is sealed with mercury. Both the arc chamber and the condensing cylinder are surrounded by a sheet-metal casing which serves as a water-cooling jacket. Each pair of rectifiers is equipped with a two-stage vacuum pump to exhaust the air and obtain the high vacuum essential. Each rectifier set is equipped with a separate cooling system.

An elevation and plan of the Montrejeau station, which is typical of the others, are shown in one of the illustrations. About half the total space in the substation was available for the equipment proper, the other half being required for the 60,000-volt apparatus. The rectifier transformers with the absorption coils were lodged in the rooms which formerly held the single-phase transformers when rotary converters were used. To carry off the heat generated by the losses of the naturally cooled transformers and choke coils, apertures which existed already between the cellar and transformer room were available, and these provide sufficient cold air draft. Parallel to their length there is a gangway with a standard gage railway track on which a special truck can be run, and placed exactly opposite the transformers. To aid in lifting the active part out of the tank, when necessary, there is a special pit with hoisting gear.

The rectifiers with their accessories and the switchboard are installed close to the place originally occupied

by the auxiliary machines and apparatus. The rectifier sets are situated by themselves and are under easy supervision from the switchboard opposite. The ignition and excitation apparatus is located in the switchboard.

In order to ascertain the efficiencies of the plants installed, the power received was compared with the power delivered, with the following results:

Load.....	1/4	2/4	4/4	5/4
Input, kilowatts.....	350	692	1,325	1,670
Primary pressure, volts.....	7,775	7,725	7,650	7,600
Primary current, amperes.....	30.0	54.5	102	131
Direct current, amperes.....	195	403	790	1,010
Direct-current pressure, volts.....	1,671	1,642	1,598	1,569
Output, kilowatts.....	326	655	1,262	1,585
Power factor.....	0.805	0.905	0.962	0.965
Efficiency attained, per cent.....	93.2	94.7	95.3	95.0
Efficiency guaranteed, per cent.....	92.0	94.5	95.1	95.0

The rectifiers have proved very satisfactory in service, and during the first six months of installation each station had to withstand about 230 short circuits. The station operators are said to prefer working on rectifiers to rotary converters on account of the noiseless operation of the rectifiers.

Modern Carhouse at Detroit Completed

Constructed at a cost of \$75,000, it will effect a huge annual saving. The terminal has outside storage facilities for 250 cars



In addition to the repair shop the carhouse has ample office space, sleeping quarters and assembly rooms for the trainmen

RECOGNIZING a long-felt need for suitable terminal facilities in the northwestern section of Detroit and realizing that a saving of approximately \$500,000 annually could be effected, the Department of Street Railways determined to provide the needed facilities. Accordingly during the early part of 1927 the management purchased a 20-acre tract for the development of such a terminal. The land is located on Coolidge Highway and cost \$280,000. Construction began soon afterward and the building, costing \$75,000, was formally opened on Feb. 26 of this year. It was built according to plans and specifications drawn by the department engineers and is modern and practical. It was designed and constructed to serve efficiently as both a storage and repair terminal for the street cars of the northwestern district. Segregation of the Grand River Avenue and the Jefferson Avenue lines will be made possible by the new terminal.

The carhouse has four tracks extending the entire length of the building. Three of these have work pits accommodating four cars each so that twelve cars may



Four tracks extend the entire length of the carhouse, three of which have work pits accommodating a total of twelve cars

undergo repairs at the same time. Along the fourth track is a shower-spraying device through which the cars pass for their semi-weekly bath. Another portion of the building is devoted to offices of the division superintendent and terminal clerks, while the trainmen's lobby occupies the remaining portion of the ground floor. On the second floor are the trainmen's assembly room and dormitories which provide sleeping quarters for the men who have certain late and early runs.

The storage tracks, adjacent to the building, will accommodate 250 cars and provides for rotary movement, making it unnecessary to back or turn any cars in entering or leaving the property. The Grand River line will be the first to utilize this new terminal station, and this arrangement alone will result in a saving of approximately \$225,000 annually through the elimination of waste mileage now consumed in storing the Grand River cars at the East Jefferson Avenue carhouse.

The terminal has a spur track leading to one of the

principal railroads, so that raw materials like sand, gravel, crushed stone, steel rails, ties, etc., can be transferred conveniently. They will be stored in the yard and distributed to locations on the west side of the city as needed.

Work has been started on a modern garage on the same plot which will store 80 motor coaches. Most of these are now being kept in rented garages in the northwestern section. The new garage will be ready for occupancy in 90 days, and it is anticipated that by mid-summer 1,000 men will be working from the combined railway and bus terminal.

Realty values showed a decided upward trend with the development of the tract. The construction plans of the Department of Street Railways were laid out to allow for a frontage of 663 ft. along Coolidge Highway available for resale. It is believed that this may be sold for a sum nearly equivalent to that paid for the entire tract.



The new terminal for the northwestern section of Detroit has outside storage facilities for 250 cars

Maintenance Methods and Devices

Jig Insures Accurate Boring of Armature Bearings in Housings

By J. A. DUFFY
Superintendent of Equipment Monongahela
West Penn Public Service Company,
Fairmont, West Virginia

BORING of armature bearings after they have been pressed in motor housings is the practice of the Monongahela West Penn Public Service Company. To make certain that the bore of the bearing is centered accurately from the outside finished portion of the housing, a special jig is used. This is shown in the accompanying illustrations, arranged for a Westinghouse type 306 motor housing. The jig is for split frame motors but can be used for any motor by having suitable filler rings. After the bearing has

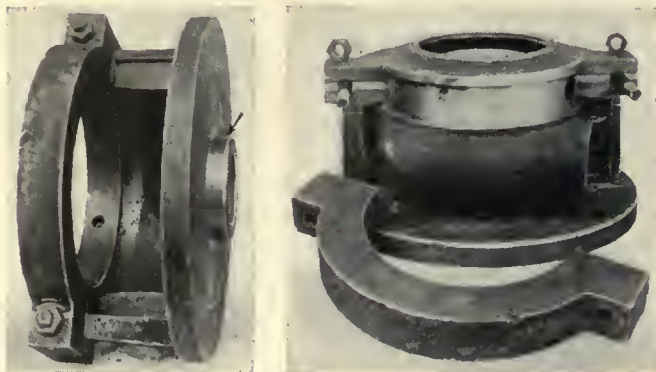
been pressed in, the housing is clamped in the jig and is then set on a face plate or put in a lathe for boring. One end is arranged as a guide for the boring bar. This self-centers the job ready to be bored out.

It is also the practice of the railway to build up the outside portions of Westinghouse 306 motor housings that have been worn and so are somewhat loose in the motor shell. The housing is placed in a welding and grinding machine so that the housing is rotated as it is welded. An extension welding arm is arranged so as to

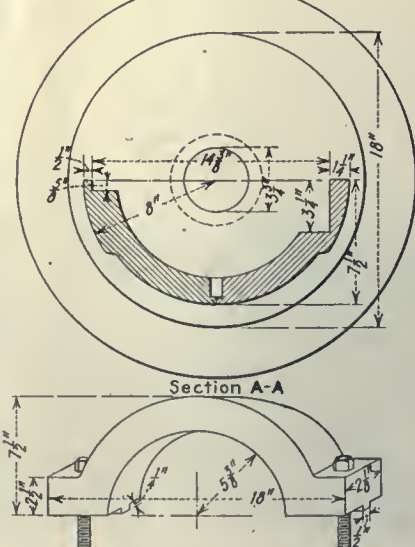
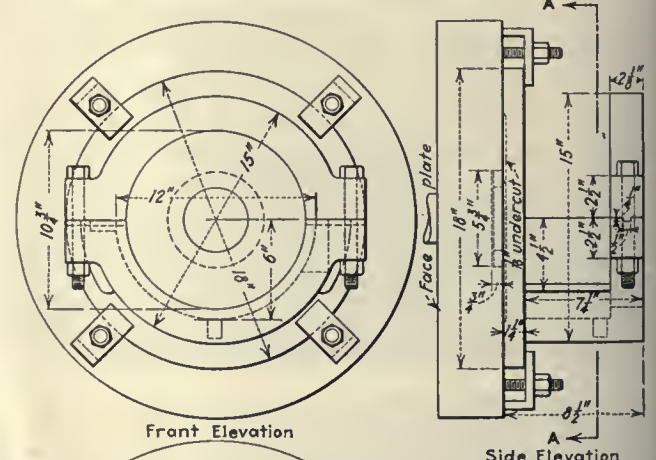
get close to the work. When the machine is started the welding head automatically does the welding of one bead and the operator shifts the arm when the machine automatically welds up another bead without further attention.

Winders Portable Tool and Material Rack

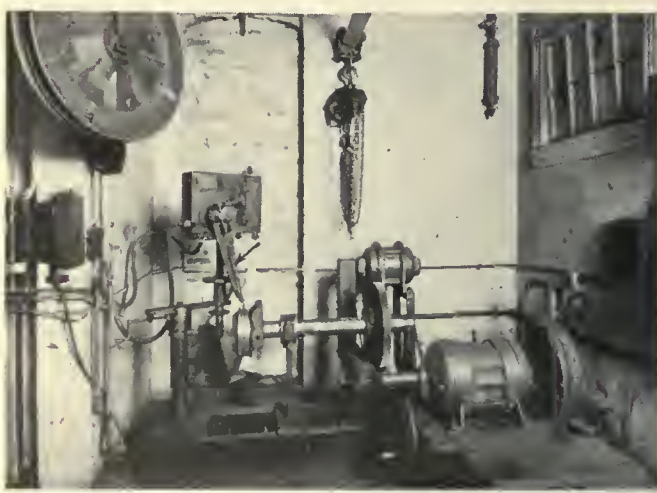
SINCE considerable time is lost when material and tools are not within easy reach of the armature winder and as a result production suffers, General Foreman Johnson of the Binghamton Railway, Binghamton, N. Y., designed and constructed a portable rack to avoid the delay caused by going for tools and material frequently. This rack is all metal and is made of angles, sheet steel and pipe. Four 3/4-in. conduits form the corner posts. The top of each is



At left—Type of jig used for boring out motor housing. Arrow indicates face plate which self-centers the job ready for boring. At right—Jig with housing in place ready to be clamped



Details of jig for boring armature bearings



Building up the outside surface of a motor housing. Arrow shows extension arm provided to get close to the work



Convenient material rack for the electrical repair department

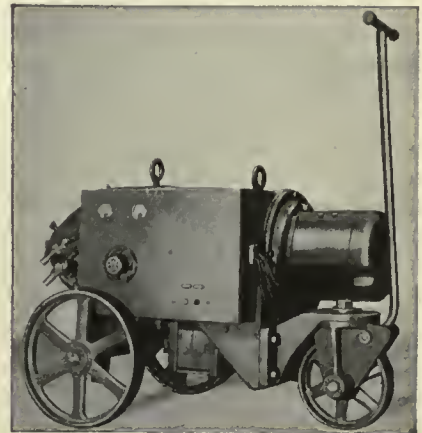
fitted with a $\frac{3}{4}$ -in. 90-deg. flange and the bottom with a 2-in. swivel roller. A tray 18 in. square and $\frac{3}{4}$ in. deep is made of 1-in. angles and $\frac{1}{8}$ -in. plate. All joints are acetylene welded. This tray is bolted to the 90-deg. flanges by $\frac{3}{8}$ -in. machine bolts. A similar tray is installed 13 in. below this and still another one 12 in. further down. It should be noted that the angle framework for the middle and lower trays is shaped around the outside of the $\frac{3}{4}$ -in. posts and fastened to the post by a $\frac{3}{8}$ -in. through machine bolt. The sheet steel bottom of these trays is welded to the angle in the same manner as was done in constructing the top tray. This rack is very well constructed and no motion exists between any of the parts. Since it contains three 18x18-in. trays ample space is provided for the storage of practically all the material and tools necessary for a complete winding job. The rollers permit of easy movement to any position convenient for the performance of the work.

They serve a further purpose in that the overhauler can see the exact number of O.K. cylinders on hand at a glance.

New Equipment Available

Single Operator Arc-Welder

PUSH-BUTTON control features a Westinghouse, 200-amp. single-operator welding set, designed to meet requirements in both shop and field. The set is started by connecting directly across the line by means of a line starter and line-start motor.



One-man 200-amp. arc welder

Controller Main and Reverse Cylinder Racks

IF OVERHAULED controller cylinders are not taken care of properly prior to installation in the controller, there is a possibility of damage. Where this occurs it is not detected very often until after installation or when a road failure has developed and interrupted service. Where this possibility exists it is important that some precautionary measures be taken. On the New York & Harlem Railroad, New York City, care is exercised to protect repaired controller cylinders. A cylinder storage rack adjacent to the overhauling bench is used for the storage of the cylinders until they are required for service. The rack referred to is shown in the accompanying illustration. The main cylinders are stored on a rack made from 2x5-in. oak boards installed vertically at the proper centers to accommodate the cylinders and tied together top and bottom by a 1x3 $\frac{1}{2}$ -in. oak board. The front of these uprights is provided with 1x8 $\frac{1}{2}$ -in. notches cut at an angle of 25 deg. on 6-in. centers. These notches provide a safe and substantial support for the cylinder shafts. Each rack will hold seven cylinders. The same construction is followed for the reverser cylinders except that the boards are

4 in. wide, the slots 1x2 $\frac{1}{2}$ in. and the centers 4 in. It will accommodate eleven cylinders.

These racks contain completely overhauled cylinders and every man in the shop knows that any cylinder stored here is available for service.



Storing cylinders in this neat and systematic manner has improved the shop appearance and lessened the possibility of mechanical injury prior to installation

Starting and stopping are accomplished by a push button. A single rheostat varies the arc current over the entire welding range. Accurate adjustment from 60 amp. to 300 amp. is afforded by steps of 5 amp.

The motor-generator and control equipment are assembled in a totally inclosed frame. The exciter, which is overhung from the motor end, is fastened securely to the unit frame, guarding the operator against injury and protecting the set from dirt and falling objects.

Steady welding current, insuring thorough penetration and fusion of the weld, is obtained from a constant-current generator. A separate exciter insures a high speed of welding, and a generator voltage that responds to any changes in arc conditions. This tends to maintain a constant rate of fusion of the electrode.

The unit is rated at 200 amp., 1 hour, 50 deg. C. temperature rise on a resistance load at 25 volts. This conforms to the standard rating of the

National Electrical Manufacturers' Association. The motor is wound for 220 or 440 volts and is assembled with the necessary connections made for driving from a three-phase 60-cycle circuit. For use on a 440-volt, three-phase, 60-cycle circuit, it is only necessary to replace the operating coil on the magnetic starter and to reconnect the motor leads.

Welder Tractor Combination

COMBINATION of an electric arc welder with a Fordson tractor in an improved form is now offered by the General Electric Company, Schenectady, N. Y. The chief improvements of the outfit consist of the substitution of a new type welding equipment and the addition of head and tail lamps and a protective cover.

The principal equipment consists of a standard Fordson tractor, belt-connected to a type WD-300-A, 25-volt, 300-amp., one-hour rated 1,750-r.p.m., ball-bearing generator. This unit is mounted directly on the tractor and is protected by metal canopy and canvas side curtains. Other equipment includes governor, power take-off, muffler, waterproofed pulleys on engine and generator, belt and belt tightener, industrial disc-type rubber-tired wheels front and rear, extension frame, off-set crank, control panel and reactor, head and tail lamps, and battery and charging control. Light industrial spoke-type wheels front and rear or standard Fordson farm wheels front and rear, and any other desired accessories are optional.

The over-all length of the complete unit is 12 ft.; the height is 4 ft. 8 in.; the width is 5 ft. 2 in., and the net

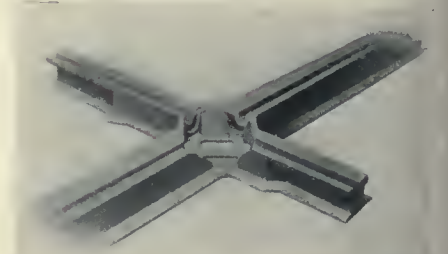
weight is approximately 4,900 lb. The utility of the tractor as a hauling device has not been impaired. For field use, the unit will haul equipment and tools to the job and then supply welding current. For welding along railroad rights-of-way, extra long welding leads are not necessary because the equipment is so easily moved at a moment's notice. The battery which supplies current for the lights and ignition is charged while the welding generator is operating. It is provided with ammeter and automatic cutout.

Manganese Crossing Designed Scientifically

DESIGNED for use in electric railways where they cross steam runs or for heavy steam railroad traffic, a scientifically constructed manganese crossing is announced by William Wharton, Jr., & Company, Inc., Easton, Pa. This has been brought out as a result of a scientific investigation and study of manganese crossing designs made during the last four years by engineers of the company. The investigation was made from two major viewpoints: first, to obtain minimum unit stresses in the structure when in service, and, second, to determine just what sections could be cast and heat-treated with the assurance that the metal would be sound throughout.

The new type of crossing incorporates a number of new features. In the first place, there is uniformity in the metal sections under the tread and groove surfaces, an advantageous feature which became evident early in the investigation. There are no supporting members joining the under side

of the tread and groove metal, thereby eliminating the danger of shrinkage, cavities and heat treatment defects in the metal surrounding the intersection of the gage lines, the point where most crossings fail. A bottom grid or floor beneath the intersection of the flangeways forms a



Features of the manganese crossing

hollow, box-like structure at this point, which is said to give the crossing extreme resiliency and strength, and at the same time avoids excess weight.

Cross-members in the arm sections of the crossing form a strong tie to prevent the side walls from spreading, but these members do not come in contact with the under side of the tread or groove surfaces, thereby avoiding the possibility of interior defects which so frequently cause cupping in the tread surface. The side walls of the crossing are tapered, being thicker at the top where they join the under side of the tread and guard sections.

This feature was incorporated to decrease the unit stresses in the groove and to permit a gradual transition of metal sections, from the thick tread to the thin outer flange of the base.

In arriving at the new features of this crossing, the Beggs method of analyses of stresses was followed, using a Beggs deformeter, and studying the resulting stress reactions under the microscope. The findings in these studies were checked by Prof. Mortimer F. Sayer of Union College, employing a photo-elastic model method of polarized light analysis, and the results produced were found to be remarkably close.



Fordson tractor used for welder mounting

American Association News

Rules for Engineering Committees

MEMBERS of the various committees of the Engineering Association are receiving from General Secretary J. W. Welsh copies of a pamphlet giving the regulations governing committees, the adoption of standards, and the style of specifications. This is a revision of a former publication on the same subjects. It includes sections on the purpose and scope of committee work, committee organization, instructions to committees, committee reports and standardization rules, American Engineering Standards Committee, illustrations, style of specifications, Engineering Manual and changes in rules.

The instructions to committees give clearly the procedure in conducting committee work and joint work with other organizations, a list of abbreviations and material to be included. Specific instructions are given for the preparation of reports, formulation of recommendations, and methods of preparing illustrations and specifications.

Purchases and Stores Accounting

MEMBERS of two association committees held a joint meeting in the offices of the Cincinnati Street Railway, Cincinnati, Ohio, on March 19. These were the purchases and stores committee of the Engineering Association and the stores accounting committee of the Accountants' Association. Subjects discussed were the review of the Engineering Manual, led by J. Fleming; unit piling and standard packages, led by W. E. Scott; investment in materials and supplies, led by C. A. Harris, and price records and pricing materials and supplies, led by A. A. Ordway.

Those present were J. Y. Bayliss, chairman; A. A. Ordway, vice-chair-

man; W. J. Walker, secretary; B. W. Forkner, A. L. Fischer, A. E. Hatton, C. A. Harris, H. B. Kirkland, F. E. Wilkin, W. S. Stackpole, A. S. Duncan, W. E. Scott, E. A. Murphy and John Fleming.

T. W. Casey to Represent Association at Rome

THOMAS W. CASEY, president National Pneumatic Company, has been appointed by the American Electric Railway Association its official representative at the Rome convention of the Union Internationale de Tramways, de Chemins de fer d'Intérêt Local et de Transports Publics Automobiles. Mr. Casey sailed on the *Roma* for Naples on April 13.

Mr. Casey is a member of the executive committee of the association.

A.I.E.E. Regional Meeting at New Haven

INSPECTION trips and technical papers of unusual interest make up the program of the fifth annual meeting of the Northeastern District, American Institute of Electrical Engineers, to be held at the Hotel Taft, New Haven, Conn., May 9-12.

A major part of the four technical sessions will be devoted to four unique engineering developments in the vicinity. These include a hydro-electric project, electric railway power from rectifiers, variable-ratio frequency changers and mercury turbines. A paper will be presented on the exclusive use of mercury-arc rectifiers for supply power to a trolley system and another on inductive co-ordination between the railway feeder system and local communication circuits where these rectifiers are in use. The eco-

COMING MEETINGS

OF

Electric Railway and Allied Associations

April 25-27—American Society of Civil Engineers, spring meeting, Washington Hotel, Washington, D. C.

April 25-27—American Welding Society, annual meeting, 33 West 39th Street, New York, N. Y.

April 26-28—Missouri Association of Public Utilities, Jefferson City, Mo.

May 2-5—Southwestern Public Service Association, Dallas, Texas.

May 4—Metropolitan Section, A.E.R.A., 33 W. 39th Street, New York, N. Y.

May 6-12—Union Internationale de Tramways, de Chemins de fer d'Intérêt Local et de Transports Publics Automobiles, Rome, Italy.

May 8-11—United States Chamber of Commerce, Washington, D. C.

May 9—A.E.R.A. Executive Committee, Washington, D. C., 3 p.m.

May 9-10—Central Electric Railway Master Mechanics' Association, Lawrence Hotel, Erie, Pa.

May 24—New England Street Railway Club, annual meeting, Boston, Mass.

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

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

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

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

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

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

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

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

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

SEPT. 22-28, 1928

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



Members of the purchases and stores committee and the stores accounting committee in session at Cincinnati

Left to right: B. W. Forkner, A. L. Fischer, A. E. Hatton, C. A. Harris, H. B. Kirkland, W. J. Walker, J. Y. Bayliss, A. A. Ordway, F. E. Wilkin, W. S. Stackpole, A. S. Duncan, W. E. Scott, E. A. Murphy and John Fleming.

nomics of power supply for railroad electrification will be covered by another paper.

Two papers will deal with 25-cycle power obtained through two variable-ratio frequency-changer sets, one deriving power from another 25-cycle source, and the second, power from a utility system at 60 cycles.

News of the Industry

Ultra Modern Chicago

Surface Lines engineer urges three-level streets and rigid traffic code to improve safety

Public safety in the city of Chicago is being hindered by the present deplorable physical condition of its streets, E. J. McIlraith, traffic engineer for the Chicago Surface Lines, told delegates to the Midwest Safety Conference recently held in that city.

Mr. McIlraith blamed poor paving outside street car tracks and rough pavement on many streets in residential sections for the hazards and delays to traffic. In order to provide funds for necessary repairs he recommended that a new gasoline tax law be enacted to take the place of the one recently declared unconstitutional and revoked by the Illinois Supreme Court.

Safe travel in Chicago's densely congested streets, he said, would be greatly enhanced by provision of a three-deck street system in the downtown business district. Such a system should include a subway, an intermediate thoroughfare for pedestrians and at the present street level a street for motor traffic. He declared:

Chicago is in a deplorable condition for lack of transportation facilities, continuous streets, smooth paving, grade separations and convenient access to radial highways.

Sufficient through streets are lacking because everywhere they are interrupted by railway yards, embankments, rivers, canals, parks and undivided areas.

Simple planning and reasonable investment, however, will make a marvelous improvement in traffic convenience. Improvements for the future must also include grade separations and perhaps two-level highways where justified.

The outstanding fault responsible for most traffic accidents, it was said, was the laxity of law enforcement. Mr. McIlraith advocated the adoption of a traffic code that will inflict severe punishment on the careless and law-ignoring drivers who annually kill hundreds of Chicagoans and injure thousands.

He added that since the no-parking ordinance was put in effect on downtown streets last January, a survey has shown that accidents have decreased more than 30 per cent.

One-Fare Extensions Considered by Missouri Body

The Missouri Public Service Commission has under advisement several applications for an extension of the St. Louis, Mo., one fare zone to various sections of St. Louis County. Commissioner John H. Porter on March 29 concluded a hearing on the proposals at the St. Louis City Hall. The city of St. Louis and the St. Louis Public Service Company opposed the proposed fare

concessions while numerous real estate dealers and officials of some of the incorporated communities which are located in St. Louis County favored the applications.

The company and the city of St. Louis contended that the county lines are now operating at a loss and any deduction from the revenues of the Creve Couer Lake and Clayton lines as proposed would tend to react unfavorably on the rates in St. Louis. William B. Bennett, valuation engineer for

the company, testified to the average revenue per car-mile in St. Louis and declared that if transfers to the Clayton line were permitted and each car carried the maximum number of passengers the line could not pay.

At present transfers are furnished from the Olive-University to the Kirkwood-Ferguson cars going to Clayton and vice versa. The railway company favors doing away with this concession now that other parts of the county are seeking a similar privilege.

Fare Changes in Los Angeles

Local charges on Pacific Electric are reduced to 5 cents. Suburban reductions range from 20 to 25 per cent. Experimental rates to go into effect between certain cities

SWEEPING changes in the Pacific Electric Railway's fare schedule in Los Angeles and adjoining counties were announced by the California Railroad Commission on April 7. Approximately two-thirds of the one-way and round-trip fares charged by the company, affecting about that proportion of the bulk of the company's business, are to be reduced. The order is to be put into effect within twenty days and to remain in force until further ruling of the commission.

Local fares in Long Beach, Glendale, Riverside, San Bernardino, San Pedro, Santa Monica and other centers are to be reduced by the commission's order from 6 cents to 5 cents. In Los Angeles the present fare of 6 cents which the Pacific Electric has been charging is to be reduced to 5 cents, but the fare zones are to be made smaller. Reductions on suburban one-way and round-trip fare schedules will range from 20 to 25 per cent. At the same time the commutation rates are to be increased from 10 to 20 per cent on practically all lines. An experimental monthly pass, good for daily travel between Los Angeles and Pasadena and entitling the holder to local transportation on both ends of the line, is to be issued for \$9. A Sunday pass, good for unlimited travel on all lines of the road west of Upland and exclusive of the Mount Lowe division, will sell for \$1. This pass will be limited in use to the Sunday for which it is sold. The commission's order states that the commutation rate structure is simplified by the elimination of some of the forms of tickets to be sold, namely, the monthly, 30-ride and 10-ride tickets.

The order reads in part as follows:

The general basis of the experimental fare structure authorized and directed by the decision is the so-called Glendale experiment which has been in progress for nearly a year, and from which satisfactory results were obtained. In general, the Glendale experiment provided for an increase

in commutation fares and a substantial decrease in one-way and round-trip fares.

Under this Glendale experiment patronage of the line gradually increased until the financial results to the company were more satisfactory although, on the whole, the fares were lower than formerly.

The schedule, the commission announced, is an experimental one to test its theory—that keeping fares at or close to 5 cents will develop more business, and thus eventually result in increased revenues.

Experimental fares, between Los Angeles and Venice and Santa Monica, of 30 cents one-way and 50 cents round-trip have been ordered. In general round-trip fares will be double the one-way fare, less 5 cents where the one-way fare is 15 cents, and not more than 25 cents, and less 10 cents where the one-way fare is in excess of 25 cents.

Survey Bill Killed in St. Louis

The St. Louis Board of Aldermen on March 30 killed by a vote of nineteen to nine Mayor Miller's bill for the establishment of a transportation survey commission which presumably would have paved the way for a rapid transit system in the city. The bill was brought before the Aldermen for the approval of amendments offered by Mayor Miller, but the opponents took advantage of this situation to force a vote on a motion to file it. The fight on the measure centered on the Mayor's proposal that the city be refunded \$100,000 by the St. Louis Public Service Company for a similar appropriation to be made by the city to defray the costs of the survey. Opposition to this plan was led by Walter J. G. Neun, president of the Board, who relinquished his chair to Vice-President Neumann and opened the debate on the floor. He said that he was in favor of the bill, but was opposed to the provision that the railway should defray the expenses of the survey.

Fifteen-Cent Bus Fares Sought in Kansas City

The Kansas City Public Service Company has submitted to the City Council of Kansas City, Mo., a request for a 15-cent bus fare for the downtown uses. Up to this time that fare has been 10 cents. New bus routings were embraced in the suggestions filed with the city clerk, together with a detailed report of losses under the bus operations of the last two years.

In this document Powell C. Groner, president of the company, pleads that the street car rider should not be asked to make up a deficit occasioned by those who prefer a more luxurious service downtown, with a seat guaranteed.

Twelve suggested bus routes are offered in place of the existing eleven. The Country Club Express line, formerly a 25-cent line, would be 15 cents, with ordinary instead of the present deluxe equipment. The infrequently used Blue Valley line would be discontinued, and the Leeds line developed into a Crosstown line to St. John Avenue. This feeder line would have a 10-cent fare. Three distinctly new lines are proposed: a Chestnut line, an Oak Street feeder line, and a 63d Street Crosstown line, all feeder lines each with a 10-cent fare. The company estimates a 10 per cent decrease in patronage on the trunk lines under the 5-cent fare.

An estimate of yearly earnings was submitted to the Council, based on altering trunk line service at 11 o'clock, and stopping service on some of the feeder lines at 8 o'clock. It is estimated that with this service there would be an annual deficit of about \$140,000 as against the 1927 deficit of \$210,204 and the 1926 deficit of \$319,790. Mr. Groner says:

The proposed plan would not make the bus system self-supporting. This is due to the large amount of feeder mileage. It is very doubtful if for years these feeders will pay operating costs. The substitution of bus service for railway service at the eastern end of the Fifth Street car line would eliminate the rebuilding of tracks at a cost of \$77,000.

Eliminating interest on the investment, the Armour-Paseo double-deckers were the only buses to earn a profit last year, the profit being \$431.

Mr. Groner concedes the new bus franchise or permit should not run for more than five years, due to the present experimental state of such services as those proposed to be rendered.

Initial North Jersey Line Plan Announced

Tentative specifications for the rapid transit line proposed to connect Newark, Paterson and Hackensack as an initial step in the development of rapid transit throughout Northern New Jersey have been announced by the North Jersey Transit Commission. They will be used in detailing costs, construction types, and rights-of-way in preparation for presenting definite recommendations for

financing and construction to the State Legislature at its 1929 session. According to the announcement the plan involves a total of approximately 22.6 miles of construction in connecting the three terminal cities. Approximately 2.3 miles will be in subway, 7 miles on elevated, and 13.3 miles on grade and fill with all grade crossings eliminated.

Give and Take Proposed in Ohio City

The railway situation in Springfield, Ohio, appears to be rapidly approaching a crisis. On April 10, W. H. Sawyer, receiver of the Springfield Railway, notified the city that service on the Madison-Ludlow Avenue line would be discontinued on April 15 and that during the week cars on that line would operate on a 20-minute schedule only between the hours of 5:30 a.m. and 9:30 a.m. and from 2:30 p.m. to 6:30 p.m. The receiver declared that curtailment was necessary as part of the program to make the railway pay, if possible.

When he took over the lines, the receiver issued a statement indicating that buses would be substituted on some routes and that probably an increase in fare would be requested. The action on the Madison Avenue division is the first concrete move to be made.

City Manager Flack has declared the situation would have to be solved by "give and take." He said:

There is no question in my mind that the railway system has too much financial overhead to bear. Even if we granted a fare increase and even if we waived payment of cost of paving between the tracks, the company would still operate at a loss. Springfield needs a transportation system, and the city must make some concessions, but we must also demand that the railway also make concessions.

The city manager pointed out that if the city refused to take any action the property would be practically valueless. In conclusion he said:

But we must have some kind of service and I believe that some basis for adjustment can be reached.

In an effort to clarify the controversy, between Springfield and the Indiana, Columbus & Eastern Traction Company over the railway paying its share of the cost of paving two streets, city officials with J. M. Pogue, general manager of the company, will interview Federal Judge Killits to determine the attitude of the court toward permitting the utility to assume a share of the paving cost.

In one case, the Springfield Railways, operating the city lines, discontinued service on a street and tore up its track when the city sought to have its share in the paving. Railway operators hold to the view that it is unfair to require the utilities to help with the burden of paying for paving to make streets better for a competitor—the automobile. Nothing came of a proposal made recently by one of the railways to help pay if the city would ban parking in the congested district downtown.

No Purchase of Interurbans by Erie Railroad

Any ideas that may have been harbored by officials of the Erie Railroad looking toward the purchase of the Buffalo & Lockport, Lockport & Olcott and Buffalo-Niagara Falls high-speed interurban lines from the International Railway, Buffalo, are reported in newspaper dispatches from Washington to have been abandoned. The reported plan to take over the electric lines was said to be part of the proposed railway mergers in the East and Middle West involving several lines. The Erie is said to fear that any purchase of interurban electric lines by it as freight and passenger feeders would merely serve to intensify competition from motor carriers.

Governor of New York Signs "Death Avenue" Bill

Included in 99 bills signed on March 28 by Governor Smith were several important New York City measures. One is expected to pave the way for the elimination of "Death Avenue" on the west side of Manhattan. The first step toward the elimination of "Death Avenue" is expected to be brought about under Assemblyman Samuel Hofstadter's bill relating to the removal of grade crossings in New York City. Under this measure the city authorities will be able to negotiate with the New York Central Railroad for the elimination of the tracks on Eleventh Avenue and for the general improvement along the west side of New York City through which the tracks of the New York Central run.

Controversial Points Being Cleaned Up in Toledo

A new power rate for the Community Traction Company, Toledo, which will settle an issue at least four years old and result in a rebate of approximately \$150,000 to the company, with the effective rate based on consumption rather than on a theoretical demand, has been agreed upon by Commissioner E. L. Graumlich and David H. Goodwillie, member of the street railway board of control, representing the city, and R. E. Burger, representing Henry L. Doherty & Company, according to the report to Mayor W. T. Jackson.

The railway will make an effort to settle the back paving claim of \$185,000 and also go along with the city administration in its paving program for this summer.

On the other hand, the city will seek to pass legislation which will enable the company to control the bus operations within the city, extend lines by means of additional buses, and take over some existing lines.

The whole plan is to be worked out under the Milner ordinance with the idea of cleaning up controversial points and eliminating competition so that the railway may be operated at a profit and

gradually work out of the deficit accumulated in the last seven years. Sinking fund charges have ceased under the terms of the ordinance.

Appraisal Expenditures Under Fire in Indiana

Alleged practice of Indiana utilities of charging to operating expenses the sums incurred by audits, appraisals and attorney fees was attacked on March 23 by the Indiana Public Service Commission with the adoption of a resolution that in the future will force such expenditures to be made from the net income and paid from the utility's own pocket.

According to Calvin McIntosh, commissioner, the resolution is the result of a hearing he conducted recently in which an increase in rates was sought. He presented figures to show that attorneys fees charged in connection with the hearing, which continued about one day, amounted to \$3,000 for one firm, \$750 for another and \$350 for a third. In addition he said that although appraisals and audits of the property and books were made by the Public Service Commission engineers and accountants, owners of the company paid \$5,000 for an appraisal to one commercial engineer and \$500 to another and that \$750 was paid by the company for a separate audit of the books, besides that made by the commission's accountant.

Rerouting Plan Discussed in Baltimore

Rerouting of cars of the United Railways & Electric Company, Baltimore, Md., was discussed at length at a recent meeting of the special commission appointed by Mayor Broening. The result was the appointment of Dean J. Locke, of the United, and William G. Albrecht, a member of the City Council and sponsor of the suggested one-way street system, as a committee to work out the details of this part of the program for submission to the commission. The commission will report the entire one-way traffic subject to Mayor Broening and the City Council in the near future.

Jacksonville Paper Has New Growth After Seven Years

Because *Trollicar Topics* has become so popular with patrons of the Jacksonville Traction Company, Jacksonville, Fla., it has been increased in size from four to six pages. More space will now be devoted to informing the car riders of the problems of the company and other railway properties. The leaflet first appeared more than seven years ago. Since that time it has been explaining the operation of the company to its readers. Hundreds of letters have been received approving *Trollicar Topics* in its new form.

Reduced Fares on Pacific Northwest

Reductions in fares on the Pacific Northwest Traction Company, Seattle, Wash., are in effect on the routes between Seattle, Wash., and Vancouver, British Columbia, through Everett, Mount Vernon, Bellingham and Blaine, Wash., and New Westminster, British Columbia. The principal changes in fares are as follows:

Miles	Old Fares		New Fares	
	One-way	Round-trip	One-way	Round-trip
31 Between Seattle and Everett.....	\$0.75	\$1.30	\$0.75*	\$1.30*
70 Between Seattle and Mount Vernon.....	2.15	3.30	1.35	2.50
98 Between Seattle and Bellingham.....	3.00	4.65	1.95	3.65
157 Between Seattle and Vancouver.....	4.50	8.00	3.00	5.50
39 Between Everett and Mount Vernon.....	1.40	2.00	.75	1.40
67 Between Everett and Bellingham.....	2.40	3.25	1.35	2.50
126 Between Everett and Vancouver.....	4.00	7.07	2.85	5.30
28 Between Bellingham and Mount Vernon.....	1.00	1.35	.55	1.00
59 Between Bellingham and Vancouver.....	2.15	3.65	1.50	2.75

* No change.

Fares reduced proportionately are in effect between other points. These fares are put in for a trial period which expires June 15, 1928.

"Skip-Stop" Service Approved By Columbus Council

Inauguration of "skip-stop" service and establishment of all railway streets as main thoroughfares have been approved by the City Council of Columbus, Ohio. Opposition to the measures was offered by Councilman Worley, who contended that the main thoroughfare clause was a scheme of the railway to seek legal immunity from accidents.

The legislation would establish "skip-stops" in all parts of the city except in the downtown district, allow cars to operate at 25 m.p.h., in the outlying districts and require all vehicles to come to a full stop before entering or crossing streets with car tracks. The present speed limit in the outlying districts is 20 m.p.h. These changes in service had been requested by C. C. Slater, president and general manager of the Columbus Railway, Power & Light Company.

Columbia Now Served by Buses

The transportation situation in Columbia, S. C., in more or less of a muddle since the cars of the Columbia Railway, Gas & Electric Company stopped running in March, 1927, bids fair to be cleared up in the near future. At the present time the city is being served by the Columbia Bus Company, a concern which has in operation nine 16-passenger Studebaker machines, with ten additional buses expected about the middle of April; also in operation are a number of unregulated 10-cent jitneys.

An ordinance has been passed by the City Council effective this month which provides that all motor vehicles operated for hire shall run on prescribed routes fixed by the City Council. A similar ordinance was passed several months ago. A jitney driver who violated it was technically placed under arrest, and

the case taken direct to the State Supreme Court to determine the constitutionality of the ordinance. Since that time, however, the General Assembly of the state has met, and it passed an act which specifically gave the Columbia Council authority to regulate motor traffic on the city streets. As a result of this act the case before the Supreme Court was dismissed before a decision was handed down. It is not believed that the jitneys' union will contest

this second ordinance, passed since the General Assembly passed its measure authorizing the Council to regulate motor transportation.

A municipal campaign late this month for the election of two members of the City Council is now in progress. At the various meetings the transportation situation has come in for much discussion.

Petitioners Ask for Referendum on Chicago Traction Legislation

Petitions signed by nearly 400,000 Chicago voters were filed at the election commissioners' office on April 6 asking that three questions of public policy regarding the city's railway problem be submitted to a referendum of the voters at the judicial election on June 4. Circulated under the auspices of the Amalgamated Improvement Association, these documents seek to make it compulsory upon Mayor Thompson and Governor Small of Illinois to submit all railway legislation for Chicago to the voters before it can become effective; they ask that voters be given an opportunity to determine whether the traction fund of \$50,000,000 shall be used to build a "loop" subway, and also whether the city should not at once provide buses for districts now without adequate transportation.

In explaining why the petitions were filed, August Knickels, president of the association, stated that Governor Small had been in office for seven years and Mayor Thompson for nine years, during which time they have both refused to give Chicago home rule.

Richmond to Journal Editor

"Transportation in Richmond Yesterday and Today" is a feature article in the March issue of *Richmond*, by G. Watson James, Jr., Assistant Editor, *ELECTRIC RAILWAY JOURNAL*. In this article Mr. James tells the story of transportation from the period of mule cars to the present-day riding on de luxe cars and buses.

Kip Stops Effective in St. Louis

Passengers on the Olive Street lines of the St. Louis Public Service Company have been saved six minutes on each trip following the installation of a kip-stop plan between Twelfth Boulevard and Channing Avenue, St. Louis, Mo. The limitation of car stops was suggested by Mr. Brooks, director of streets and sewers, to speed up the reconstruction and paving of Olive Street.

directorship was to give the city closer and more intelligent supervision of the company's operations and to make possible co-operation between the city and company for better service.

Mr. Knight went into considerable details concerning the simple, broad franchises granted to other utility companies in which he is interested and said that all the binding factors in a franchise may be placed on two sheets of paper. He said that all the Jacksonville company wants is "the right to live, a fair valuation of its property and a fair return on that investment." These were the only features necessary to put into a franchise, he declared.

Franchise at Jacksonville Still Under Discussion

The principles involved in the proposed new citizens' committee franchise for the Jacksonville Traction Company, Jacksonville, Fla., were discussed publicly at a recent meeting of the Council. There is still disagreement on some of the major points, but the consensus of opinion is that the matter is nearer a settlement now

"Above the Clatter of Wheels and the Hum of Motors"

A group of railway men attained the unusual distinction of furnishing music to the entire world on Saturday night, March 31, in a joint good-will program

noon and were the guests of the Pittsburgh Railways at luncheon and for an inspection trip of the system during the afternoon. At 6 p.m. the combined groups arrived by special street cars at the Westinghouse plant at East Pittsburgh and were the guests at a banquet and entertainment in the officers' dining room on the eleventh floor of their new office building.

The broadcast program was opened by a word of welcome from Thomas Fitzgerald, vice-president of the Pittsburgh Railways, to Col. Joseph Alexander, president of the Cleveland Railway. Other members of Mr. Alexander's staff present were Ralph W. Emerson, vice-president; Fred Bullock, assistant to the president; Clinton D. Smith, director of personnel, and J. H. Cox, superintendent of welfare. Members of Mr. Fitzgerald's staff present were J. B. Donley, director of public relations, and T. W. Noonan, general manager of the Pittsburgh Motor Coach Company.

Through a special set-up the broad-



A glimpse of those who made March 31 a gala event

can at any other time since the movement for a new 30-year permit was launched two years ago.

Representatives of the citizens' franchise committee, appointed by the Council to prepare a franchise, and Peter O. Knight, Tampa, general counsel for the company, discussed the proposed bill of privileges in detail. The Council finally voted unanimously to request Mr. Knight to prepare drafts of two franchises of different types that would be acceptable to his company. These drafts will be compared with citizens' committee plan for its final modification into an operating agreement that will be acceptable to both city and company.

Giles J. Patterson, local attorney, who was chairman of the citizens' committee, and George C. Bedell, attorney, spoke for the committee. Mr. Patterson opened the discussion with a review of the committee's work. He elaborated on the proposal to establish the office of city railway director, made in the drafted franchise, saying that the plan has been successful in other cities and that the sole purpose of the

furnished by employees of the Cleveland Railway and the Pittsburgh Railways and broadcast through the courtesy of radio station KDKA of the Westinghouse Electric & Manufacturing Company.

The Cleveland group included a 150-voice male chorus and a male octette, both under the direction of Charles Dawe, while the Pittsburgh contingent consisted of a 50-piece band under the direction of Alois Hrabak. The groups alternated on the air from 10 until 11:30 p.m. The program was sent out from KDKA over three wave lengths, 27, 62 and 316 meters, the low wave being used especially so that the 80-year old mother of Mr. Dawe might listen to the program at her home in Wales. This also was the official night KDKA broadcasts to the Far North.

In order that the home folks might hear the program from their local station a special line was maintained from KDKA to WTAM at Cleveland and the latter station rebroadcast the program from 10 until 11 p.m.

The Cleveland men arrived in Pittsburgh by special train Saturday fore-

cast of this exceptionally large group was made direct from the Westinghouse officers' dining room.

Paving Charges in Ogdensburg to Be Settled

Governor Smith has signed the Thayer bill, as chapter 577 of the laws of 1928, authorizing the city of Ogdensburg, N. Y., to enter into an agreement with the Ogdensburg Street Railway compromising, adjusting and settling all differences between the city and the railway for paving charges due the city.

Over the Waves With Williams on WJAR

Five minute talks are broadcast to the people of Rhode Island every Friday evening from station WJAR, Providence, by Alonzo R. Williams, general manager of the United Electric Railways, Providence, R. I., a shrewd observer of men and events, a wit and an unusually versatile forensic orator.

Recent Bus Developments

New Installation in Quincy On April 1

The Illinois Power & Light Company instituted bus service April 1 on the North Fifth Street line in Quincy, Ill., supplanting cars which have operated on that route 61 years. Bus service was also established from Tenth and Cherry Streets to the Soldiers' Home. The North Fifth Street line was the oldest car line in Quincy, the first section being built in 1867 when the Illinois Legislature awarded an exclusive privilege for operating horse-drawn cars over the street, giving a 50-year charter. Six new Yellow coaches have been installed for operation on the substitute service, each with 21-passenger capacity.

Would Consolidate Service in Section of Pennsylvania

The applications of the Johnstown Traction Company, Johnstown, Pa., for the right to purchase the controlling stock of the Southern Cambria Railway was heard by the Public Service Com-

mission on April 5 without protest. It was brought out in the testimony that the purpose of the consolidation was to co-ordinate the railway and the bus service operated by the two companies in that section of the state.

Files Protest Before Missouri Commission

D. L. Fennell, general superintendent of transportation of the Kansas City Public Service Company, has filed a protest with the Missouri Public Service Commission against the operation of proposed bus service connecting Kansas City, Independence and Odessa, by the Chicago & Alton Railroad.

He said his company had no objection to the railroad operating a bus line to Odessa as long as it did not carry passengers to Independence or from Independence to Kansas City. The steam railroad officials assert that the proposed service between the two cities has been necessitated as a matter of self-preservation against competing bus carriers.

Terms of New Louisville Grant

Twenty-year grant awarded to Louisville Railway. Initial fare 10 cents. Provisions of grant reproduced in detail

EXCEPT for the preamble the following are the terms of the franchise for the operation of buses in Louisville, Ky., awarded recently to the Louisville Railway following its successful bid for the grant:

SECTION 2—FRANCHISE CREATED

There is hereby created and established a franchise or privilege to operate gasoline buses, or other automotive vehicles, for the carriage of passengers for hire upon and over all the streets and highways of Louisville upon the terms and conditions hereinafter set out.

SECTION 3—OPERATING RESTRICTIONS

The enjoyment of the franchise grant hereby created shall be subject to the following conditions:

1. All operations hereunder shall be conducted according to established schedules over regular routes and between fixed termini;
2. Any route within the limits of this grant may be established, modified, discontinued, or re-established with the consent of the Board of Public Works of Louisville; but not otherwise;
3. The said Board may require the discontinuance of any route established hereunder;
4. The said board shall have power to require the establishment and operation by the holder hereof of such transportation routes upon any of the streets of Louisville, and to require such additional service upon any established route or routes, or modification thereof, as may be reasonably necessary to furnish adequate and a complete transportation service, provided, however, that said board shall first make,

or cause to be made by such city agencies as it may designate, a survey of each proposed route or additional or modified service, which survey shall include a report on the patronage to be expected, the desirability of and the reasonable necessity, if any, for such new route or routes, or additional or modified service;

5. If it shall be held by any court of last resort, having jurisdiction, that any of the said powers hereunder enumerated may not lawfully be vested in and exercised by the Board of Public Works, then such of said powers shall be vested in and exercised by the legislative department of the city of Louisville, it being the intent and purpose of this ordinance that all of said powers to be exercised hereunder by the city of Louisville shall be vested in and be exercised by whatever department of the government of the city of Louisville may lawfully exercise the same.

SECTION 4—DURATION OF FRANCHISE

The said franchise or privilege shall continue for a period of twenty years from and after the approval of this Ordinance.

SECTION 5—RATE OF FARES

The holder of this franchise may charge and collect toll during the first year of operation hereunder at a rate not exceeding 10 cents for each passenger carried within the city limits, with free transfers between bus lines in the making of a single continuous trip. Transportation of school children shall be furnished at one-half fare and to policemen, firemen and park guards, when in uniform, free.

Provided, first, that if this franchise be acquired by a person or corporation operating, in Louisville, a system of electrically propelled street cars running on rails, or

by a subsidiary of such corporation, then such person or corporation shall furnish free and reduced fare transportation hereinbefore set out and in addition shall give and receive transfers for the making of a single continuous trip within the city limits upon terms as follows: From bus line to bus line, and from bus line to electric car line, free; and from electric car line to bus line for not more than the differential between electric car fare and bus fare. The bus fare for the first year of operation shall not exceed 10 cents, and shall thereafter be controlled in the same manner and upon the same principles as the electric car fare, and

Provided, secondly, that by whomsoever the franchise may be acquired, in the adjustment of bus fare, electric car fare and/or transfer rules and charges, the rate or rates for service shall be such as to yield to the holder hereof a reasonable return upon the fair value of its entire and combined properties used and useful, employed in its city transportation service.

SECTION 6—ASSIGNABILITY OF FRANCHISE

The holder of this franchise shall not sell or assign the same to any person or company engaged in competitive transportation, or about to engage in competitive transportation, in the city of Louisville, provided, that nothing herein shall prevent the said holder from mortgaging such franchise in connection with its other properties and rights.

SECTION 7—BOND

The purchaser or assignee of this franchise shall within 30 days of its acquisition, as approved by the General Council, deposit and maintain throughout the term of operation hereunder, with the Board of Public Works, a bond with corporate surety approved by said board, in the sum of \$100,000 running to the city of Louisville, conditioned as follows:

1. That the holder shall fulfill the obligations of this franchise during its entire life;
2. That in the event of any injury or damage to any person or property growing out of any negligence in the operation of the motor vehicles used by the franchise holder in the business herein, provided for, the person so injured in his person or property shall have a right of action thereon;
3. That said applicant will pay to the city of Louisville all sums due said city for any license, tax, or other liability, including all fines, and forfeitures assessed against such franchise holder by the final judgment of any court, and also to indemnify the city against any loss or damage for accidents arising out of negligence in the operation of such motor vehicles;
4. That said bond shall not be void upon first recovery, but may be sued on and recovery had until the full sum thereof is exhausted;

Provided: Should the holder of this franchise fail within 30 days from its acquisition to give bond, as in this section provided, or fail to make good any impairment in such bond within 30 days of such impairment, such failure in and of itself shall render this franchise void and of no effect, and no act or omission on the part of the city shall constitute a waiver. Approval by the Board of Public Works of bond of any holder hereof shall release all prior bonds except as to liabilities then outstanding against said prior bonds, or any of them.

SECTION 8—ADVERTISEMENT

SECTION 9—UPSET BID

In the sale of this franchise the Board of Public Works shall offer the same at an upset bid of \$5,000.

SECTION 10—PAYMENT AND DEPOSIT OF CERTIFIED CHECK

The bidder to whom such franchise or privilege shall be awarded shall pay the amount of such bid in cash to the treasurer of the said city within ten days after the same shall have been approved by the General Council, and no bid shall be received or considered by the said Board of Public Works unless such bidder shall deposit with his bid a check, payable to the treasurer of the said city, for the sum of Five Thousand (\$5,000.00) Dollars, and which shall have been duly certified by a bank established and doing regular business in the city of Louisville, and which sum of money shall be treated as part of payment by the successful bidder, in case he shall comply with his bid; and if he shall not, it shall be treated and retained as liquidated damages due to the said city. Checks deposited by unsuccessful bidders shall be at once returned to them respectively.

SECTION 11—SUPERVISING DUTIES OF BOARD OF PUBLIC WORKS

The Board of Public Works shall perform the duties herein imposed upon it of supervising the management of the operations of the holder hereof. To enable the said board to perform such supervisory duties, such technical and engineering force, auditors, accountants, inspectors and clerks may be employed as the General Council may, by ordinance, from time to time authorize; the said appointees and assistants to be named by the Mayor by and with the approval of the General Council.

SECTION 12—ACCOUNTS AND ACCOUNTING RECORDS

The Board of Public Works, or such other person or persons as may be authorized or delegated by said board or said city, shall have access to all books, records, correspondence, files, engineering studies, data and all other recorded information of any kind or character whatsoever kept by the holder of this franchise, however and in any way relating to the affairs of the said holder, past, present or future, and refusal to permit such access shall bring said company in default under the penalty clause hereinafter set out.

The accounts of the said holder shall be kept in accordance with the uniform classifications of accounts for Class A bus companies as from time to time prescribed and promulgated by the National Association of Railroads and Utilities Commissioners, unless the Board of Public Works shall from time to time agree with the said holder to modify such system of accounting.

Under the system of accounting then in force, the said holder shall render to the Board of Public Works complete monthly statements in writing.

SECTION 13—PENALTY CLAUSE

In the event the holder of this franchise knowingly fails or refuses to abide by the terms of this ordinance, or any one or more of them, or the terms of any ordinance or resolution passed pursuant to the provisions of this ordinance, it shall be subject to a fine of not less than \$50 nor more than \$100 for each offense, and each day's failure or refusal shall constitute a separate offense.

Whenever any penalty is imposed under this section, same shall be paid by the said holder out of corporate funds, and shall not be charged as an operating expense.

Nothing in the ordinance shall be deemed to barter away or to impair the police or rate-making powers of the city of Louisville, but on the other hand, the city ex-

pressly retains these powers free and unimpaired. The General Council shall exercise free and unimpaired its police powers in respect of the kind and character of service to be rendered under this franchise.

The sale of the franchise to the railway company has been approved by the Council.

The Louisville Railway has 30 buses ready to place in service under the new

bus franchise, but for the present will require only 20 of them.

James P. Barnes, president of the railway, has announced a new fast light-freight service between Louisville and Lexington. Buses of the company will carry freight from end of the electric line of the company at Shelbyville to the beginning of the electric line operating between Frankfort and Lexington.

Hearing on Interstate Bill

Various interests advocate passage of regulatory measure declared to represent joint views of state commissions and of operators

REPRESENTATIVES of bus operators and of state public utilities commissioners testified on April 10 at a hearing before the House Committee on Interstate and Foreign Commerce, in support of the bill (H. R. 12380) introduced by Representative Parker, of New York, chairman of the committee, to provide a system of federal regulation of interstate operations of motor vehicles carrying passengers as common carriers.

S. A. Markel, chairman of the legislative committee of the bus division, American Automobile Association, and John E. Benton, of Washington, general solicitor, National Association of Railroad and Utilities Commissioners, explained that the Parker bill represents a much simplified and shortened redraft of the earlier Parker bill, on which they and other organizations interested had collaborated, and that it had been presented in an effort to obtain legislation at this session.

The new bill does not apply to truck operations. Mr. Benton attributed the origin of the new bill largely to Mr. Markel's organization, although he said it had been generally approved by others, and that his association, through its officers and committees, had expressed approval, as far as the bill goes, without changing their attitude represented in the earlier bill.

Counsel for the American Railway Association and the American Short Line Railroad Association, representing the steam railroads, and of the American Electric Railway Association, also were present to give their views.

Mr. Markel said that at conferences between those he represented and the public utilities commissioners and railway interests, it was agreed that the bill is in the public interest, although bus owners were not unanimous in approving all the terms of the bill. He explained that the bill would provide for actual regulation to be administered in the first instance by joint boards of state commissioners, which appeal to the Interstate Commerce Commission.

Mr. Markel said that 44 states have regulatory laws governing intrastate operations of motor vehicles and that the bus operators have confidence in the state commissions. The language of the bill he said follows state regulatory procedure as far as possible. An attempt has been made to simplify the bill

by leaving the machinery of regulation as far as possible to the commissions. The bill is not intended to cover "contract carriers," such as sightseeing buses that make contracts with parties for special trips.

Mr. Benton said the organization of the state commissioners had been interested in legislation of this character ever since March, 1925, when the Supreme Court of the United States held that no state could restrain operations of vehicles in interstate commerce, which left about 10 per cent of the motor traffic beyond the state jurisdiction.

F. T. Singleton, chairman of the Public Service Commission of Indiana, made a brief statement, saying Indiana is especially interested in the bill because much motor traffic passes through that state.

Representative Wolverton said that an intolerable situation had been created as the result of the great increase in the volume of interstate passenger bus traffic over the bridge between Philadelphia and Camden, which now amounts to over 280 buses a day, and that the New Jersey municipalities are greatly handicapped by lack of power to regulate interstate operations. He therefore urged that action be taken at this session if at all possible.

Rehearing Granted in Staten Island Case

A rehearing will be held on April 23 by the New York State Transit Commission on the application of the Tompkins Bus Corporation for certificates of convenience and necessity for the operation of buses on eighteen routes in the Borough of Richmond (Staten Island) specified in the contract of franchise between the city of New York and the bus company dated Aug. 4, 1927. The grounds on which the commission acted in its previous refusal to approve the appeal of the company were reviewed in the *ELECTRIC RAILWAY JOURNAL* for March 10, page 416. Any action the state body may take in the matter is regarded as important since it may be considered as defining the attitude of that body as contrasted with that of the city in the matter of passing on the competency of operators seeking bus rights that might result in competition with existing carriers.

Financial and Corporate

Cortland County Traction Sought by Power Interests

Application has been made to the Public Service Commission of New York State by the Mohawk Hudson Power Corporation for consent to acquire more than 10 per cent of the capital stock of the Cortland County Traction Company, Cortland, N. Y., which operates 18 miles of electric railway, runs bus routes and does a lighting and power business. The capital stock of the Cortland Company consists of 3,200 shares, par value \$100.

The petition of the Mohawk Hudson Company states that an agreement has been reached between all the owners of capital stock of the Cortland Company and the Mohawk Hudson Company for exchange of the stock of the Cortland Company for certain stock of the Mohawk Hudson Company on the following basis:

For each share of the capital stock of the Cortland County Traction Company one share of the preferred stock of the Mohawk Hudson Company, 2½ shares of the second preferred stock and six shares of the common stock. The shares to be exchanged are without par value. The preferred stock is entitled to cumulative dividends at the rate of \$7 a share per annum and the second preferred stock at the rate of \$7 per annum after payment of dividends on the preferred stock.

Sale of Equipment Trust Stock Approved

A compromise sale price of \$45 net on preferred stock of the Indianapolis & Cincinnati Car Trust Equipment Company is reported to have been agreed on between a stockholders' committee and representatives of the Indianapolis & Cincinnati Traction Company. The agreement will permit Charles T. DeHore and L. E. Eastman, prospective owners, to proceed to improve the road and possibly extend it.

Terms of the agreement have received the approval of Judge Robert C. Baltzell in federal court to the extent that the receivership action will be continued while the plan is being worked out. Letters are to be mailed shortly to holders of the equipment company's series A preferred stock inviting them to deposit their stock with the Fletcher Savings & Trust Company, Indianapolis, for sale to the DeHore and Eastman interests.

Before the compromise, DeHore and Eastman, it was reported, had offered stockholders \$33.50 a share, or one third of the face value of the securities. This offer has stood for some weeks, with the representatives of the inter-urban asserting they would provide the road with entirely new equipment rather than pay more for the stock.

Members of the stockholders' com-

mittee said the price of \$45 net to be paid under the agreement was more than they might hope to realize if the equipment being used on the lines was withdrawn and sold at its depreciated value. In this instance the equipment trust was somewhat unusual in that it covered rolling stock and certain power installations pledged some years ago when the road changed from single-phase to high-voltage direct current.

Buffalo Company Certifies Change in Capital

The International Railway, Buffalo, N. Y., has notified the Secretary of State of an increase in authorized capital stock to 195,000 shares from 175,000 shares. New capital will consist of 20,000 shares of \$100 par preferred stock and 175,000 shares of no par common stock. Present authorized capital consists of 175,000 shares of \$100 par capital stock. The change which has now been certified to the state has been the subject of extended comment in previous issues of the ELECTRIC RAILWAY JOURNAL.

Net Income Increases

Trustees of the Eastern Massachusetts Street Railway report an increase of \$37,222 in net income of company. Operating expenses decreased. Company active in promotion of new business

THERE was a decrease of \$162,601 in revenue from all sources of the Eastern Massachusetts Street Railway, Boston, Mass., in 1927, compared with 1926. The net income available for dividends in that year was \$772,060, an increase over 1926 of \$37,222. This fact was disclosed in the annual report of the company's trustees for the year ended Dec. 31, 1927. Unfavorable weather conditions were almost entirely responsible for the large decrease in revenue. The railways revenue would have shown a greater decrease except for an active campaign to promote more business by the introduction of a dollar Sunday and holiday ticket in July, 1927, and the addition during the summer of 50 new de luxe light-weight cars. The cost of the 50 new cars was \$778,000. During the year 241 cars were reconditioned and 537 cars repainted.

Total passenger miles operated in 1927 were 17,912,322, as compared with 17,731,483 in 1926.

The cost of operation before taxes, interest, and rental charges was \$169,412 less in 1927 than in 1926. The reduction in expenses would have been greater except for an increase in wages of 1½ cents an hour, effective May 2, 1927, under an agreement with the union. The actual expenditures for maintaining passenger cars were \$514,845, compared with \$422,585 in 1926. The activities of the rolling stock department in 1927 were devoted mostly to improvement of passenger car equipment. The work in this department and the increased rate of wage are the real causes of the larger operating expense. There was an increase in the cost of group insurance due to the employment of a larger number of men under the enforced change from the nine-hour day to the eight-hour day.

During the year the company rebuilt 14.5 miles of track, of which 9.7 miles were in paved streets. As a result of the continued intensive supervision and improvement on rails, derailments due to defects in the track during 1927 were

only one-fourth of those in 1922, and were 22 per cent less than in 1926.

On the subject of bus operation, the report said that 1,435,817 bus-miles were operated in 1927, an increase of 148,650 over 1926. All of the bus lines operated in 1926 were continued in 1927, and in addition a bus line was started between Lowell and Lawrence by a new route south of the Merrimac River. This line replaces a local trolley line in Lowell, and also serves new territories in Tewksbury and Andover. Bus revenues for the entire system increased \$60,058, and expenses increased \$15,697. During the year the company failed, however, to earn bus operating expenses and depreciation, not including taxes and interest, by \$24,900, compared with a loss of \$62,207 in 1926. Ten motor coaches were purchased at a cost of \$89,290. At the present time the bus investment is \$538,482. The buses are operated in 26 towns and cities. To aid in snow fighting on bus lines, three caterpillar snow plows were purchased during the year at a cost of \$14,100. There are now 23 bus snow-fighting units on the system.

Dividend payments amounting to \$866,201 were made in 1927 as follows:

First preferred.....	\$248,013
Sinking fund.....	1,260
Preferred B.....	181,368
Adjustment.....	435,560
	\$866,201

Under the group insurance and pension plan, insurance policies aggregating \$40,700 in eighteen death cases, and monthly allowances to pensioners were paid during the year aggregating \$22,242. Twenty-seven other employees are receiving monthly payments under the total disability clause of the insurance plan. Six new pensioners were added in 1927 and four died. The total is now 39.

On the first preferred and sinking fund stocks, payments of 3 per cent were made on Feb. 15 and Aug. 15. On preferred B, payments of 3 per cent were made on Feb. 1 and Aug. 1. On adjust-

COMBINED INCOME STATEMENT OF ALL DISTRICTS OF EASTERN MASSACHUSETTS STREET RAILWAY

	1927	1926
Street car revenue.....	\$8,472,602	\$8,699,914
Auto bus revenue.....	381,375	321,317
Express and other revenue.....	36,773	41,879
Rentals and advertising.....	190,171	198,051
From sale of power.....	262,275	272,527
Interest and other income.....	282,238	254,347
Total revenue.....	\$9,625,434	\$9,788,035
Expenses:		
Way and structures.....	\$1,221,227	\$1,229,616
Equipment.....	1,240,498	1,230,046
Power.....	1,270,720	1,281,790
Car operation.....	2,249,449	2,378,475
Injuries and damages.....	252,050	262,166
Insurance.....	73,003	73,810
Law expenses.....	15,217	40,255
Roof of tracks.....	82,382	80,167
General wages and expenses..	241,583	235,724
Pensions.....	22,242	23,045
Group insurance.....	69,314	64,866
Stationery and printing.....	33,917	37,201
Stores and garage expenses...	56,652	53,299
Miscellaneous expenses.....	45,307	68,210
Auto bus expenses.....	399,221	383,524
Total operating expenses.....	\$7,272,782	\$7,442,194
Total operating expenses and taxes.....	\$7,631,676	\$7,807,332
Gross income.....	1,993,758	1,980,703
Interest and rentals.....	1,221,698	1,245,865
Net income.....	\$772,060	\$734,838

Operating expenses include charges for depreciation amounting to \$848,467 in 1927 and \$917,940 in 1926. During the year 1927, \$616,463 of the depreciation reserve was applied to reconstruction and amortization.

ment stock, payments of 2½ per cent were made on April 1 and Oct. 1.

Bonded obligations of the company were retired and paid at maturity as follows: \$129,000 Bay State equipment 6's due Aug. 1, 1927; \$300,000 Eastern Massachusetts series A 6's due Jan. 1, 1928; \$105,000 Eastern Massachusetts series C 6's due Feb. 1, 1927; \$107,400 Eastern Massachusetts series C 6's due Sept. 15, 1927; and \$64,000 Peoples Street Railway 5's due Jan. 1, 1928.

The final serial payment of \$129,000 of Bay State equipment 6's was made on Aug. 1, 1927. These ten-year serial 6 per cent gold notes were issued by the Bay State Street Railway on Aug. 1, 1917, to cover in part the cost of 200 Laconia semi-convertible cars, on which a cash payment of \$323,000 was made at the time of the purchase, the total cost being \$1,631,000, and the original issue of notes \$1,308,000, of which the unpaid principal amounting to \$1,177,000 was assumed by the Eastern Massachusetts Street Railway at the time of the reorganization.

Items showing decreases in revenue were:

Street car revenue.....	\$227,312
Express and other revenue.....	5,106
Rentals and advertising.....	7,880
Sale of power.....	10,252

Items showing revenue increases were:

Auto bus revenue.....	\$60,058
Interest and other income.....	27,891

Principal increases in expenses were:

Equipment.....	\$10,452
Roof of tracks.....	2,215
General wages and expenses.....	5,859
Group insurance.....	4,448
Stores and garage expenses.....	3,353

Principal decreases in expenses were:

Way and structures.....	\$8,389
Power.....	11,070
Car operation.....	129,036
Injuries and damages.....	10,016
Law expenses.....	25,038
Stationery and printing.....	3,284
Miscellaneous.....	22,903

J. F. Collins Made Receiver of Detroit-Jackson Line

John F. Collins, vice-president and general manager of the Michigan Electric Railway Lines, Jackson, Mich., has been appointed receiver for the Detroit, Jackson & Chicago Railway, succeeding A. L. Drum. The company he will now direct operates the interurban line connecting Jackson, Ann Arbor and Detroit.

The Jackson-Detroit line certainly would appear to be more naturally a part of the Michigan Electric Railway system than the Detroit United Railway group with which it has been connected in the past. Under his new receivership, Mr. Collins contemplates operating through passenger cars from Kalamazoo to Detroit without transfer at Jackson. Other improvements in through service probably will be instituted as a result of the new arrangement.

Receiver in Charge of Puget Sound Electric Railway

The Puget Sound Electric Railway, Tacoma, Wash., is now under the direct operation of Scott Z. Henderson, local attorney, as receiver, as a result of a cancellation of the contract of Stone & Webster, Inc., Boston, effected recently under authorization of Judge Edward E. Cushman of the United States District Court. The petition for cancellation was filed in the court by the receiver. No immediate changes in the road organization will be made.

The interurban line went into receivership on Feb 21 this year, and until now its affairs have been administered by Stone & Webster, its operating managers for the last 25 years. The action in no way affects the control and operation of the Tacoma Railway & Power Company, owned by the Puget Sound electric road, this remaining in the hands of the Boston corporation.

The circumstances surrounding the affairs of the Puget Sound Electric Railway were reviewed at length in ELECTRIC RAILWAY JOURNAL for July 30, 1927, page 209.

New Member Elected

At the recent directors' meeting of the Philadelphia & Western Railway, Norristown, Pa., Archie D. Swift was elected an additional member of the executive committee.

Bondholders of New York Interurban Ready to Act

Holders of the first mortgage 5 per cent gold bonds of the Syracuse, Lake Shore & Northern Railroad, Syracuse, N. Y., due May 1, 1947, are advised that the protective committee now has a majority of the bonds of the company and is about ready to take possession of the road for the bondholders through foreclosure proceedings. Those who have not yet deposited their bonds are urged to do so at once.

In 1927 the road showed earnings of

\$44,933 before bond interest requirements, but after depreciation of \$16,266 and after taxes.

The bondholders are urged to exercise their right to take over the road since there is apparently a definite earning power in the main property. The committee says that it "desires to accomplish the best results possible for all of the bondholders and thinks that it will be to your best advantage to deposit your bonds with it and participate in a reorganization of the property rather than merely to take your proportionate share of the price which may be bid for the property upon a foreclosure sale."

\$1,372 Net Income in Detroit in February

In presenting the financial statement of the Department of Street Railways of Detroit, Mich., for February, 1928, and for the year ended Feb. 29, 1928, William M. Hauser, auditor for the department, included a statement officially presented to the administrative officers of the city of Detroit, in part to show the position of the auditor and also to make it clear that the accounts of the department have been kept in accordance with scientific practice.

The balance of net income for the month of February, 1928, is \$1,372 after the payment of sinking fund charges. This shows a decrease of \$42,017 compared with a similar month in 1927. The semi-annual interest payment on certain of the construction bonds was made on Feb. 15, 1928, in the amount of \$55,000. At the end of the month \$173,224 was paid covering the 23rd quarterly interest payment in the unpaid balance of the purchase contract with the Detroit United Railway. This brings the total amount so paid out for interest under the terms of the contract to March 1, 1928, to \$5,005,015. Not one cent of this money has been contributed by the taxpayer, it is pointed out by the auditor. It has all come out of the rate of fare.

The auditor refers to a report by Price, Waterhouse & Company, dated Nov. 29, 1927, with respect to the audit of the accounts of the Detroit Street Railways for the year ended June 30, 1927, in which it is stated "as pointed out in our previous reports it is to be regretted that a more specific statement as to what was to be contained in the expression 'fixed charges' was not set forth in the charter, especially with regard to the element of depreciation. From an accounting standpoint depreciation is generally considered as a fixed charge, so that from the standpoint the city charter requires that the rate of fare shall be sufficient to cover both the elements of debt requirement and depreciation."

The auditor of the department does not agree with the standpoint taken by Price, Waterhouse & Company in several respects and suggests that on account of the different views with respect to depreciation it would seem that the corporation counsel should be asked to give an opinion as to just what is meant

by the section in the city charter under fixed charges. The auditor states that if this opinion is given it will clear up the much-discussed difference in the reports, namely \$1,283,159, which Price, Waterhouse & Company, claim has not been provided for in the accounts of the department for the year ended June 30, 1927.

Under date of Feb. 21, 1928, or practically eight months after the close of the fiscal year ended June 30, 1927, the auditor received from Price, Waterhouse & Company, so-called audit adjustments in connection with the accounts of the department at June 30, 1927. The auditor states that he is now engaged in auditing and checking these adjustment items.

Quebec Company Reported in Deal

Shareholders of the Quebec Railway, Light, Heat & Power Company have approved the sale of the company as a going concern to the Quebec Power Company. The price obtained is sufficient to discharge all outstanding obligations of the company, including principal, interest and redemption premium of outstanding bonds, including all outstanding bonds of Quebec-Jacques Cartier Electric Company, the properties and assets of which are to be taken over by Quebec Railway, with the purchase price sufficient to enable the company on liquidation to pay to all holders of the company's outstanding common shares a sum of \$80 in cash.

Homestead Line Bought by Pittsburgh Railways

Purchase of the Homestead & Mifflin Street Railway, Homestead, Pa., has been made by the Pittsburgh Railways. The lines were taken over April 1. They include 3 1/4 miles of track, overhead lines, and eleven street cars.

The new owner of the line has filed with the Public Service Commission a petition asking permission to charge the usual rate of fare, 10 cents, with three checks for a quarter, in addition to granting transfer privileges which patrons of the line do not have at present. The present fares will remain until the commission renders its decision.

\$126,014 Available on Petaluma Line for All Changes

The Petaluma & Santa Rosa Railroad, operating in Petaluma to Sebastopol and Santa Rosa, Cal., reports to the Railroad Commission its 1927 operating revenue at \$561,474, compared with \$579,119 for 1926. Operating expenses, excluding taxes for 1927, are \$417,212, and \$426,257 for 1926, leaving net operating revenue of \$144,261 for 1927, and \$152,861 for 1926. During 1927 taxes charged to operation amounted to \$32,746, and for 1926 to \$34,394. Deducting the taxes leaves operating income of \$111,514 for 1927, and \$118,466 for

1926. Adding to the operating income, the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income (which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus) of \$126,014 for 1927, and \$125,607 for 1926.

Penn-Ohio and Northern Ohio in Deal

A special meeting of Penn-Ohio Edison stockholders has been called for May 1 to ratify an exchange offer to stockholders of the Northern Ohio Power Company, according to which two-thirds of a share of Penn-Ohio Edison common stock plus an option for an additional one-third share will be

issued in exchange for each share of Northern Ohio Power common stock. The options will entitle the holder to purchase Penn-Ohio Edison common at a rate of \$50 a share until Dec. 31, 1928, at \$55 in 1929, and at \$60 thereafter until Nov. 1, 1935.

The Northern Ohio Power Company owns more than 99 per cent of the common stock of the Northern Ohio Power & Light Company, which has assets in excess of \$55,000,000 and operates electric light and power properties in Akron, Canton and Massillon, Ohio, and electric railways and bus systems in northern Ohio with trackage entrance rights into Cleveland.

The Penn-Ohio Edison Company controls a group of companies supplying the entire electric light and power, street and interurban railway business in eastern Ohio and western Pennsylvania.

\$258,158 Net in San Francisco

This figure was carried to surplus of the Market Street Railway after 1927 operation. Many improvements in effect and accidents reduced. Funded debt being reduced steadily

TOTAL operating revenue of the Market Street Railway, San Francisco, Cal., was \$9,819,570 for the year 1927, a decrease of \$72,097 compared with 1926. The decline in passenger receipts was due to unemployment, increased use of automobiles, and particularly to easier egress from the city on account of increased ferry service, especially noticeable during the week-ends. For the greater part of the year the number of unemployed approximated 30,000, as the result of reduction in building and manufacturing activities. This explanation was made in the annual report of the company.

Operating expenses, including taxes, were \$8,245,858, an increase of \$226,764 over 1926, due to an increase in wages of employees, to better maintenance of equipment and to increased

cost of efforts to obtain new business. The wage increase became effective March 1, 1926, and consequently, for purposes of comparison, the first two months of this expense for that year were correspondingly larger than the similar two months of the preceding year.

The net operating revenue was \$1,573,712, while the sum of \$258,158—after allowance of \$500,000 for depreciation reserve—was carried to surplus, making a total of \$3,426,793 for this account as of Dec. 31, 1927. The funded debt of the company in the hands of the public was reduced from \$11,695,000 to \$11,001,500, a decrease of \$693,500, which amount represents bonds acquired for the sinking fund and treasury. The sinking fund provision in the trust indenture securing the bonds requires that \$500,000 be deposited with the trustee annually at the rate of \$125,000 quarterly. These funds are used to purchase bonds and, when so acquired by the sinking fund, such bonds remain alive and continue to draw interest for the retirement of additional bonds.

The sum of \$671,390 was expended for the maintenance of ways and structures, and \$691,269 for the maintenance of equipment. A new line was opened and an additional bus line was established. As a means of increasing traffic on Sundays the Sunday Pass system was installed Oct. 30, selling at 20 cents for unlimited rides for the day.

Education of the public, through the children, to the efforts of the company to improve service in every way has been given much consideration. A special "Comfort Car" (formerly the president's car) was dedicated to school and other deserving children and put into service with a view of

OPERATING STATISTICS OF THE MARKET STREET RAILWAY FOR THE YEAR ENDED DEC. 31, 1927

Passengers carried:	
Cash fares 5 cents each.....	192,792,769
Special car passengers.....	14,750
School and other tickets, 2 1/2 cents each.....	3,721,267
Other tickets 5 cents each.....	27,211
Total revenue passengers.....	196,555,997
Free transfer passengers.....	67,111,448
Total revenue and transfer passengers.....	263,667,445
Free passes.....	518,073
Total passengers.....	264,185,518
Percentage of transfer passengers to revenue passengers.....	34.14
Passenger revenue per revenue and transfer passenger in cents.....	3.72
Car-hours.....	2,978,282
Car-miles.....	26,666,192
Miles of single track operated.....	270.59
Miles single track leased.....	17.59
Miles of single track owned.....	253.69
Number of passenger cars owned.....	776

PERCENTAGE OF OPERATING REVENUE	
Operating expense.....	77.81
Taxes (railway only).....	6.16
Operating expense and taxes.....	83.97
Operating income.....	16.03
Non-operating income.....	.42
Gross income.....	16.45
Deductions from income.....	13.81
Net income.....	2.64

REPORT OF MARKET STREET RAILWAY
FOR THE YEAR ENDED
DEC. 31, 1927

Operating revenues:		
Passenger.....	\$9,740,296	
Other.....	79,274	
Total.....		\$9,819,570
Operating expenses and taxes:		
Operating expenses:		
Maintenance of way and structures.....	\$671,390	
Maintenance of equipment.....	691,269	
Power.....	1,360,576	
Transportation and traffic.....	3,979,313	
General and miscellaneous.....	938,310	
Total.....	\$7,640,858	
Taxes.....	605,000	
Total.....		8,245,858
Net operating revenue before provision for depreciation.....		\$1,573,712
Other income credits:		
Interest.....	\$23,680	
Other.....	17,201	
Total.....		40,881
Gross income.....		\$1,614,593
Income charges:		
Interest on funded debt....	\$790,534	
Discount on funded debt....	50,641	
Depreciation of railroads and properties.....	500,000	
Other.....	15,290	
Total.....		1,356,435
Net income for the year.....		\$258,158
Surplus, Jan. 1, 1927.....		3,220,041
Profit and loss credit—cancellation of provision for 1926 federal income tax ..		74,424
Gross surplus.....		\$3,552,623
Profit and loss charges:		
Net adjustment of discount on funded debt on bonds retired.....	\$27,731	
Management services applicable to prior period.....	95,833	
Miscellaneous.....	2,264	
Total.....		\$125,830
Surplus Dec. 31, 1927.....		\$3,426,793

Delaware & Hudson Subsidiaries
Report

Operating revenues of the United Traction Company, Albany, N. Y., from all sources, during 1927, were \$2,738,184; operating expenses \$2,303,852; and taxes \$172,500. Operating income was \$261,832 compared with \$349,515 in 1926, a decrease of \$87,683. Operating revenues decreased \$195,338, or 7 per cent, compared with the preceding year. Operating expenses decreased \$67,055, or 3 per cent, and taxes decreased \$40,600, or 19 per cent.

Among the items of decreased operating expenses were: maintenance of roadway, power plant, and substation structures, \$3,415; cost of removing snow and ice, \$27,564; cleaning and sanding tracks, \$6,956; maintaining equipment (other than depreciation and retirements), \$31,641; transportation expenses, \$64,572; and injuries and damages (including public liability insurance), \$46,382. These decreases were partly offset by increases in track and roadway labor, \$18,135; track and roadway materials, \$12,868; paving, \$39,439; maintenance of electric distribution and transmission systems (other than structures), \$1,929; depreciation of equipment, \$1,094; equipment retirements, \$21,438; power purchased, \$4,501; and general and miscellaneous expenses, excluding injuries and damages and public liability insurance, \$14,241.

Effective on July 1, 1927, the Public Service Commission authorized an increase in fare from 7 cents to 10 cents cash, with thirteen tokens for \$1 (50 cents for school children).

Operating revenues of the Hudson Valley Railway during 1927 were \$620,849; operating expenses \$791,530; and taxes \$46,500. There was an operating deficit of \$217,181 for the year, comparable with a deficit of \$64,759 in 1926. Operating revenues decreased \$152,550, or 20 per cent, below the preceding year; operating expenses increased \$4,222, or half of 1 per cent; and taxes decreased \$4,350, or 9 per cent.

Effective on Dec. 31, 1927, the Public Service Commission authorized the abandonment of branch lines between Thomson and Greenwich and between Lake George and Warrensburg. Application has been made to the Public Service Commission for permission to abandon the line between Stillwater and Fort Edward, and depot line, belt line, and South and Knight Streets line in Glens Falls.

Operating revenues of the Capitol District Transportation Company, Inc., the bus operating subsidiary of the United Traction Company in Albany and vicinity, during 1927, were \$583,708; operating expenses \$583,856; and taxes \$5,000. There was an operating deficit of \$5,148 for the year, comparable with a deficit of \$52,291 in 1926. Operating revenues increased \$280,057, or 92 per cent; operating expenses increased \$230,506, or 65 per cent; and taxes increased \$2,408, or 93 per cent.

Four additional lines were established

during the year. Effective on Aug. 8, 1927, the Public Service Commission authorized increased rates of fare to equal rates authorized for United Traction Company lines.

Rate Fixing—What Constitutes Fair Value

I. Montefiore Levy, of the New York Bar, and formerly Commissioner of Education, has an article "Rate Fixing—What Constitutes Fair Value," in the *New York Law Journal* for March 24. It is a very interesting review of the situation, considering the limitations of the space it occupies. As Mr. Levy points out, almost a generation ago the United States Supreme Court held that, while the people could fix the rates, the railroads are public utilities and, although their property is charged with a public use, the rate must be reasonable, so as not to violate the constitutional prohibition against confiscation of property without reasonable compensation. At first, there was a long line of cases trying to define what was reasonable compensation and, in order to do that, one necessarily had to decide first what the value of the property was, and then the question arose, at what value the property should be taken, its value at the time of its production or its value at the time of the controversy.

According to Mr. Levy, while the court has laid down the doctrine of fair value, it has prescribed no definite rule by which to ascertain that value. Several lines of inquiry have been suggested that may be pursued, but the court, limited by human judgment, has wrestled and is still wrestling with the problem. After citing many of the so-called key cases, among them *McCardle vs. the Indianapolis Water Company*, he says that "from the determination reached in the *McCardle* case it can be surmised that the tendency of the Supreme Court of the United States is to place emphasis on reproduction cost as a basis for determining 'fair value,' and that it is disposed toward liberality in deciding what would be a reasonable return on such fair value."

Voting Trust Agreement for Omaha

Holders of all outstanding common and preferred stock of the Omaha & Council Bluffs Street Railway, Omaha, Neb., have been asked by a committee composed of Albert Strauss and Marshall S. Morgan, New York, and Fred Hamilton and Louis S. Nash, Omaha, to deposit their stock so a voting trust may be created composed of John N. Shannahan, Sidney W. Noyes, Edwin N. Sanderson, Albert Strauss and Fred Hamilton.

The committee reports that 95 per cent of the bonds, which fell due last January, are now in its hands pursuant to an agreement to extend them three years in order to allow President Shannahan a free hand in working out his plans for rejuvenation.

acquainting them with the details of street car operation and the mechanical features involved.

Twenty-six electric comfort cars of the latest improved pattern were built at the company's shops during the year. Considerable overhauling, rebuilding, remodeling and repainting jobs were accomplished. These many improvements, with others made in rolling stock, elicited much favorable comment from the public. The work of track improvement was continued, 0.467 mile of electric track (single track measurement) having been built and 6.667 miles of electric track rebuilt.

While the number of autos registered in San Francisco increased in 1927 over the year previous from 128,240 to 135,729, there has been a reduction in the number of accidents occurring during the year. The installation of "white fronts" upon the company's cars, has been an effective means of preventing collisions.

Discontinuance of Iowa Interurban

The Iowa Railway & Light Company has been authorized to discontinue its interurban line between Lisbon and Cedar Rapids, Iowa. By Aug. 1 the line will be dismantled according to Sutherland Dows, manager. Tracks in Mount Vernon will not be torn up.

Book Reviews

Car Builders' Cyclopedia

Simmons-Boardman Published Company, New York, N. Y. Twelfth edition. 1,200 pages. Price, \$5 cloth; \$7 leather.

This work is a complete summary of all details of rolling stock. Never before has the book been so completely revised nor more new material added than in this new 1928 edition, which is ready for delivery. It is the first edition of the Car Builders' Cyclopedia—the standard authority on steam railroad freight and passenger rolling stock—to be published since 1925. It, therefore, records the latest development in car design, maintenance practices and equipment.

The first edition of the Car Builders' Cyclopedia was published in 1879—49 years ago. It was an illustrated dictionary, which for the first time defined the proper terms or names of parts used in the construction of railway cars. Through the succeeding years, with the many changes and innovations in car design, the successive editions of the Car Builders' Dictionary, as it was first called, have faithfully recorded the new information and new developments.

The work is edited by Roy V. Wright, managing editor of the *Railway Age* and editor of the *Railway Mechanical Engineer*, assisted by R. C. Augur and compiled under the direction of the advisory committee of the American Railway Association, Division V, Mechanical.

The Behavior of Prices

By Frederick C. Mills, National Bureau of Economic Research, New York. 598 pages. Price, \$7.

Business men and economists will find this book of the greatest interest. It is notable for the emphasis which is placed on the individual commodity. It shows the relation of the price movements of individual commodities to the movements of other individual price series. It also treats price series in combination. By turning to the commodity index the reader can locate all the references in the book to the specific commodity that interests him, and by following the page references can trace the variability of its price; its trend over a period of years; the length of its own business cycle; and how it acts during general price movements.

The objectives of the present study were, first, to secure a fuller understanding of the behavior of individual commodity prices and, secondly, to increase the knowledge of the working of the price system and of the interrelations between its component elements. No attempt has been made in presenting the results of this study to support a specific thesis. The investigation has been looked upon as part of a general attack upon the problem of charting the price system, defining its elements,

tracing the connections between these elements, determining the nature of the changes which occur in the price system with the passage of time and with changes in general economic conditions, and of describing more exactly the part which the system of prices plays in economic processes. This view of the relation of the present study to the broad task of surveying the price system has conditioned the plans for the investigation and has determined the form in which the results appear.

The Road to Plenty

William Trufant Foster and Waddill Catchings. The Pollak Foundation for Economic Research. Boston, Houghton, Mifflin Company. 232 pages. Price, \$2.

In the "Road to Plenty," the authors offer their solution for the "dilemma of thrift" which they pointed out and thoroughly discussed in their three previous books, "Money," "Profits" and "Business Without a Buyer." The new book is written for the layman. The theory which Messrs. Foster and Catchings have propounded in their earlier works is that economic depressions, with their accompanying unemployment, idle factories and capital are due to the reduction in consumer purchasing power, and that this reduced purchasing power is due, in turn, to the abstraction of both corporation and individual savings from the cycle of money flow between producer and consumer. This, then, is the dilemma, that the worker—who is also consumer—is urged to save, but by his savings brings about depression. He saves to his own ultimate disadvantage.

The cure for this condition, the authors believe, lies in increasing the construction of public works and production facilities at a rate sufficient to make up for the loss due to the abstraction of savings. Thus, by putting money into the hands of workers, the purchasing power always is kept even with productive capacity.

Obviously, if productive capacity, instead of being increased by spurts, were developed only at the same rate as the increase in consuming power, the economic swings would be avoided. Their proposal is that a mechanism be set up for holding productive and consumptive capacity in balance—to keep the consumptive power always large enough to absorb the goods the factories are able to produce. Their proposal, specifically is that the federal government collect data that will disclose at any time the relationship between productive and consumptive capacities and, when the latter tends to decline, to increase public works construction. Now we know where we are only when the depression is upon us. To serve a preventive purpose the data will need to be much expanded, and this is what Messrs. Foster and Catchings recommend.

Looking at their proposed remedy, it is patent that the problem is a complex one and that the solution will not be easy. There is the difficulty, first, of getting all the data; second, of knowing what the data mean; third, of setting up the mechanism for wise and speedy increase of public works construction. But, as the authors maintain, we shall not progress towards a solution unless we try.

National Electric Safety Code

Handbook Series No. 3 of the Bureau of Standards, fourth edition. Department of Commerce, United States Government Printing Office, Washington, D. C. 526 pages. Price, \$1.

In the preparation and revision of the code the Bureau of Standards had the co-operation and assistance of many state industrial and public service commissions, municipal electrical inspectors, engineers of operating and manufacturing companies, committees of engineering societies and representatives of the electrical workers of the fire and casualty insurance interests. The revision was carried out under the rules of procedure of the American Engineering Standards Committee. The fourth edition contains but minor changes in the general substance of the rules. The regulations dealing with line construction incorporate some important changes. The rules of this part have been rearranged entirely. This new arrangement should increase the facility of reference and make more clear the intended effect of the requirements.

A new section, part 5, has been added dealing with radio installations. The code represents a growth and development which will necessarily continue. The code rules provide specifically for variations from particular requirements when circumstances warrant different practices. Sag and tension tables and curves are included in the appendices.

Utilities Commissioners Association

1927 Proceedings of the 39th Annual Convention, National Association of Railroad and Utilities Commissioners—New York, N. Y. 600 pages. Price, \$5.

Full reports on valuation, public relations, public ownership, safety of operation, motor vehicles and others on up-to-date topics before the Dallas Convention of this association are printed in full in the 1927 Proceedings of the National Association of Railroad and Utilities Commissioners. The addresses of many speakers such as William A. Prendergast, chairman New York Public Service Commission and Lucius S. Storrs, managing director of the American Electric Railway Association, are of interest to bankers, lawyers, railroad executives and public utility managers. Special features are the addresses of John J. Esch, former chairman of the Interstate Commerce Commission, entitled, "The Age of Speed" and of Frederick A. Farrar, vice-president of the Electric Bond & Share Company, called, "Financial Problems of Public Utilities."

Personal Items

J. S. Harrison Has New Title in Jacksonville

J. S. Harrison, for more than a quarter of a century claim agent of the Jacksonville Traction Company, Jacksonville, Fla., is now known as general claims attorney. The general claims attorney began working for the Jacksonville Traction Company as secretary to the manager in 1899 and was made claim agent in 1902.

Mr. Harrison was born at Olustee, Fla. He attended the Florida University, which was then known as the Florida Agricultural College. He took a special course in law at the Florida Law School under Walter B. Clarkson, of Yale.

Changes in North Dakota Commission

At the reorganization meeting of the Board of Railroad Commissioners, North Dakota, held on April 1, Fay Harding was elected president. Among his present duties Mr. Harding will continue to handle the matters relating to the licensing of buses.

Ben C. Larkin has been appointed commissioner succeeding the late Frank Milhollan. Mr. Larkin has been chief elevator accountant for the commission since July, 1925. For many years he was active in public life in North Dakota and is a former Speaker of the North Dakota House of Representatives.

New Receiver of Detroit-Jackson Road Selects Staff

Following the appointment of John F. Collins, vice-president and general manager of the Michigan Electric Railway lines, as receiver for the Detroit, Jackson & Chicago Railway, he announced the following staff:

H. D. Sanderson, Jackson, chief engineer and manager for the receiver; Otto H. Degener, Jackson, secretary-treasurer; G. W. Quackenbush, Grand Rapids, traffic manager; R. C. Taylor, Albion, superintendent of equipment; R. Southard, Ypsilanti, general superintendent; R. W. O. Taylor, Jackson, purchasing agent.

Besides directing the management of the M. E. R. lines, Mr. Collins is president of the Southern Michigan Transportation Company and the Rapid Transportation Company, operating buses between Jackson and other Michigan cities. Electric railway and bus lines totaling 723 miles in length are administered by Mr. Collins from his central office in Jackson.

In commenting on the appointment of Mr. Collins, the *Citizen-Patriot* of Jackson said:

The appointment is an earned tribute to Mr. Collins' ability as an administrator.

In the face of the most discouraging competition he has kept the M. E. R. system out of receivership, and through the organization and promotion of bus routes paralleling the electric lines has infused new hope into the interurban transportation business in Michigan. The bondholders of the D. J. & C. apparently have turned to him as a refuge in time of distress.

H. T. Connolly Heads Maryland Association

H. T. Connolly was elected president of the Maryland Utilities Association at the meeting in Baltimore on March 23. Mr. Connolly is general manager of the Washington, Baltimore & Annapolis Electric Railroad. He entered the service of that company twenty years ago, starting in as a substation operator. Later he was promoted to



H. T. Connolly

the position of foreman of substations. Three years thereafter, at the time the Washington, Baltimore & Annapolis acquired the old Annapolis Gas & Electric Light Company, later the Annapolis and Chesapeake Bay Power Company, Mr. Connolly was made superintendent of power and in 1922 he became manager of utilities. Two years later he was made superintendent of equipment and in June, 1925, was appointed general manager of the property. At that time James J. Doyle was elected president. Before Mr. Connolly's affiliation with the Baltimore organization he was in the electrical field, serving with the old Maryland Steel Company, now the Bethlehem Steel Company, at Sparrows Point, Md.

Mr. Connolly was born in Baltimore Dec. 29, 1888. He attended private schools in that city.

WILLIAM N. NEFF has been appointed general superintendent, in charge of operation and maintenance of way and structures of the entire Northwestern Pacific Railroad System. Since April 1 his headquarters have been at Sausalito, Cal.

H. V. Faber at Savannah, and B. T. Moore in Jacksonville

H. V. Faber, for two years assistant treasurer of the Jacksonville Traction Company, Jacksonville, Fla., has been transferred to the Savannah Electric & Power Company, Savannah, Ga., to act in the same capacity. At Savannah he succeeds Paul Fleming, who resigned to become associated with the Philadelphia & Reading Coal & Iron Company at Philadelphia.

Mr. Faber went to Jacksonville in July, 1926, from the treasurer's office of Stone & Webster, Inc., of Boston, to become assistant treasurer. He was at one time assistant treasurer of the Haverhill Gas & Light Company, Haverhill, Mass., and prior to that was traveling auditor for the parent organization. During the time the Hog Island shipyard was under the executive management of Stone & Webster he was cost accountant there. He was also treasurer of the Florida Public Utilities Information Bureau.

Benjamin T. Moore, formerly a traveling auditor for Stone & Webster, Inc., from the firm's office in Boston, has succeeded Mr. Faber at Jacksonville. Mr. Moore was at one time chief clerk of the Mississippi River Power Company. Later he was assistant treasurer of the Keokuk Electric Company, Keokuk, Iowa. In 1925 he was assigned to the auditing department at Boston.

P. A. MAXIMOV, president of the Soviet Electrotechnical Trust, has arrived in New York accompanied by B. I. Bukhovtsev, production manager of the trust, to make a study of the electrotechnical industry and of electric railways in the United States. The introduction of electrical power in industry, transportation and for lighting purposes is proceeding now on a scale never before known in Russia. Mr. Maximov expects to stay in this country about six weeks. Together with Mr. Bukhovtsev he will visit Schenectady, Boston, Chicago, Milwaukee and other industrial centers.

Obituary

HOMER M. PRESTON, railway operator and banker, died at his home near Jamestown, N. Y., on April 2. Mr. Preston was president of the Jamestown, Westfield & Northwestern Railway, the Jamestown Street Railway and the Jamestown Motor Bus Transportation Company. When Almet N. Broadhead, who controlled the Jamestown properties, died in 1925 Mr. Preston was elected president. While separate corporate structures have continued, the railway and bus lines have been operated under one general management. Mr. Preston had previously served as a director and vice-president of the Warren-Jamestown Street Railway and had been affiliated with the Southwestern Interurban and with the Union Traction Company.

Manufactures and the Markets

Chicago "L" May Buy 200 More Cars

Many improvements in service have been made by the Chicago Rapid Transit Company, Chicago, Ill., during the last five years. The company has added 205 new steel cars of the latest design to its equipment. It has lengthened station platforms on the Loop and on all the lines, and operated six-car and eight-car trains in the rush hours, where previously five-car and six-car trains were operated. It has built a large modern station at Quincy and Wells Streets, with convenient connection to the Loop station platform at Quincy and Wells Streets, and it has built the first unit of its new shops at Niles Center. Those are a few of the major improvements that have been made in the last few years for the better service of the public.

There are other improvements which the company would like to make. There is a pressing need for express tracks on the Garfield Park Branch between Marshfield and Laramie Avenue. The company would like to purchase 200 additional steel cars this year. The carrying out of these improvements would appear to be presaged on the success of the company's appeal for a change in rates, now pending, since as the company itself says that "the money to make such improvements must come from investors, and unless the company can show reasonable earnings on its investment, new capital cannot be obtained."

Danville and Crawfordville Railway Proposed

Construction of an electric railway between Danville, Ill., and Crawfordville, Ind., and a secondary line between Ridgefarm and Paris, Ill., giving the Illinois Traction System and the Terre Haute, Indianapolis & Eastern lines two connecting links, was discussed at a conference in Danville recently. D. W. Snyder, Jr., vice-president and general manager of the Illinois Traction, and G. K. Jeffries, Indianapolis, vice-president and general manager of the Terre Haute, Indianapolis & Eastern, met representatives of the cities interested in the plan to link the two railway systems. The Paris line discussion brought out that a belt line would be imperative around Terre Haute, where heavy freight trains are not allowed through the city, adding \$1,000,000 to the project cost and the Ridgefarm-Paris line would mean another \$800,000. Use of this route as the main line would require strengthening of the trackage between Danville and Ridgefarm and between Paris and Terre Haute, with 40 miles added to the route distance. Illinois Traction representatives favored the direct line, but added that a light freight line serving the Paris district might be

advisable since it would cost less. The Crawfordville line would involve an expense of between \$4,000,000 and \$5,000,000 since the Vermilion River would have to be crossed once and the Wabash twice.

Kansas City to Complete Rehabilitation

The Kansas City Public Service Company, Kansas City, Mo., will spend over \$2,000,000 this year to complete the \$6,600,000 rehabilitation program planned when the company was reorganized. The program of the construction department involves the laying of approximately 20 miles of tangent track and 27 new special work layouts. The work of this department will cost more than \$1,000,000. It was scheduled to start March 1 and end in October.

The maintenance department will remodel 414 passenger cars during the year. Safety air equipment will be installed on 93 100-type cars, 47 400-type cars, and 14 1,000-type cars, or 154 cars in all.

The 1928 program includes the installation of ventilators, window wipers, safety air equipment, line breakers, back-

up control on double-truck cars, air rectifiers, thermostatic heat control, economy meters, double folding doors and treadle-operated doors on rear platforms. Aside from the regular overhaul work, rearrangement of the seats, stanchions and railings will be made where greater aisle space is needed.

In addition to the foregoing expenditure, the equipment department was allowed more than \$70,000 to cover other improvements, one important item of which is \$60,000 for the installation of steel wheels. This will equip approximately 50 per cent of the cars with steel wheels. All of this money is above the normal maintenance expenditure of \$663,000 for the year, making a total expenditure in the equipment department of approximately \$1,620,000.

In the other departments, way and structures, electrical distribution, and coach garage, \$220,000 was authorized for improvements, including an expenditure of \$157,000 to cover the cost of building a new a.c. distribution bus at the Grand Avenue power station and re-arranging the a.c. cables between the power station and the substations.

Trackless Trolleys for Prague

Trackless trolleys will be installed in Prague, Czechoslovakia, on a route where former street car service has been discontinued, it is announced by the president of the board of directors

Toronto Buses Delivered

Fifteen Mack city type buses have been delivered to the Toronto Transportation Commission, Toronto, Canada. This is the first consignment of buses for use in Canada to be equipped with rear treadle operated doors, a product of the National Pneumatic Company.

As an extra precaution for the safety of passengers using the rear-exit treadle doors, each bus has been equipped with a rear-view mirror. The mirror is fastened to the outer window frame on the right side of the bus, giving the driver a full view of the rear exit door. The buses are equipped with 29-passenger bodies of wood frame construction, built by the Bender Body Corporation.



The seating arrangement of the Toronto buses allows ample standing room for the rush hours



One of the fifteen Mack treadle buses delivered to the Toronto Transportation Commission

of the Prague Electric Railway Administration. The new cars will be arranged so that they can turn aside 5 m. or almost 16½ ft. on either side of the trolley wires. If they prove successful it is expected that their use will be extended.

Space Applications for A.E.R.A. Convention Mailed to Members

This year the Cleveland Convention Committee of the American Electric Railway Association, of which Col. J. H. Alexander is chairman, has provided over 135,000 sq.ft. of desirable inside space and over 3,000 lin.ft. of track space for car displays. Diagrams of the show space layout at the 47th Annual Convention, together with applications in duplicate, were mailed from Association headquarters, via registered mail to all manufacturer company members on April 14.

The procedure followed in previous years of allowing a time of 30 days for filing space applications, will again be in force this year. Fred Dell, exhibit director, calls attention to the fact that all applications received at Association headquarters, 292 Madison Avenue, New York, up to the close of business on May 14, will be awarded space by the exhibit committee, which meets shortly thereafter to make the official assignments. Should any space remain vacant after the official assignment, it will be allotted in the order in which applications are received.

Attention is also called to the fact that in order to assist the committee in making an intelligent space assignment, all questions on the application blank should be answered in detail. This is important and if the forms are filled in carefully exhibitors will save themselves some unnecessary annoyance in the way of additional correspondence to secure such information as asked for.

The exhibit this year promises to be larger than ever before. There will be some new companies which have not exhibited before, from both the railway and automotive field, and the products of these companies will bring added interest to the exhibit, which, it is agreed, is one of the largest and finest transportation exhibitions shown in the world today.

To secure a good location all who intend exhibiting are urged to get their applications in as promptly as possible. Each application is dated, time stamped and numbered in the order received and a careful check up of the list is presented to the exhibit committee when it meets to make the official allotment.

This is the one opportunity afforded manufacturers during the year to present to the practical railway man a comprehensive and intelligent display of old and new devices that are being offered and to bend his mind toward acquiring those products which will improve his service and consequently increase his income. Every manufacturer should at all times bear in mind that the annual convention and exhibit is

Cars Delivered to Boston Elevated Railway

The ten semi-steel cars being built for the Boston Elevated Railway, Boston, Mass., by the Laconia Car Company, Laconia, N. H., have been delivered. They are of the one-man, two-man double-end type, they have a total weight of 31,462 lb. with an over-all length of 45 ft. and a seating capacity of 48. Each car is equipped with four GE-264A inside-hung motors, GEK-71 control and Westinghouse air brakes with variable load attachment. Complete specifications were published in the Oct. 8 issue of the JOURNAL.



These one-man, two-man cars will seat 48 passengers



One of the ten semi-steel cars recently delivered to the Boston Elevated Railway

the market place of the industry and that from the Association's standpoint its every activity is directed to the one end of prospering the industry so it can make necessary appropriations for the purchase of new equipment, new materials and supplies. Don't delay sending in your space application.

T. W. Casey Heads National Pneumatic Company

At a meeting of the executive committee of the National Pneumatic Company, held April 10, Harold Rowntree resigned as president of the company and was elected chairman of the board of directors. At the same meeting Thomas W. Casey, for many years vice-president of the company, was elected president to succeed Mr. Rowntree; P. R. Forman, who has been general manager, was elected vice-president and general manager, and Frank Johnson was re-elected secretary and treasurer.

Roller Bearings Being Tried in Green Bay

A Birney type street car equipped with roller bearings has been put into service by the Wisconsin Public Service Corporation in Green Bay, Wis. The new roller journal bearings are of the Melcher type now being supplied by the Railway Motors Corporation, DePere, Wis., for steam railroad cars. It is planned to keep a close record of the power used by this car and the cost of

maintenance for the journal bearings. If the power is reduced 40 per cent as claimed, the economy may warrant the replacement of all present bearings.

Toronto Tests Lacquer

Toronto Transportation Commission, Toronto, Canada, has sprayed four cars with lacquer of four different manufacturers for the purpose of testing its durability as compared with enamel which is the standard material now used.

Foreign Traders to Talk on Latin-America

Five special trains will carry the bulk of the 1,500 delegates from all parts of the United States to the Fifteenth National Foreign Trade Convention to be held at Houston, Texas, on April 25, 26 and 27, next, announces O. K. Davis, secretary of the National Foreign Trade Council, in a statement of program and travel arrangements for the annual foreign traders gathering.

The principal theme of the convention will be trade with Latin America and the presence of business delegations is already assured from more than ten Latin American countries. In 1927 the total trade of the United States with Latin America was close to \$2,000,000,000, slightly greater than that of England, France and Germany, the three principal competitors of the United States.

American Engineers to Join in World Conference

Engineering leaders from practically every part of the United States meeting at Washington, D. C., on March 22 formulated preliminary plans for the participation of engineers of the United States in the World Engineering Congress which will be held next year in Tokio. An American Committee to arrange for the part the engineers of the United States will play in the Congress was formally organized and officers elected.

The engineers went to the capital on a special train from New York and Philadelphia for the dinner and meeting. The following officers and committee chairman of the American Committee, which will arrange for the sending of a large delegation of American engineers to the Congress in Japan, were elected: Honorary chairman: Herbert Hoover; chairman, Elmer A. Sperry, New York; vice-chairman and chairman of the executive committee: John W. Lieb, New York; vice-chairman, Pacific Coast: C. E. Grunsky, San Francisco; C. E. Kettering (Middle West), Detroit; executive secretary, Maurice Holland. Executive committee members are: Gano Dunn, New York; George W. Fuller, New York; Maurice Holland, New York; Dugald C. Jackson, Cambridge, Mass.; Frank B. Jewett, New York; John W. Lieb, New York; J. H. McGraw, New York; O. C. Merrill, Washington, D. C.; Calvin W. Rice, New York; Charles F. Scott, New Haven, Conn.; Elmer A. Sperry, Brooklyn, N. Y.; W. E. Wickenden, New York. John W. Lieb leads the finance committee; D. C. Jackson the technical program committee; F. B. Jewett the transportation committee; O. C. Merrill the entertainment committee; J. H. McGraw, publicity; promotion and attendance, George W. Fuller; nominating committee, Gano Dunn.

German Firm to Construct Electric Locomotives

Krupp, the great German engineering firm, has decided to undertake the construction of electric locomotives. In conjunction with the firm of Garbe, Lahmeyer & Company, of Aachen, a new type of motor for electric traction has been developed. This is a commutatorless, compensated single-phase motor, said to combine the efficiency of the three-phase motor with the advantages of the single-phase system regarding the supply of current.

As the result of satisfactory tests with the new invention, two shunting locomotives were constructed for the I. G. Farbenindustrie, one of which is said to have given entire satisfaction at a coal mine in central Germany. The importance of this new development lies in the fact that the current can be drawn direct from the main transmission lines, thus doing away with the necessity of transformer stations which hitherto have been essen-

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

Metals—New York		April 10, 1928
Copper, electrolytic, cents per lb.	.....	13.925
Copper wire, cents per lb.	.....	16.00
Lead, cents per lb.	.....	6.10
Zinc, cents per lb.	.....	6.10
Tin, Straits, cents per lb.	.....	51.75
Bituminous Coal, f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.	.....	4.15
Somerset mine run, f.o.b. mines, net tons.	.....	1.875
Pittsburgh mine run, Pittsburgh, net tons.	.....	2.00
Franklin, Ill., screenings, Chicago, net tons.	.....	1.825
Central, Ill., screenings, Chicago, net tons.	.....	1.675
Kansas screenings, Kansas City, net tons.	.....	2.375
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	.....	15.30
Weatherproof wire base, N. Y., cents per lb.	.....	16.5125
Cement, Chicago net prices, without bags.	.....	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	.....	10.00
White lead in oil (100-lb. keg), N. Y., cents per lb.	.....	13.25
Turpentine (bbl. lots), N. Y., per gal.	.....	\$0.635

tial. According to Krupp's estimate this will mean a saving of approximately 30 per cent on the present cost of electrification. The patent is owned by Krupp's, which will manufacture the locomotives, and the motors will be supplied by Garbe, Lahmeyer & Company.

Hungarian Electric Locomotives for Spain

The Ganz-Danubius Company and the Ganz Electrical Works of Budapest have just signed a contract with the Ferrocarriles Vascongados of Spain for the delivery of nine electric locomotives and eleven electric rail motor cars, of which six are to be passenger and five freight cars.

TRACK AND LINE

OREGON ELECTRIC RAILWAY, Portland, Ore., has filed an application to the Interstate Commerce Commission for authority to be substituted for the Linn County Logging & Lumber Railway in the proceeding on the latter's application for a certificate for the construction of an extension of its line in Linn County, Ore. The application states that the Linn County company has assigned its rights to the Oregon Electric, a subsidiary of the Spokane, Portland & Seattle Railway.

ST. LOUIS PUBLIC SERVICE COMPANY will improve the Wellston loop facilities so that seventeen cars may be handled at one time. The improvements will cost approximately \$95,000. One of the decided improvements will be that the St. Charles cars, which come into Wellston at Easton Avenue and stop for passengers in the very heart of traffic on the St. Louis-Kansas City highway, will now proceed to the loop to await their schedule time for departure, thus clearing Easton Avenue. The city limits and Wellston division of St. Louis will continue to use the loop.

LONG ISLAND RAILROAD, New York, N. Y., has been ordered by the Transit Commission to eliminate 31 grade crossings in Queens, N. Y., in accordance with the plan arranged with the state.

TRADE NOTES

ROBERT J. DENEEN and Frederic Attwood were elected vice-presidents of the Ohio Brass Company at a meeting of the board of directors held Feb. 7, 1928. Mr. Deneen is in charge of the company's sales activities in the Chicago district, while Mr. Attwood is in New York in charge of the eastern sales district.

WATSON-STILLMAN COMPANY, New York, has appointed as manager of railroad sales, H. J. Hair, formerly sales engineer for the Whiting Corporation. He will be located at the main office of the Watson-Stillman Company, 75 West Street, New York City.

GOLD CAR HEATING & LIGHTING COMPANY, Brooklyn, N. Y., has appointed as sales engineer with headquarters at Brooklyn, H. W. Dillon, formerly sales engineer of Chicago Pneumatic Tool Company. J. P. Rapp, formerly with Standard Steel Car Company, has also joined the eastern sales department with headquarters in Brooklyn, N. Y.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY has appointed Justin G. Smeby welding engineer at the South Philadelphia works. He is a member of the American Society of Naval Architects and Engineers and an officer in the U. S. Naval Reserve Force.

CANADIAN OHMER, LTD., Montreal, Canada, has been granted a Dominion charter for the purpose of acquiring the business of Canadian Taximeters, Ltd., and of marketing in Canada all products manufactured by Ohmer Fare Register Company of Dayton, Ohio. W. P. Kearney, Montreal, has been chosen president; H. B. Ohmer, Dayton, Ohio, vice-president and treasurer; M. W. Drayton, Montreal, second vice-president and secretary; R. H. Ohmer, assistant treasurer. These officers, together with R. L. Hubler, constitute the board of directors. A. J. Hopkins has been appointed general manager.

ADVERTISING LITERATURE

VANADIUM CORPORATION OF AMERICA, New York, N. Y., has issued a booklet "Automotive Springs," giving a description of the manufacture and requirements of springs.

INTERNATIONAL STEEL TIE COMPANY, Cleveland, Ohio, has published a bulletin descriptive of track paving on a production basis.

OHMER FARE REGISTER COMPANY, Dayton, Ohio, has printed form number 850 giving information on the use of Ohmer fare registers.

CONSOLIDATED CAR HEATING COMPANY, INC., Albany, N. Y., has issued a folder entitled "At the Port of Albany," descriptive of the various products that it manufactures.

Safe—



Car on a grade—power goes off—air gone—are passengers and crew safe?

If equipped with “Peacock” Staffless Brakes the stop will be sure—positive—*graduated*—as will also be the *release*. There is no doubt about “Peacock” action—no failure—the control of the car is perfect at all times. Your passengers and crew are *safe* in any emergency.

Specify “Peacock” Staffless Brakes on your new or rebuilt cars.

The
“Peacock”
Staffless



National Brake Co., Inc.

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Canadian Representative

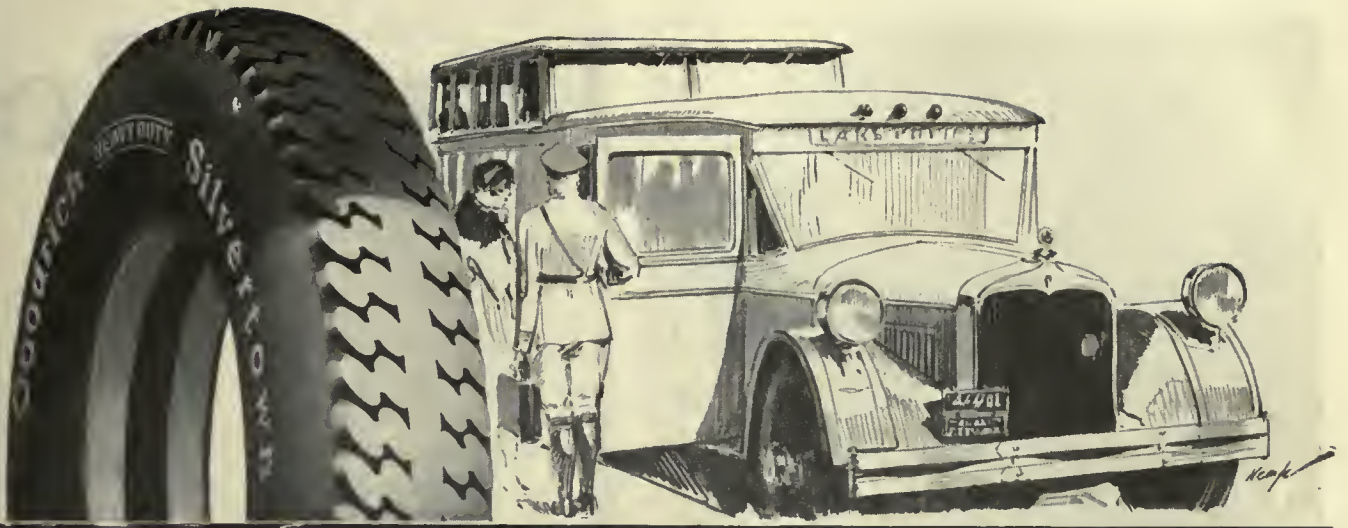
Lyman Tube & Supply Company, Limited, Montreal, Canada

The **LONG** *and*
SHORT
of modern
head Lighting



A long range beam for the open road—tilted for city driving and passing. That is the *long and short* of modern headlighting. If your motor vehicles are Tilt Ray equipped, you can be sure that you have the most efficient lighting system obtainable—and, by far, the most economical. The Guide Motor Lamp Manufacturing Company, Cleveland, Ohio.

Guide
TILT RAY
HEAD LAMPS



The Driver's Loyalty *isn't all in the pay check*

How do your drivers deal with the public? How do they act? How do they drive?

Good drivers and good-will go together.

And so do good drivers and good tires.

"A run of bad luck" with tires—forced stops—roadside tire changes—upset the best of men.

Goodrich keeps the "bad luck" out of Silvertowns. To give them remarkable

uniformity, they are water cured—a Goodrich process which cures from inside and outside both, reaching every part of the tire. They are built of cords matched for stretch—and pressure filled with rubber. They have extra gum between outer plies, for extra strength and extra resistance to heavy duty.

Performance records of some of the leading bus lines show what these processes mean to Goodrich Silvertowns. They keep mileage costs down—and drivers happy.

THE B. F. GOODRICH RUBBER COMPANY, Est. 1870
Akron, Ohio. Pacific - Goodrich Rubber Company, Los Angeles, Calif.
In Canada: Canadian Goodrich Company, Kitchener, Ont.

Goodrich

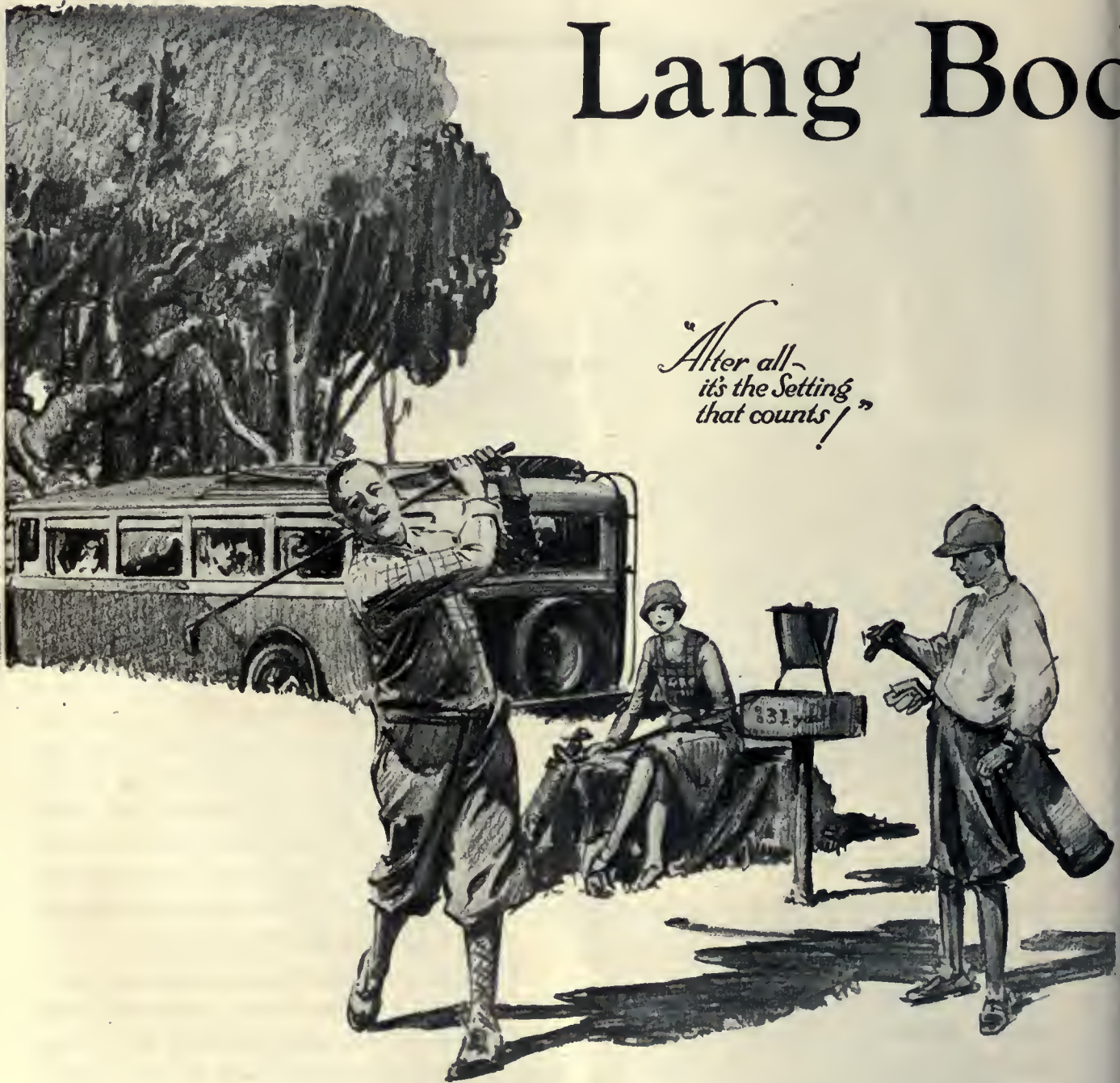
HEAVY DUTY

Silvertowns

HIGH PRESSURE OR BALLOON

Lang Bod

*"After all—
it's the Setting
that counts!"*



Only by the magic of complete relaxation may the golfer realize a perfect drive. Lang craftsmanship has built into a bus body the happy faculty for delivering its passengers soothed and rested — there's good will!

LB

The Sterling Mark on Bus Bodies

ies . . .

Increase Revenue

THE fascinating beauty, the luxurious restful comfort of Lang Bodies increases revenue.

Patrons who try, repeat—repeaters become regulars—all because Lang Bodies on your buses give them that most desirable thing in travel—comfort—safety.

And—Lang Bodies have the strength to make this comfort permanent.

The
**LANG BODY
COMPANY**
Cleveland,
Ohio



LANG BODY COMPANY has also developed All Metal Bodies which combine for the first time . . . strength with light weight . . . beauty with comfort.





FORGED
then **ROLLED**
 for
Safe,
Smooth
Service

BETHLEHEM Rolled Steel Wheels for electric railway service are safe, smooth-running and economical.

A combined forging and rolling process imparts toughness and gives the metal a grained, dense structure, insuring against breakage and crystallization. Flats are practically unknown.

Maximum service with minimum cost of maintenance is realized with every investment in Bethlehem Rolled Steel Wheels for Electric railway service.

Bethlehem forged steel axles possess the same high quality found in other Bethlehem forged products. They can be furnished heat treated, annealed, untreated or rough-turned all over.

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 Sole Exporter of our Commercial Products*

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102 YEARS OF MANUFACTURING EXPERIENCE



Rattan car seat webbing may be ordered through any H-W sales office

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FOR INTERURBAN NEEDS

THIS Heywood-Wakefield seat is designed for the modern type of interurban service where comfort is now so important. It has been selected for both new cars and for replacement use.

It has deep, double spring cushions shaped to allow more leg freedom. Mechanism rails are set in. The individual backs are properly pitched for comfort.

Our car seating experts will be glad to help you decide on the best seating equipment for your needs. This service is free through any H-W sales office.

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OHMERIZE*For***PROTECTION,
ECONOMY,
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566 OHMER FARE REGISTERS

added to the equipment of

INTERNATIONAL RAILWAY COMPANY, in Buffalo, New York

THE story of the International Railway Company of Buffalo is typical. It is one of America's leading transportation systems, composed of an extensive network of interurban and city lines. For years the interurban divisions of this company have been equipped with the largest type of Ohmer Fare Registers. Recently five hundred and sixty-six No. 22 Type Ohmer Fare Registers, which indicate and record three classes of fares, were installed in the cars of the Buffalo City divisions. So we are able to announce that the entire Buffalo City system, together with all the interurban lines feeding it, is 100% Ohmerized.

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For three decades we have specialized in the manufacture and in the proper

application of recording instruments for transportation service.

By specializing in this one field of activity, we have developed what is recognized throughout the world to be a unique service. Ohmer Factory Branches or Ohmer Sales and Service Stations are to be found in all principal cities supplemented by a corps of fare collection experts who are ready to help you.

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Industrial Counters for many purposes.

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It exactly fits
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fits needs of large

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Satisfied owners, after years of experience with Graham Brothers Motor Coaches, have admitted that they would have purchased them more readily if the prices had been higher. It took experience to convince them that they could get a 21-passenger street car coach of such high quality, complete for so little money. Only great volume production makes so low a price possible.

COMPLETE, \$4060, f.o.b. DETROIT



**GRAHAM
MOTOR**

SOLD BY DODGE BROTHERS

off-peaks of traffic, and small systems

“Everything a motor coach should be or have,” is appraisal by operators of Graham Brothers 21-passenger street car coach

Its 6-cylinder motor gives it power and speed with unusual economy.

Its 4-speed transmission gives it the most flexible use of that power and speed—rapid acceleration and an ease and smoothness of operation long thought unattainable.

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Its 3-stage progressive type springs, its general design and the construction of its seats provide comfort that wins and holds patrons.

Owners and operators, in constantly increasing numbers, give it preference in buying. They buy—and buy again.

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DEALERS EVERYWHERE

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OPERATORS are finding it increasingly profitable to furnish city patrons speed, comfort and safety comparable with that which interurban passengers have been enjoying. Deluxe express service in cities, often paralleling other forms of transportation, finds patrons willing to pay a higher fare. The field of service for Graham Brothers Parlor Coaches constantly expands. Their fine appearance attracts patronage. Their speed, safety, dependability and comfort hold patronage. Their low operating costs insure profits.

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"APRIL SHOWERS bring May flowers" . . . and so, too, each year you'll find a "shower" of new fabric-experiments, intended as substitutes for the time-tested Mohair upholstery, Chase VELMO—the triumph in textile craftsmanship.

To vary your choice and select a material other than a *genuine Mohair Plush* of proven merit may prove too costly an experiment. Let it rain substitutes. Chase VELMO, recognized as the leader of the Mohair Plush field, will still give you protection against the troubles of an unsatisfactory upholstery.

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1 ton or 1000

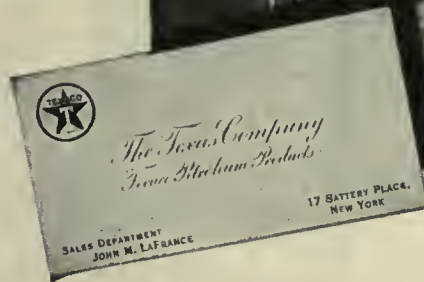
On quick notice, you can have shipped from Foster's nearest plant, 1 RAIL or 1,000 tons of RAIL with necessary ACCESSORIES—Angle Bars, Tie Plates, Frogs, Switches, Braces, Bolts, Nuts, Spikes, etc.—materials for any type and extent of track development . . . inside trackage, sidings, extensions, main line, and for track repairs. Your order will be on its way in 1 to 24 hours after Foster receives it. Every shipment subject to your inspection and approval at destination. Every piece of Foster Rail Equipment absolutely guaranteed.

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Every Texaco Product, wherever offered throughout the world, is made from The Texas Company's *own* selected crudes, produced from *its own* oil fields

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Adequate facilities for speedy delivery in any quantity, any time, anywhere.

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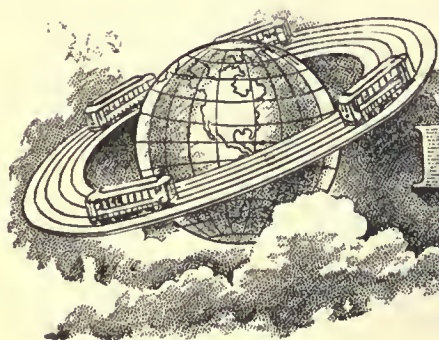
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JUST as the electric railway companies have to compile and be guided by exhaustive statistics as to peak loads, traffic densities, costs per mile, and so forth, we must constantly keep ourselves informed as to purchasing power, density of population and all vital market information in order to maintain our service as an active asset of your service.

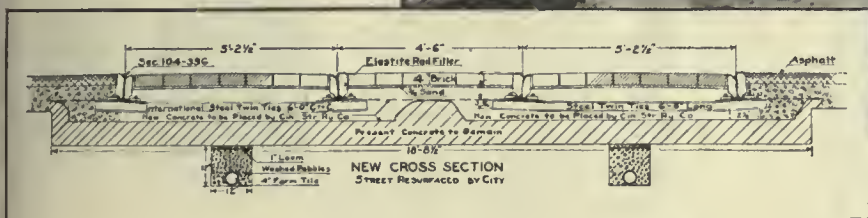


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Showing the method of track reconstruction on Reading Road, Cincinnati.

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a glowing example
of traction development

BY June 1, of this year, The Cincinnati Street Railway Company will have completed one of the most extensive improvement programs ever undertaken by a street railway system.

New car-shops—178,000 square feet of floor space! A new power distribution system . . . nineteen substations, ten of them brand-new and all full-automatic—under supervisory control.

Twelve miles of track reconstructed in 1926. Twenty-one miles in 1927.

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For every foot of this track is protected by a lastingly resilient cushion between the rails and paving. An average, every year, since the beginning of 1926, of *more than three hundred and fifty thousand lineal feet* of rail filler—Carey Elastite System of Track Insulation!

Carey Elastite
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Pave the Track Areas With Brick

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Vitrified brick pavements are durable. The maintenance cost is low. They satisfy all traction and vehicular requirements.

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Amcreco Poles

maintain a uniform factor of safety

Poles loaded heavily must have an ample factor of safety—not only when new but as long as they are to stay in service. A pole that is subject to decay begins to lose its strength the day it is placed. Never again is its factor of safety as high as when it was new.

Amcreco poles are protected against the weakening effects of decay by full pressure treatment with pure creosote oil. No deterioration sets in. Therefore, the strength is unimpaired and the factor of safety is uniform throughout the life of the pole.

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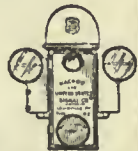


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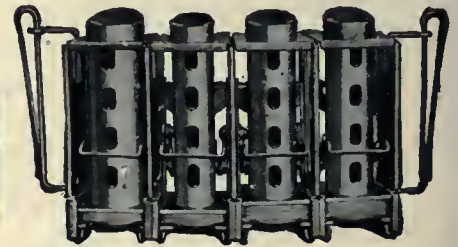
JOHNSON FARE COLLECTING SYSTEMS



Johnson Electric Fare Boxes and overhead registers make possible the instantaneous registering and counting of every fare. Revenues are increased 1 1/4 to 5% and the efficiency of one-man operation is materially increased. Over 4000 already in use.

When more than two coins are used as fare, the Type D Johnson Fare Box is the best manually operated registration system. Over 50,000 in use.

Johnson Change-Makers are designed to function with odd fare and metal tickets selling at fractional rates. It is possible to use each barrel separately or in groups to meet local conditions. Each barrel can be adjusted to eject from one to five coins or one to six tickets.



Johnson Fare Box Co.

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Here's one-man, safety cleaning!

CAR trucks, castings, and all repair parts, are easy to clean the Oakite way. In fact, one man operating a hoist to lift parts in and out of a tank containing a solution of Oakite Railroad Cleaner can accomplish as much work as a whole crew using the laborious, hand-scrubbing method.

This better Oakite cleaning is safe, too. It involves none of the dangers or disagreeable fumes of caustic and lye, or the fire hazards of kerosene.

Get all the facts about this one-man safety cleaning from the Oakite Service Man in your locality. Write for him to call. No obligation.

Oakite Service Men, cleaning specialists, are located in the leading industrial centers of the U. S. and Canada

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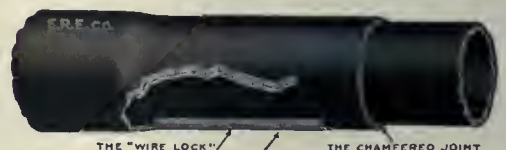
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Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

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Rates for larger spaces, or yearly rates, on request.
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SUPERINTENDENT transportation; well known in electric railway field, with broad experience, successful record city, interurban railways and buses, available short notice, correspondence invited. Fine references. PW-103, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

WANTED—Position as manager, general superintendent or M. M. of electric railways. Can qualify in every way. PW-99, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

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LEGAL NOTICE

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912

Of Electric Railway Journal, published weekly at New York, N. Y., for Apr. 1, 1928. State of New York ss. County of New York }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared C. H. Thompson, who, having been duly sworn according to law, deposes and says that he is the Secretary of McGraw-Hill Publishing Co., Inc., publishers of Electric Railway Journal, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

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Sworn to and subscribed before me this 30th day of March, 1928.

[Seal.] MARTIN J. WIEMER, Notary Public, Queens County, Certificate No. 1819. Certificate Filed in New York County, No. 272.

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ALPHABETICAL INDEX TO ADVERTISEMENTS

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.

Page	Page	Page	Page
Amerlean Brass Co., The, Front Cover	Electric Equipment Co. 43	Kelker, DeLeuw & Co. 40	Railway Utility Co. 45
American Car Co. Third Cover	Electric Ry. Equipment Co. 42	Kuhlman Car Co. Third Cover	Ramapo Ajax Corp. 41
American Crenosoting Co. 39	Electric Service Supplies Co. 9		Richey, Albert 40
American Steel Foundries 7			Roebling's Sons Co., John A. 47
American Steel & Wire Co. 47	Faile & Co., E. H. 40	Lang Body Co., The. 24 & 25	
Anaconda Copper Mining Co., Front Cover	Ford, Bacon & Davis. 40	Lorain Steel Co. 47	
	"For Sale" Ads. 43		
	Foster Co., L. B. 34		
		McClellan & Junkersfeld 40	Sanderson & Porter 40
Babcock & Wilcox Co. 41	General Electric Co. 18, 19, 20	McGraw-Hill Book Co. 38	Searchlight Section 43
Bates Expanded Steel Truss Co. 47	Graham Bros., Insert 29, 30, 31, 32		Smith Heater Co., Peter. 47
Beeler Organization 40		Nachod and U. S. Signal Co. 41	Standard Steel Works Co. 10
Bell Lumber Co. 41	Gold Car Heating & Lighting Co. 47	National Brake Co., Inc. 21	Star Brass Works. 47
Bemis Car Truck Co. 47	Goodrich Rubber Co., The B. F. 23	National Paving Brick Mfrs. Assn. 38	Stevens & Wood, Inc. 41
Bethlehem Steel Co. 20	Guide Motor Lamp Mfg. Co., The. 22	National Pneumatic Co. 13	Stone & Webster 40
Bridgeport Brass Co. 42		National Ry. Appliance Co. 45	Stock, A. H. 43
Brill Co., The J. G. Third Cover		Nichols Lantern Co. 41	Stucki Co., A. 47
Buchanan & Layng Corp. 40		Nuttall Co., R. D. 16	
Byllesby Co., H. M. 40	Hale-Kilburn Co. 45		Texas Co., The. 35
	"Help Wanted" Ads. 43		Timken Roller Bearing Co., The. 8
	Hemphill & Wells. 40	Oakite Products, Inc. 42	
	Heywood-Wakefield Co. 27	Ohio Brass Co. 5	Una Welding & Bonding Co. 47
	Holst Englehardt W. 40	Ohmer Fare Register Co. 28	Universal Lubricating Co. 45
Carey Co., The Philip 37	Hyman-Michaels Co. 43	Okonite-Callender Cable Company, Inc., The. 47	
Chase Co., L. C. 33		Okonite Co., The. 47	"Want" Ads. 43
Cincinnati Car Co. 14 & 15	International Steel Tie Co., Insert 11 & 12		Wason Mfg. Co. Third Cover
Cleveland Fare Box Co. 41	Irvington Varnish & Insulator Co. 45	Perey Mfg. Co., Inc. 45	Westinghouse Elec. & Mfg. Co., Second Cover
Collier, Inc., Barron G. 30		Positions Wanted and Vacant. 43	Westinghouse Traction Brake Co. 6
Columbia Machine Works. 42		Prettyman & Sons, J. F. 41	Wharton, Jr. & Co., Inc., Wm. 45
Consolidated Car Heating Co. 41			"What and Where to Buy" 44, 46, 48
Day & Zimmermann, Inc. 40	Jackson, Walter 40	Rail Joint Co. 45	White Eng. Corp., The J. G. 40
Dayton Mechanical Tie Co. 17	Johnson Fare Box Co. 42	Railway Track-Work Co. 4	Wish Service, The P. Edw. 40
Differential Steel Car Co., The. 45			

WHAT AND WHERE TO BUY—Continued from page 46

Tools, Track & Miscellaneous American Steel & Wire Co. Columbia Machine Works Elec. Service Supplies Co. Railway Trackwork Co. Ramapo-Ajax Corp.	Trimming Materials L. C. Chase & Co. Trolley Bases R. D. Nuttall Co. Ohio Brass Co. Trolley Bases, Retriving R. D. Nuttall Co. Ohio Brass Co. Trolley Buses Brill Co., The J. G. Westinghouse E. & M. Co. Trolley Material, Overhead Elec. Service Supplies Co. General Electric Co. Ohio Brass Co. Westinghouse E. & M. Co. Trolley Wheel Bushings Star Brass Works Trolley Wheels (See Wheels Trolley) Trolley Wire American Brass Co. American Steel & Wire Co. Anaconda Copper Min. Co. Bridgeport Brass Co. Roebling's Sons Co., J. A.	Tubing, Yellow and Black Flexible Varnish Irvington Varnish & Ins. Turbines, Steam General Electric Co. Westinghouse E. & M. Co. Turntables Elec. Service Supplies Co. Turnstiles Elec. Service Supplies Co. Perey Mfg. Co., Inc. Upholstery L. C. Chase & Co. Valves Ohio Brass Co. Westinghouse Tr. Br. Co. Varnished Papers and Silks Irvington Varnish & Ins. Co. Ventilators, Car Brill Co., The J. G. Cincinnati Car Co. Consolidated Car Heating Co. Nichols-Lintern Co. Nat'l. Ry. Appliance Co. Railway Utility Co. Vestibule Linings Haskelite Mfg. Corp. Welded Rail Joints Railway Trackwork Co. Una Welding & Bonding Co.	Welders, Portable Electric General Electric Co. Ohio Brass Co. Railway Trackwork Co. Una Welding & Bonding Co. Westinghouse E. & M. Co. Welders, Rail Joint General Electric Co. Ohio Brass Co. Railway Trackwork Co. Welding Processes and Apparatus Ohio Brass Co. Railway Trackwork Co. Una Welding & Bonding Co. Westinghouse E. & M. Co. Welding, Steel Railway Trackwork Co. Una Welding & Bonding Co. Welding Wire American Steel & Wire Co. Railway Trackwork Co. Roebling's Sons Co., J. A. Welding Wire and Rods Railway Trackwork Co. Wheel Guards (See Fenders and Wheel Guards) Wheel Presses (See Machine Tools) Wheels, Car, Steel & Steel Tire American Steel Foundries Bemis Car Truck Co. Standard Steel Works	Wheels, Trolley Columbia Machine Works Elec. Ry. Equipment Co. Elec. Service Supplies Co. National Bearing Metals Corp. R. D. Nuttall Co. Ohio Brass Co. Star Brass Works Whistles, Air Ohio Brass Co. Westinghouse E. & M. Co. Westinghouse Traction Brake Co. Window Guards & Fittings Cincinnati Car Co. Wire Rope American Steel & Wire Co. Roebling's Sons Co., J. A. Wires and Cables American Brass Co. American Steel & Wire Co. Anaconda Copper Min. Co. Bridgeport Brass Co. General Electric Co. Okonite Co. Okonite-Callender Cable Co. Inc. Roebling's Sons Co., J. A. Westinghouse E. & M. Co. Wood Preservations American Crenosoting Co.
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