

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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Applying Dispatching Principles in One's Work and Play

AMONG the ills from which the electric railways, like other industries, are suffering is the lack of effectiveness on the part of individual employees in all ranks and departments. Few make the most of their opportunities, the majority failing to realize that what benefits the service reacts to their own profit. If this statement is accepted, it follows that the biggest job on the manager's hands is an educational one. It consists in arousing the employee's self-interest and assisting him to apply it so as to produce results for himself and his employer. The following homely philosophy applies to the present situation.

In this democratic country the success of every individual is largely up to himself. This success is due in great measure to the way in which he employs his time, both that which he sells to his employer and that which he reserves for himself. The man who appreciates this fact and acts upon his knowledge has an enormous advantage over his fellows, because most of them are prodigal in their wastage of this unreplaceable resource. The thrifty one prospers not only because he is wise but also because so many are fools. The railway man ought to be more careful in this matter than many, because he sees constantly illustrated the importance of careful dispatching. He should find it easy to apply the same principle in the use of his own work and play time.

Arnold Bennett has put the thing in a nutshell in his little book, "How to Live on Twenty-four Hours a Day." The underlying idea therein is that the average man's time is not well utilized, that he needs a program in order to make the most of his twenty-four hours a day. The fact is that he needs a schedule. His duties require dispatching. It's up to him, not his employer, to do this dispatching. The chap who knows how to employ his time well is the "boss's" joy. He'll be boss himself some day.

Sitting recently in a railway office, waiting to see the "big chief," the writer had opportunity to study the clerks at close range for some time. He felt depressed at the apparent lack of plan and purpose in their work. "These fellows," he thought, "need a dispatcher." The opposite condition was illustrated in the case of Frank A. Vanderlip, the famous contemporary banker. When engaged as a vice-president of the National City Bank, he had no duties assigned to him. He was in fact apparently left upon his own resources. Somewhat nonplused at first, as soon as he realized that it was incumbent upon him to make his own work he lost little time in doing so. He was a good self-dispatcher. His promotion in due course to the presidency of the bank was a logical outcome. He just couldn't help it.

The way in which some people can turn out work is a marvel. Theodore Roosevelt was a conspicuous example. His career almost makes one dizzy to contemplate. He was able, among innumerable duties, to write

more than 150,000 letters, many of them lengthy. He could do all of this because he early acquired the practice of dispatching his work. And he knew how to play, too. What he did on a large scale, all railway men can do on some scale. But unfortunately, most of them won't. If many did the railway millennium would be here.

Efficient Lubrication Is a Vital Maintenance Problem

ELECTRIC railway men responsible for the maintenance of car equipment have long recognized that the period that a car can safely run between oilings determines the maximum inspection period for the entire equipment. Efforts of designers have therefore been devoted largely to arrangements that will insure proper lubrication over as long a period as possible. Oil wells have been provided in the motor housings to carry an additional supply of oil over that contained in the waste packing, and openings for inspection and refilling have been made as accessible as possible to insure proper attention.

Careful design is but one link in the chain of efficient lubrication. Others of equal importance are the use of proper materials for packing, lubrication and bearings as well as the application and maintenance of these materials when used.

Manufacturers now consider the furnishing of service and advice relating to their product just as essential to their success as the sale of their material. Oil companies have experts who visit the various railway properties and advise those responsible for the application of their product as to the most efficient use and the proper grades of oil that will give the most satisfactory service under the conditions of operation. Railways follow the advice given with confidence as experience has shown that these experts know their particular branches thoroughly and suggest many helpful policies. The choice of materials is thus taken care of in a satisfactory manner.

The problem of lubrication and bearing maintenance is a very vital and difficult one. The work of an oiler is not particularly attractive, and it is hard to keep men on this work for a sufficient length of time to train them thoroughly. Trained men are very necessary, however, if the best results are to be obtained. One way of making the work attractive is by increasing the rate of pay. It is not economical to use cheap men for this work, as much depends on the thoroughness with which the work is carried out. A careless inspection may result in damage to an armature necessitating its rewinding and thus cost more than a month's pay of a good man. Definite limits of wear for bearings should be adopted for each shop. They assist the workman, and the best of lubricants and the most efficient method of applying them will not lubricate a bearing worn so that improper alignment results.

An efficient oiler should also have a knowledge of the

different classes of babbitt and of waste packing. He should know how to babbitt bearings and pack boxes as well as have a knowledge of the grade of lubricants and methods of applying them. The quality of the lubricants used is very important, but the type of man who applies them and inspects the bearings is more important.

A Good Product Is Necessary Before Advertising Is Valuable

ADVERTISING, as a proper and necessary activity on the part of railways, has been constantly urged by the ELECTRIC RAILWAY JOURNAL and by other agencies devoted to the best interests of the electric railway industry. But it will not pay to advertise anything, unless the advertiser is prepared to "deliver the goods."

There has been a good deal of talk in railway circles about selling transportation, but sight must not be lost of the fact that the transportation should be "salable" if it is to be sold. Once in a while a good salesman can sell a poor product, even in the transportation business, but in the long run it is risky business to advertise poor wares.

The letter of J. A. Emery in the Nov. 5 issue of this paper is typical of remarks both within and without the industry. There is no lack of appreciation of the financial difficulties attendant upon providing more salable transportation, but what enterprising merchant who had suffered reverses would attempt to build up his business with a mediocre product expecting the public to appreciate his plight and buy more of his mediocre foods at higher prices to put him on his feet? The lack of complete parallel is fully appreciated, but there is enough in the comparison to think about.

Selling Raisins and Selling Rides

WHO has not seen the breaking out like a rash lately of little red cartons of raisins at 5 cents the package? A few months ago the only way to buy raisins was by the pound. While many people have always loved to eat them "in the raw," they were not willing to buy more than they could eat comfortably *en passant*. What was it that prompted the raisin growers to make so sensational a departure in their selling methods? The answer is: An overproduction of raisins that could not be disposed of through the traditional channels of merchandising. Something non-traditional had to be done, and done quickly and in a big way. What happened was that the raisin interests got together and agreed upon an advertising campaign running into hundreds of thousands of dollars, for as merchants they understood very well that good wine does need a bush, notwithstanding the old proverb. Within a few months, the slogan: "Have you had your daily iron?" was known from coast to coast. It was not long before it actually became difficult to supply the demand. It is reported that in one case several carloads of raisins on the way to a candy manufacturer were practically torn from his hands at a price far beyond his own outlay.

Is there no tip for electric railways in this wonderful coup? Why cannot we devise selling schemes that will give the street railway ride a new and more attractive flavor? Must we forever continue to sell our product at the same price regardless of quantity, of quality, of

time of day, or can we devise various means of giving the public what it wants in the right size package at the right price? The economic conditions, tastes and transportation standards of pre-war and pre-auto times have gone, never to return, and with them must go the idea that people ride street cars only because they have to and not because they want to save time and its equivalent in money.

As a corollary or proof of the truthfulness of this argument, the actual selling of rides in Youngstown, Ohio, as described elsewhere in this issue, is offered in evidence. The records from the first few weeks use of the new pass surely indicate that rides which would never have been taken otherwise have added materially to the company's revenue.

Reduce Unnecessary Handling of Equipment

THE two great things needed in our shops today are the ability to do work cheaply and to do work well. Both require proper shop equipment efficiently arranged. This means that in laying out a new shop or reconstructing an old one the equipment engineer should proportion the amount of space in the various departments to a large extent according to the equipment used and its arrangement.

While, no doubt, there is an urgent need for new machine tools in most of the present railway shops, few officials feel that such an expenditure can be undertaken at present. The rearrangement of present equipment, however, is an important problem that can be undertaken and should be considered in any plans looking toward increased production, better workmanship and reduced cost for performing the work. The expense is small for regrouping machines and relocating departments, but important results can be accomplished by doing away with unnecessary movements of operation and the handling of the parts to be repaired. The efficient arrangement of buildings and machinery always receives very careful consideration in manufacturing plants, and while few railway shops do very much manufacturing, the principle can be applied to equipment repairs with beneficial results. There are too many railway shops where the most frequent and important jobs require the transporting of equipment from one department to another and back again before the repairs are finished.

Electric welding equipment is now considered quite essential for railway maintenance work. Where this work is done as a separate department its location convenient to the truck and overhauling shops will save much unnecessary labor. The Washington Railway & Electric Company has provided permanent lines from the welding room with plug-in sockets located in the truck and carpenter shops so as to take care of repairs to parts which cannot be easily transported to the welding shop. A convenient arrangement and location for the wheel and axle work is most essential, and cranes located so that wheels can be handled from the trucks to the wheel lathe in one operation will increase the production of the overhauling department.

The mere provision of machine tools for doing the work is not enough. Careful consideration of the handling problem is equally important. A study of conditions as they exist in connection with routing diagrams will usually disclose many improvements that can be put into effect without excessive cost.

Baltimore's New Trail Cars

By Changing Gear Ratio, Strengthening Brake Rigging and Installing New Control Equipment and Couplers, Motor Cars Already in Service Were Provided for Hauling the New Trailers

BY L. H. PALMER

Assistant to President, United Railways & Electric Company, Baltimore, Maryland.



CENTER-ENTRANCE TRAILER IN OPERATION

THE United Railways & Electric Company of Baltimore has made it a practice to purchase a substantial number of new passenger cars almost every year. For about fifteen years these purchases have all been semi-convertible, four motor, prepayment cars with four passenger longitudinal seats at each end, and seven pairs of cross seats in the center of the car, which provided a standard seating capacity of forty-four. Later purchases of cars have had inclosed vestibules with three additional platform seats, making a total of forty-seven. The cars of the open-platform type are being converted into closed platform cars, so that at the present time out of a total of 560 open-platform, semi-convertible cars, all but fifty-four have been changed over to the inclosed platform prepayment design. During the war eighty cars of the same general type, seating fifty-five people, were purchased. Altogether the company owns 884 cars of this pattern. The maximum peak requirement for normal service had reached 1,175 before the present business depression.

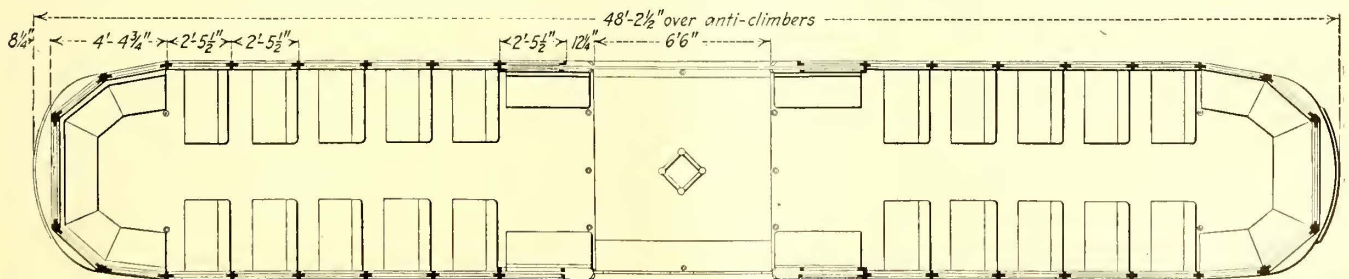
In 1919 and the early part of 1920 careful investigation was made to determine the type of new equipment that should be purchased to replace worn-out cars and also to provide additional passenger capacity, and as a result of these studies 100 center-entrance trail cars seating sixty passengers each were purchased.

These trail cars, complete, cost just about one-half as much as a motor car, and their capacity was 14.4 per

cent greater than our latest standard four-motor, fifty-five-seat cars, and 40.9 per cent greater than the standard forty-seven-seat cars, these percentages being based on the average fifteen-minute maximum load allowed under the rules of the Public Service Commission of Maryland.

A survey of the equipment in service indicated that three of the series of cars already in use on the property had sufficient motor capacity to haul these trailers for two or three hours during the morning and evening peak periods, without unduly burdening the motors. Eighty of these cars were used on the Bay Shore line and provided with high-speed equipment operated over a suburban route to a park some 16 miles from the center of the city.

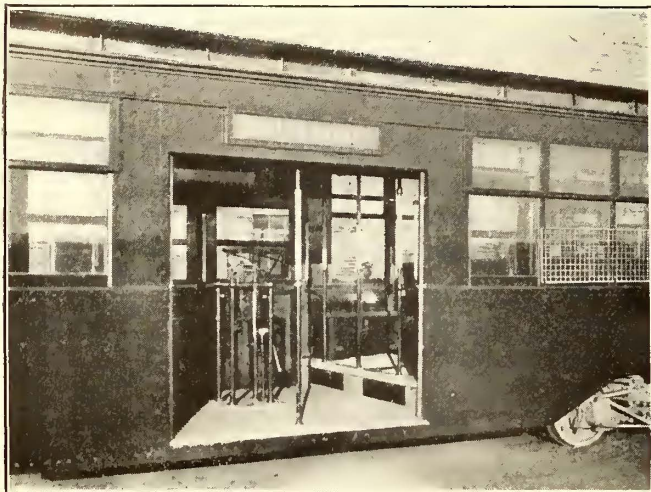
By changing the gear ratio, installing Tomlinson couplers, strengthening the brake rigging and installing new control, we were able to provide a motor car that could haul these trailers over any of the grades and road conditions met with in Baltimore. These cars had been in service since 1905, and were in good physical shape, although the control equipment, which was of the old AB type and had seen very severe service, had reached such a point that its maintenance cost was extremely high and it had either to be entirely rebuilt or replaced. Furthermore, the high gear ratio had given much trouble, particularly when running at low speed through the congested city streets. Here was an opportunity,



FLOOR PLAN OF CENTER-ENTRANCE TRAILERS

therefore, to rehabilitate these cars as far as the control equipment was concerned, putting on new gears, vestibules and new couplers, and thus get much more efficient service out of them, and reduce motor trouble and power consumption by installing a 14:70 pinion and gear combination instead of an 18:66. Into this program the trail car fitted remarkably well.

In addition to the high-speed suburban cars referred to, a number of four-motor cars from other lines were



A LOW STEP TO THE ENTRANCE WELL

equipped with necessary couplers, air-brake and control apparatus to operate trailers. These latter cars did not have as large motor capacity as the ones previously referred to, but had sufficient to handle the trailers over some of the more level lines of the city.

Altogether 130 cars were equipped to handle 100 trailers, the additional thirty cars being intended to provide for disabled cars, accidents, contingencies and to give sufficient flexibility.

WEIGHT PER SEATED PASSENGER VERY LOW

The cars purchased, as shown by the floor plan and the pictures of the exterior and interior, were of steel. The car complete weighs 29,000 lb. and with its seating capacity of sixty gives an average weight per seated passenger of approximately 484 lb., which was practically one-half the average weight per seated passenger of our latest four-motor equipment, and about one-third that of our heaviest four-motor equipment.

It is obvious that the rush hour carrying capacity of the cars pulling these trailers was more than doubled with the use of one more platform employee. The congestion on the streets was reduced somewhat, due to the operation in two-car trains instead of as single cars. This increase in capacity was estimated at from 15 per cent to 25 per cent, depending upon the degree of congestion and the amount of vehicular traffic. The use of these trains has meant quicker loading of passengers, together with faster operation over intersections.

It was also concluded that there would be some decrease in maintenance expenses of track, due to the lighter weight of the cars, and of course there was lessened consumption of current for the same reason. A saving of approximately \$50,000 annually was estimated in maintenance of equipment, through the use of trailers, a large part of this accruing because we would be enabled to retire approximately 100 old-type cars, equipped with inefficient motors which were practically worn out and whose maintenance was most expensive.

Mention has been made of the fact that these trail cars cost about one-half of what motor cars would cost. Due to the high cost of new money, the capital saving effected by postponing the purchase of further motor cars was material. It might be added that during our studies serious consideration was given to the use of the Peter Witt design of motor cars, and we are favorably inclined toward the use of this car when it becomes necessary to purchase additional motor equipment.

Some decrease in accidents was expected, due to the center-entrance feature, the entirely inclosed car body and the location of the conductor at the only entrance and exit, and in complete control thereof. From the public standpoint, a favorable impression was made by furnishing new, large, commodious cars and by the elimination of worn-out equipment of obsolete design, whose break-downs caused delays to the service and criticism.

The motor cars released by the operation of the trailers, except the obsolete cars referred to, enabled us to displace equipment of smaller capacity on other lines, thus providing improved service and additional seats, without the operation of additional car-miles.

It has been found feasible also, as was expected, to use these trail cars on lines serving resorts and amusement parks on Saturdays, Sundays and evenings during heavy riding in the summer season.

Some revision of terminal facilities became imperative, particularly if trailers were to be operated. Loops had to be provided at the ends of the lines, and special work at some carhouses had to be rearranged. It has been necessary to watch carefully the handling of these cars at terminals, because we realize the time necessary to couple them and put the cars into service would affect the headways. Proper track layouts and the education of crews have practically eliminated this difficulty.

There is some lack of flexibility, because these cars must always be handled as trailers and even in an emergency cannot be used as a front end of any train, as they are not provided with control equipment. However, this has not proved a serious disadvantage, nor have the sizes of the operated units been a serious detriment in moving through the crowded and narrow streets.

During the past summer the performance of the motors on the cars pulling trailers has been carefully watched, and our judgment is that, generally speaking, the motors have not been seriously overloaded, although it has been found that the all-day duty could not be obtained without a substantial increase in motor capacity.

Aside from the financial question involved in the purchase of trailers versus motor cars, the four controlling factors from the operating standpoint were: (1) Loops and carhouses, (2) grades and clearances, (3) substation and distribution capacity, (4) motor-car capacity. No changes in clearances or grades were necessary, except at a few places, particularly corners where the curbs had to be set back a little, because of the center well of the trail cars. Some rearrangement of distribution lines was necessary, a provision would have been required anyway, had service on the routes in question been increased by the addition of motor cars instead of trail cars.

The 100 cars were divided among six of the important trunk lines of the system, releasing thirty motor

cars for other service, besides eliminating 100 obsolete cars previously mentioned. An estimated saving of 11 cents per car-mile was calculated from the operation of trailers, and in actual practice the figures to date indicate that this saving has been made.

One of the operating difficulties encountered, and which we are overcoming through careful instruction and supervision, is occasioned by the use of semi-automatic air brakes. If a motorman is not careful to release most of his air while the car is standing awaiting the loading and unloading of passengers, he will lose two or three seconds per stop after getting the proceed signal. This delay can practically be eliminated if the motorman is alert and handles his air brakes according to instructions.

ADDITIONAL LOOPS WERE NECESSARY

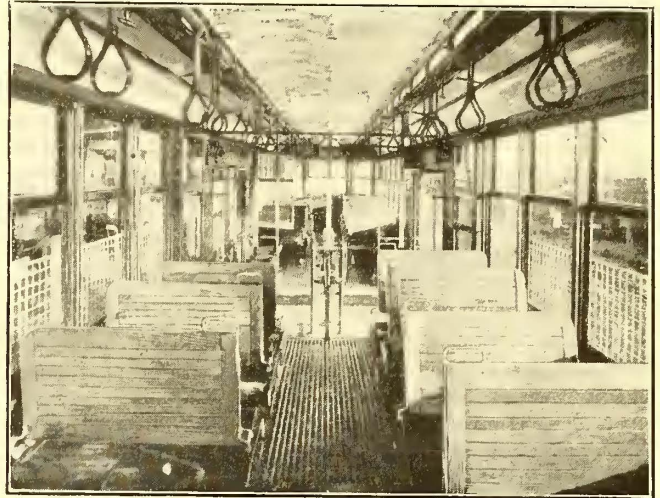
In operating these cars on the six lines selected, it was necessary to purchase property at two points and to install loops or loop connections at five additional points, making seven in all. An estimated saving of 18 per cent on the total expenditures for cars, track and distribution was calculated, and while the cars have not been in service for a long enough time to check this on a yearly basis, results to date indicate that, from the use of these cars, this saving will result. As increasing traffic demands the operation of greater trailer-car mileage, the savings made will increase, because of the lesser expense per mile for trailer-car operation. The trailers are equipped with standard HB lifeguards, which was decided upon after consultation with the Public Service Commission, in place of putting on a wood housing around the trucks.

The cars are 48 ft. 2½ in. long over anti-climbers, 8 ft. 4¾ in. wide over water table, side posts are on 2 ft. 5½ in. centers, and the height from rail to top of roof measures 10 ft. 11¾ in. The cars are equipped with 26 in. steel wheels and arch-bar trucks with inside-hung brakes and Gould type slack adjusters. The height of the first step into the well of the car is 15½ in. with a ramp of 1¾ in. From this well the height of the second step is 9¾ in., and from this step there is a ramp rising 4 in. from that level which brings the passenger to the general floor level of the car body. Two double sliding doors are located on each side of the center of the car and are operated manually pneumatic. The door entrances are provided with interlocking safety door control and motorman's signal light equipment, so that the cars cannot start until the doors are closed. These same connections were installed on the doors of the motor cars that were altered to haul the trailers. Hunter illuminated signs are installed over each center-entrance door, each sign with space for twenty-five destinations; signs are 48 in. wide.

CARS HAVE MONITOR DECKS

The cars are of the monitor-deck type with a white enameled finish for the ceiling. No headlining is used in the upper deck. Ten 36-watt Mazda lamps, spaced down the center of the car with special white opalescent globes, furnish night illumination, and with the white ceilings present a very agreeable appearance during the hours when artificial light is necessary. The push buttons and other signal lights are connected through the drawbar and operated by an Edison BI-H battery. This battery also operates the push button used by the conductor in signaling the motorman and the signal bell located on the motor car for the conductor's use.

As shown in the plan of the car, a four-sided stand is located in the center of the well and carries the fare box, with ample space for the conductor's signal bells and for door-operating handles. Upright stanchions are located in the middle of each of the door openings and three additional stanchions are located at each of the transverse sides of the well at the step leading into the body of the car. The control of the movement of passengers around the conductor's stand and in and out of



INTERIOR OF CENTER-ENTRANCE TRAILER

the car is had by means of chains and ropes attached to these stanchions, which can be adjusted as necessary to handle the traffic. Two stanchions are also located at each end of the car at the ends of the circular seats. The hand straps on the cars are fitted with Bakelite hand holds.

On each coupler is attached a box carrying five wires, one for lights and electric heaters, two for the signal system, one for the door interlock and one extra. An automatic device for preventing the coupler on the rear end of the trailer from becoming alive is provided, so that there is no current on the rear end of the trailer back of the entrance well.

The ratchet handbrake shaft is located in the well at the conductor's stand, out of the way of the passengers, but where it is of ready access in case of emergency. This is fitted with an Ackley adjustable brake. In addition to Johnson fare boxes, each trailer is equipped with an International R-7 register.

Give Careful Attention to Field Jumpers

ONE of the most common types of motor failures is caused by loose field jumpers. The cost of removing the armatures for repair of the jumpers is a big item of expense in addition to the damage caused by the loose field jumper itself. A very satisfactory method of treating the ends of the jumpers is to tin the various strands together and then to wrap them with a fine wire, then thoroughly tin again. A better method is to tin the strands together and then place a copper ferrule over them which should be very carefully soldered to the jumper. If this method is used the screw in the field terminal, which essentially should have a tight thread, will not come loose as readily as when the ferrule is not used since the strands of wire are apt to break apart and cause a loose lead and excessive heating, then burning of the motor lead or terminal and sometimes both, which results in a complete motor failure.

Changing from Left to Right Hand Operation

The Change of the Rule of the Road in British Columbia Introduced a Large Variety of Problems to the British Columbia Electric Railway, Ltd.

By W. G. MURRIN

Assistant General Manager, British Columbia Electric Railway, Vancouver, B. C.

IN ACCORDANCE with the highway amendment act of 1920 passed by the British Columbia Provincial Legislature the rule of the road was changed from left to right hand operation, the change becoming effective in the western portion of the province on Dec. 31, 1921. The eastern portion of the province was changed over on July 1, 1920. This change involves the British Columbia Electric Railway in a \$1,000,000 expenditure in changing over its rolling stock, tracks and overhead to permit of right-hand operation on its 368 miles of city, suburban and interurban tracks.

In order that the magnitude of the work involved in making this change-over may be understood I give briefly particulars, under the three headings of track, overhead and rolling stock, of what has to be performed and how we are doing it.

Track.—The following work will have to be performed in order to permit of cars and trains to operate right hand with the same efficiency, safety and convenience as they are at present being operated:

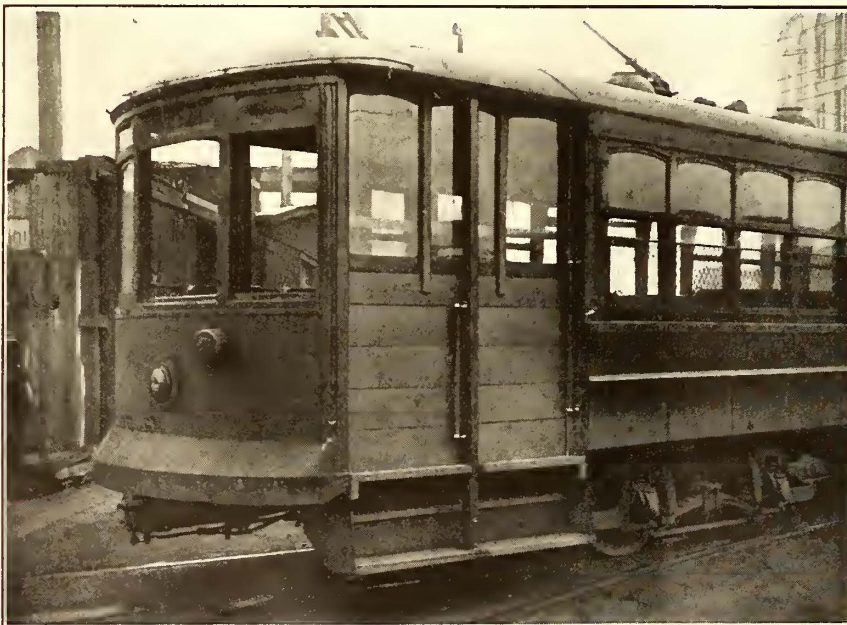
1. Take up and lay with new material forty-four permanent and twelve temporary cross-overs.
2. Take up and lay with new material seven permanent and one temporary Y layouts.
3. Change electric switches to adjoining tracks at nineteen different points.
4. Change position of eight derails.
5. Change spring switches.
6. Change elevation of certain portions of interurban tracks to permit of safe operation.
7. Change location of stations, shelters and platforms at thirteen points on double-tracked interurban lines.



CAR IN THE PROCESS OF CONVERSION. PLATFORM MUST BE CUT AWAY AND SUPPORT BENT TO ALLOW FOR STEPS. CHANGES ARE ALSO NECESSARY IN BULKHEAD DOORS

The permanent installations referred to above are in tracks constructed on paved streets, necessitating the pulling up of pavement, etc., and the relaying of this again following the track changes. The temporary installations mentioned are in tracks constructed on non-paved streets. The new track material and special work necessary to carry out the changes is now on order for delivery in December next. The installation, however, cannot be commenced until after the first of the year, when it will be proceeded with as speedily as possible. The estimated cost of track alterations that are necessary is \$416,902.67.

Overhead.—The overhead changes in connection with this problem are by far the lightest part of the work and are estimated to cost \$17,722. This covers cost of making all necessary changes to crossovers, electric switches, Ys, frogs, insulators, curves, &c., to permit of the efficient operation of the system with right-hand movement of traffic. Like the track changes, very little under this heading can be accomplished until after the change-over becomes effective.



ENTRANCE AND EXIT VIEWS OF THE BRITISH COLUMBIA CAR BEING RECONSTRUCTED

The view at the left shows the car fitted with right-hand doors. The boards shown are fastened so as to be easily removable when the change is made.

At the right, views of front end of car showing the good work of the master mechanic's department. Present left-hand door is still on the other side and will be taken off after change is made.

Rolling Stock.—Rolling stock changes constitute the major work and expense involved in this change-over and I know of no precedent by which we might be guided in carrying them out. There are 269 units to be changed over and made suitable for right-hand operation. These include 189 single-end cars, 73 double-end cars, 6 sweepers and 1 plow.

The above equipment comprises twenty different types of cars and each type requires special alterations suitable only to that particular class of car. The difficulties we have to meet in making the rolling stock changes will therefore readily be appreciated. Work has already commenced in making temporary alterations to Vancouver city cars and we expect by the end of the year to have practically all rolling stock units changed over in a temporary fashion ready for right-hand operation. These changes are being carried out with the least possible inconvenience to the traveling public and work is proceeding along the following lines:

Eight to ten cars at a time of a certain type are being brought into our Prior Street shops, located in Vancouver, where temporary alterations to front and rear vestibule are made as well as the installation of temporary steps on the right hand side of cars. The right hand side openings are then boarded up and the cars are put back into service. When the change-over is actually about to take place the services on all lines will be considerably reduced for a period of from one to four days, during which time the cars so released will be made suitable for right-hand use by removing the boards from the right hand side openings, above referred to, and tying up securely the gates or doors, of which all our cars are equipped, on the left-hand side. With this completed the cars will then be ready for service. When all units have been so changed it will be necessary systematically again to put all the cars through the shops, two or three at a time, when permanent alterations will be made, such as the installation of steps and gates or doors (to conform with government regulations), the installation of mechanism to operate same, as well as many other details too numerous to mention, but which can only be cared for after the change-over takes effect.

I estimate it will take approximately eighteen months or two years to put all the units through the shops and equip them permanently for right-hand operation in the same manner as they are at present equipped for left-hand operation.

The estimated cost of changing over our rolling stock units to conform with the change of the rule of the road is \$498,773.

The above expenditures for the three items of track, overhead and rolling stock when summarized are as follows:

Track alterations	\$416,902.67
Overhead work	17,722.00
Rolling stock	498,773.00
Total	\$933,397.67

The above figures do not include indirect losses in revenue which the company is bound to suffer from one cause or another for months following the change becoming effective, nor does it take care of increased accident costs, which will undoubtedly be high and which it is impossible to estimate.

Of the total figure quoted above the provincial government has agreed to contribute \$350,000.

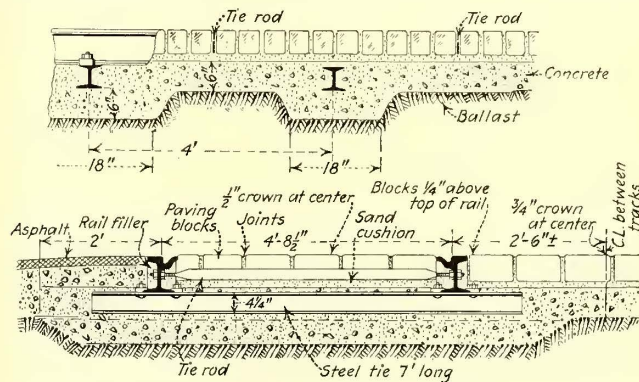
Unusual Method of Raising Track

Expediency Is the Keynote of the Method Which Was Used in a Track Grade Change on Lafayette Avenue in the Borough of Brooklyn

By R. C. CRAM

Engineer of Surface Roadway Brooklyn (N. Y.)
Rapid Transit Company

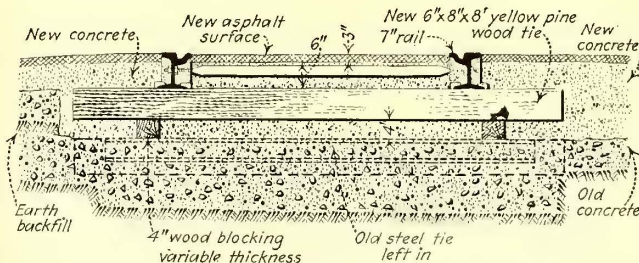
THE city of New York recently decided to widen Lafayette Avenue in the Borough of Brooklyn for the purpose of providing better facilities for automobile traffic. The avenue is very popular for through traffic and is occupied by two street railway tracks for a distance of about 800 ft. between Fulton Street and Flatbush Avenue. The roadway of the street was widened about 10 ft. on each side by setting back the curbs and removing all sidewalk encroachments. Inci-



SECTIONS OF TRACK IN LAFAYETTE AVENUE, BROOKLYN, BEFORE ADJUSTMENT TO NEW GRADE

dentally, a stairway leading to the elevated railroad structure on Fulton Street and two columns supporting the structure have been left as obstructions in the roadway outside the new curbs. A difference of opinion exists as to whether the railroad or the city should pay the cost of removing and relocating them.

The surface tracks in the street were built in 1907 and have been used principally as a relief line in rush hours and during blockades. As originally constructed the tracks were laid with 7-in. 114-lb. girder groove rail with Lorain electric bar-weld joints on Carnegie steel ties set in concrete and spaced 4 ft. on



RAISED SURFACE TRACK CONSTRUCTION

centers. Tie rods were spaced 4 ft. on centers between ties. The pavement between outer rails consisted of 6-in. granite blocks with cement grouted joints on a 1-in. sand cushion. The concrete track base or foundation was about 6 in. thick between ties and 12 in. thick at ties. The roadways were paved with sheet asphalt on a 6-in. concrete base in immediate contact with the outer rails.

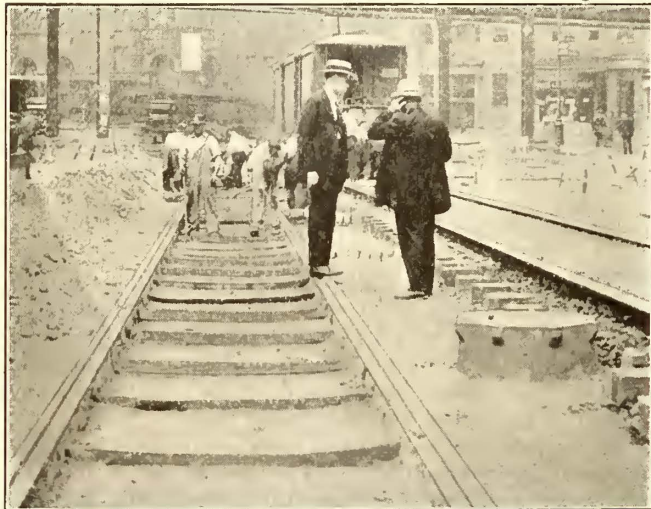
The new width of the street called for a raise in the grade of the tracks ranging from 6 to 10 in. and running out to meet existing grades at each end of the work

where connections are made with tracks in Fulton Street and in Flatbush Avenue. The railroad was confronted with the problem of how to raise the tracks in a minimum of time and expense as the contractor for the city was proceeding with his work and the railroad was very short of funds.

ADJUSTMENT AND REPLACEMENT OF ORIGINAL CONSTRUCTION TOO COSTLY

It appeared at first as though it would be necessary to break out the concrete track base, raise the steel ties and resurface the tracks to the new grades on new concrete, as in the original construction. Estimates indicated that this would not only be a costly procedure but also would require a great amount of time in order to permit a new concrete track base to set properly. This in turn would have put the tracks out of service too long and would have caused considerable delay to the city's part of the work.

It was also suggested that the entire old construction, concrete, ties, rails and pavement, might be raised bodily by jacking it up in convenient sections. This would have been a slow and expensive procedure, as it would



WORKING ON SECOND TRACK PRELIMINARY TO RAISING

have required extensive cutting of old concrete, and considerable doubt was felt as to whether it would have been possible to install a new bed of ballast under the old concrete in a manner that would insure against future settlement. Extra filling material for this would have been required also.

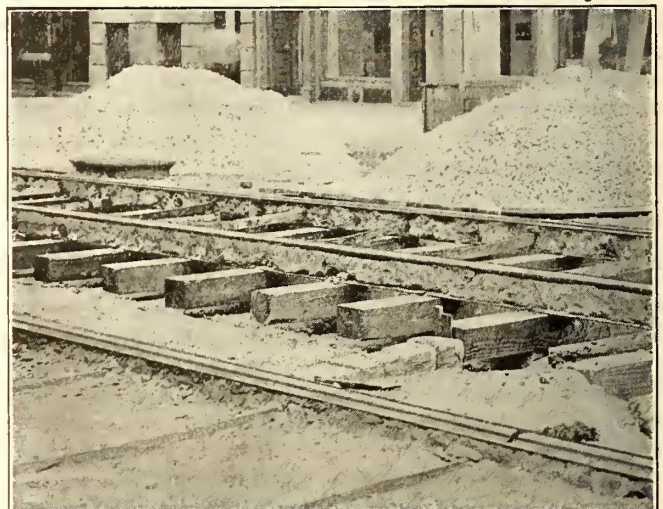
The method adopted was pursued after a careful consideration of the amount of grade change or lift. This was sufficient, except at the run-offs on each end meeting existing grades, to permit the installation of new wood ties on 30-in. centers either directly upon the old concrete track base or by blocking under the ties resting on the old base.

The original concrete which was under the old asphalt pavement in the 2-ft. strips outside of the outer rails was broken out by air drills operated from an air compressor car normally used for sand blast work in connection with cast welding operations. This was the only concrete which had to be removed as the city contractor had left it in place because it was below the subgrade of the new roadway pavement. Its removal was necessary because it prevented the installation of the new wood ties. The existing track pavement was removed by the city contractor.

The removal of the pavement practically exposed the tie-clips and these were removed by cutting the hold-down nuts. The rails were jacked up and new wood ties installed, the old concrete base and steel ties being left in place.

After a fair stretch of track had been raised it was blocked to grade ready for installation of a new concrete base. The latter was then tamped under the new ties so as to transfer the bearing directly to the old track base. In the short stretches where full ties could not be installed near the run-off points, the top surfaces of the ties were adzed sufficiently to allow the rails to set down to grade and special shortened spikes were used to fasten the rails. At the run-off points in the grades the rails were simply blocked on the old wood ties, which fortunately were found here due to their use under the special trackwork at the ends of the job. It was unnecessary to disturb any original ties whatever, either wood or steel. The original tie rods were left in place.

The city replaced the original granite pavement with sheet asphalt on concrete between the outer rails. Consequently the new concrete was brought up to within

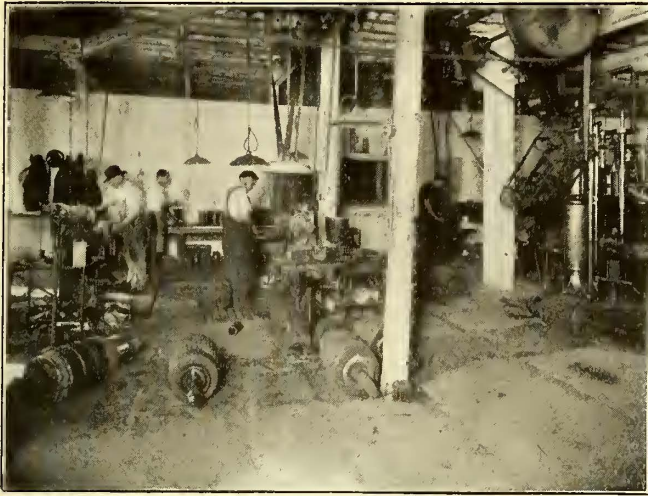


ONE TRACK RAISED INTO POSITION ON WOODEN TIES

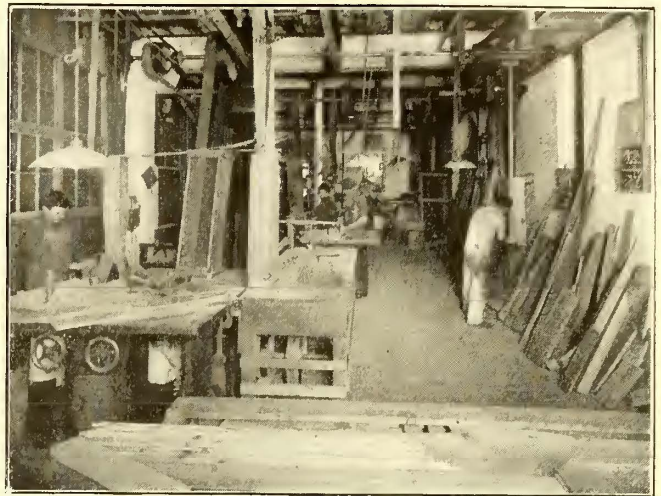
3 in. of the tops of the rail heads. This in turn provides a new concrete base about 16 in. thick under the asphalt pavement surface between ties with the addition of another 6 in. in the old concrete track base, so there is a total of 21 in. of concrete. Wood blocking of variable thickness was used between the old and new ties and the intervening space was filled in with new concrete, the average thickness of the concrete being 4 in. All of the concrete work was done by the city contractor.

The bar-weld rail joints were found to be in perfect condition and bid fair to last during the remaining life of the track. Such of the steel ties as were exposed for examination were found to be in very good condition.

The accompanying views show the general features of the work. It is thought that this is the first time the procedure outlined has ever been undertaken. Only the work of raising the tracks and tamping concrete under the ties was done by the railroad company. This took a gang of sixteen men about ten days to complete at a cost of \$0.52 per foot of single track for labor only. About 454 cu.yd. of new concrete was installed in the railroad area by the city contractor.



A CORNER OF THE MACHINE SHOP



THE WOODWORKING SHOP IS FULLY EQUIPPED

Providing a Repair Shop with Little Money

The Eighth Avenue Railroad of New York City Has Rearranged and Reconstructed Its Carhouse to Make a Repair Shop and to Give Better Facilities for Carrying on the Work

BY C. P. WESTLAKE

Supervisor of Equipment, Eighth Avenue Railroad, New York, N. Y.

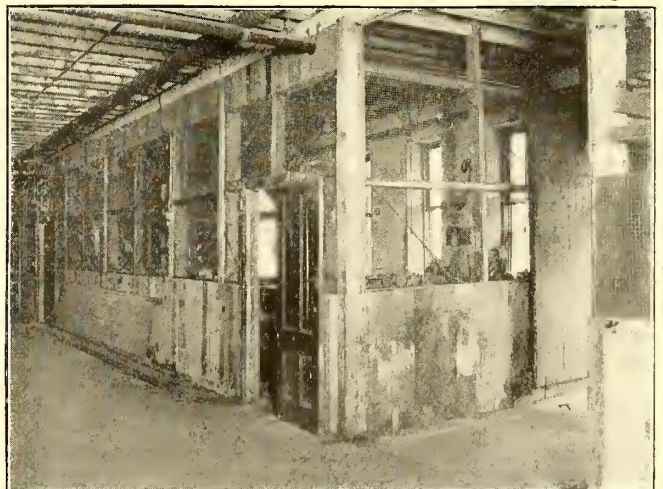
THE difficult problem of reconstructing an old carhouse to provide facilities for equipment maintenance and the adding of desirable improvements has received much attention for some time past by those in charge of this work for the Eighth Avenue Railroad, New York. The accompanying illustrations show some of the departments as arranged. The building at the corner of Eighth Avenue and Fiftieth Street, which is now being used for overhauling and maintenance repair work, was a combined carhouse and stable during horse-car days. The small openings originally at the head of stalls were entirely inadequate to give the necessary light for railway repair work, so these were enlarged and sash and glass were installed. Walls and partitions were added and changed and the various departments were located to provide an efficient routing of the work through the shop. Realizing that shop capacity is materially increased by an efficient grouping of departments and by the efficient arrangement of the equipment in each department, a special effort has

been made to place departments and machines in the logical order that a piece of equipment will take when repaired. Thus the blacksmith shop, the welding room and the babbiting room follow each other in the order named. The armature repair department is adjacent to the machine shop and lathes in the machine shop used for turning commutators, and finishing shafts, bearings and banding armatures are placed nearest the armature room. A portable shop crane is used to handle the armatures from the armature room to the lathes. Passageways and aisles have been kept as wide as possible to give free movement and prevent blocking and delaying of material handling.

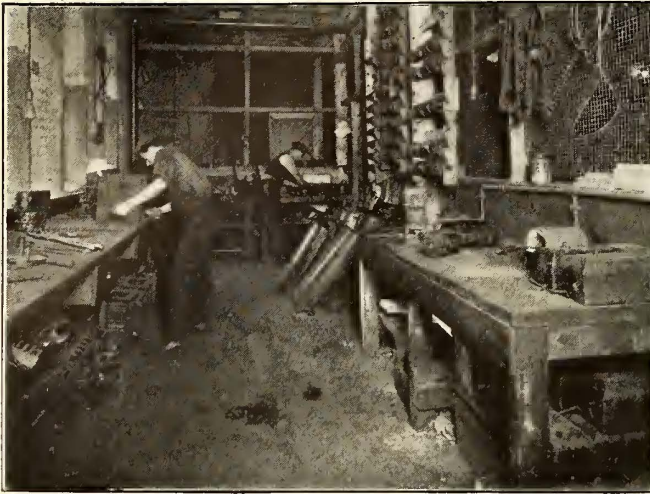
Believing that better work and more of it can be produced by eliminating interference and the distraction caused by doing too many kinds of work in one room, each department has been partitioned off and localized as much as possible. These partitions are closed from the floor to a height of about 3 ft. and above this wire netting is used. This arrangement gives efficient light-



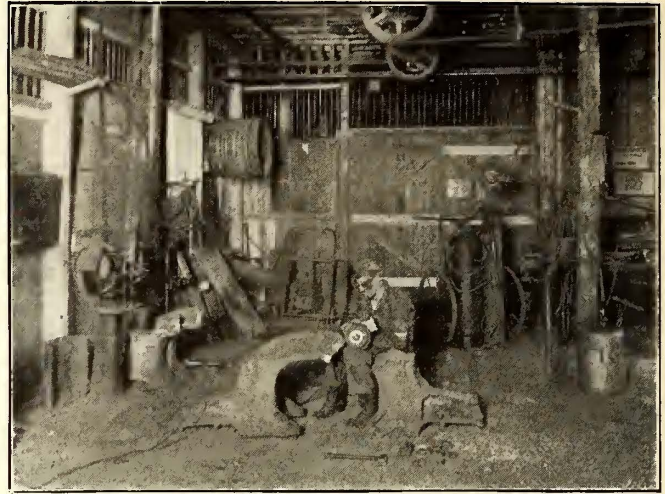
RACKS AND BINS ASSIST THE STOREKEEPER



PARTITION CONSTRUCTION USED FOR SEGREGATING DEPARTMENTS



THE CONTROLLER OVERHAULING DEPARTMENT



GRINDING A LARGE CASTING PRELIMINARY TO WELDING

ing and ventilation and permits ready inspection from the outside of the work being done. The various workmen like the privacy given by this arrangement and as each department can be locked it is unnecessary for the men to clean up and put away their tools at lunchtime or quitting time. They can continue their work right up to the moment of leaving and by locking the door to their department they are assured that there will be no interference during their absence.

Accompanying illustrations show the construction used and the interior arrangement of the controller repair department and the welding department. Benches are constructed along the walls in the controller department for carrying on the work. The bench in front of the windows is used for dismantling, repairing and reassembling of grid resistors and the various controller parts. A bench along the outside partition is provided with gas connections for heating solder and the soldering irons. A rack is also provided for the storage of controller drums. The bench at the end of the room is used for wiring and connection board repairs.

The equipment of the welding room includes machinery for assisting in welding repairs such as grinders and a small drill press, in addition to the oxy-acetylene and electric welding equipment and preheating torches. The illustration of this department shows a workman grinding the broken edge of a box yoke for the underground conduit system preparatory to welding. A portable electric grinder has been found of great

assistance for this class of repairs. This department has an outside door so that heavy castings can be handled directly from the street to the welding room.

Other departments which are provided with separate rooms include those for curtain and seat repairs, compressor overhauling, register and fare box maintenance and the contact plow work.

HIGH CLASS WORK IS TURNED OUT

As an example of the type of repairs being made accompanying illustrations show one of the Ninth Avenue cars just after being remodeled and repainted. The seating arrangement of this car consists of longitudinal seats. These originally had carpet covering and this was changed to rattan. Before remodeling, the windows had shutters. These have been removed and curtains installed in their place. In order to give better illumination the ceiling has been white enameled and lights previously located on the platforms have been brought inside the car. A full equipment of sanitary hand straps has also been added. Originally a block destination and routing sign was used on top of the end hood. This has been removed and the end clearstory glass is lettered. This arrangement gives a brighter and more pronounced appearance for the car at night and is of assistance in decreasing the number of accidents. The car body, trucks and various equipment parts were given a thorough overhauling. Rotted posts and damaged panels were replaced and all parts put in serviceable condition.



EXTERIOR OF CAR FRESH FROM THE SHOP



A BRIGHT, CLEAN INTERIOR ATTRACTS PASSENGERS

Selling the Ride at Youngstown

How the Youngstown Municipal Railway Used the Inauguration of a Weekly Pass to Cultivate the Good Will of the Public Through Greater Usefulness—An Account of the Publicity Campaign Is Presented

A GREAT deal is being said and written nowadays on the subject of "Selling the Ride." A street car ride in itself generally is not a novelty. Hence the best opportunity for a sales campaign must lie either in the introduction of new rolling stock or some novel departure in the rate of fare. In the case of the Youngstown Municipal Railway, the sales campaign hereinafter described was based upon the trying out by the company of the unlimited-ride, transferable weekly pass first used at Racine, Wis. (See ELECTRIC RAILWAY JOURNAL, Jan. 3, 1920, and Aug. 6, 1921.) The present article will deal only with the selling arguments used at Youngstown and not with the technical aspects of the pass. The intention is simply to show what opportunities lie open to an electric railway when it pushes any plan of securing more revenue from a larger rather than a smaller number of riders.

TWO-FACED CAR WINDOW CARDS EXCEPTIONALLY EFFECTIVE

The Youngstown Municipal Railway, while forming a part of the Pennsylvania-Ohio Electric Company, of which G. T. Seely is general manager, is segregated from the rest of the system by a service-at-cost agreement with the city of Youngstown. It was therefore necessary first to sell the City Council on the idea. During September the Council passed a resolution granting the Youngstown Municipal Railway the right to put on such a pass at \$1.25 each for a period of eight weeks with the option of continuing it thereafter if found satisfactory.

The pass was to become effective Monday, Oct. 3, but the advertising campaign began two weeks ahead. During the first week of the pre-pass period the company's publicity, aside from some news items, was confined to double-faced window cards, one on each side of the center window of every car. The side of the poster facing the walker, the jitney customer and the automobilist carried in circus-size type the continued slogan "Ride All Week for \$1.25," followed by these two lines in somewhat smaller type: "It's Cheaper Than Walking—Buy a Weekly Pass." This may seem as plain as the proverbial pikestaff, yet it is a fact that some people read the slogan in the light of their regular traveling habits and had the notion that the pass covered only two rides a day six days in the week.

This fact is mentioned to stress the fact that repetition of explanations is a large factor in advertising to a miscellaneous public.

The inner side of the first window card, being readable by most of the passengers in the car, carried a more elaborate message, headed: "\$1.25 Pays for All Your Riding for a Week," as reproduced on this page. This told the rider the exact time limits within which the pass is good, although there is actually some grace on Sunday night late runs ending Monday morning, and it suggested a number of ways for which the extra non-rush riding could be taken, such as luncheon, theaters, parks, tradesmen, social visits, short or long ride, etc.

It is a fact that these two-faced cards created a lot of comment and had many people "guessing" in the

**RIDE ALL WEEK
FOR
\$1.25**

**It's Cheaper Than Walking
Buy a Weekly Pass**

**RIDE ALL WEEK
FOR
\$1.25**

**Buy a Weekly Pass and Ride
as Much as You Please**

**Ride All Week
for \$1.25**

You can buy your street car rides in a new way which will give you UNLIMITED SERVICE and will SAVE YOU MONEY.

You can begin to use the new system any time after midnight of Sunday, October 2. At that time the new WEEKLY PASS will go into effect.

It costs only \$1.25 and is good for as many rides as you want to take for an entire week—Sunday midnight till the following Sunday midnight.

It is good for any ride within the city fare limits at any time of the day or night. No bother with transfers or making change—just "hop on and ride."

**On Sale by Conductors and at Offices
on and after Friday, September 30.**

**\$1.25 Pays for All Your
Riding for a Week**

Don't fail to avail yourself of the chance to ride wherever you want to go for seven full days from Sunday midnight to Sunday midnight for only \$1.25.

That's what the new Weekly Pass means to you.

You spend that much for riding to and from work anyway. Buy a Weekly Pass for \$1.25 and you can RIDE FREE—

To and from lunch at home every day.
To the theatres, or the Park, any evening.
To visit friends in any part of the city.
To go to and from the big stores downtown.
To the butcher's and the grocer's.
For a square, or for mile—anywhere at any time—
ALL YOUR RIDING FOR \$1.25

**On Sale on and after Friday, September 30.
In Use after Midnight of Sunday, October 2.**

FRONT AND BACK OF WINDOW CARDS ADVERTISING UNLIMITED RIDE—WEEKLY PASS. THE LARGER TYPE FACES THE STREET, WHERE IT CAN BE READ BY WALKER AND AUTOMOBILE RIDER

most approved manner of the advertising expert. Later window cards followed the same scheme of a short, poster-type message to the outsider and a more extended story to the insider. Thus, the second poster read: "Ride All Week for \$1.25; Buy a Weekly Pass and Ride as Much as You Please," while the new note on the inner face was to the effect that a pass rider had: "No bother with transfers or making change; just 'hop' on and ride," the remainder of the text being as reproduced.

A third poster carried the outside message: "Ride All Week for \$1.25—Passes Now on Sale—In Use from Monday, Oct. 3," the inside story detailing some of the ways in which the pass could be used to add to the

patron's pleasure or to save his or her time. Once the pass was actually on sale three days before Oct. 3, a new window card announced: "Buy Your Pass Today—Ride All Week for \$1.25—Use Starts Monday, Oct. 3," with the usual elaboration for passengers within the car.

These window cards were varied not only in text but in color. Thus three different shades were used for the first four, so that the public could see out of the corner of its eye that there was a new message to read.

While the car cards were both effective and economical, they did not reach with any detailed explanation those people who were not riding the cars or the many Youngstowners to whom English is still a puzzle. For these classes a series of newspaper advertisements was prepared, each carrying the slogan "Ride All Week for \$1.25," but with different text for each day of the week immediately preceding the pass and for the Monday on which the pass was inaugurated. The display type and make-up of each advertisement were also varied, including box heads to summarize the principal features of the pass and reproductions of the face of the pass. As some of these are reproduced, it will be unnecessary to quote the text at length. The one for Thursday, Sept. 29, is presented, however, as showing that the principal department stores of the city had agreed to put the pass on sale during the inaugural period and also as detailing how different classes of the community could use this form of transportation to advantage.

Quarter-page (approximately) announcements were used the first few days, the space being cut down as the message was driven home. On Sunday, Oct. 2, people were asked to "Buy yours today as you go to church," although this pass would not be available until the following Sunday. It may be remarked, parenthetically, that the use of the pass for this purpose is reported by

local divines to have had a stimulating effect on their attendance figures! The final newspaper advertisement in English, appropriately headed, "It's Not Too Late," appeared on Monday, Oct. 3, the day the pass began working. It contained an acrostic as follows:

R to and from work,
home to lunch every day,
I to the stores to shop as often as you wish,
to the theaters and moving pictures,
D to the night school or the "gym,"
to visit friends in any part of the city,
E to market, to the grocer's, to the baker's.
back to the office for a bit of night work,
where you please, when you please.

In addition to the newspaper advertisements, there were several articles about the pass and its value from the standpoint of giving to the public the fullest possible use of the electric railway's facilities. It was declared in these articles that the company's ideal was the full seat and the empty sidewalk, and emphasis was placed upon the fact that while the railway is overloaded for a couple of hours a day it has more than enough service for the rest of the service periods. The articles made clear that while it was out of the question to cut rush-hour fares, something could be done for those who were willing to patronize the road for short rides or during the many light hours.

A like line of advertising and reading copy was prepared for the foreign language weeklies and labor papers. The foreign matter was printed in Italian, Rumanian, Hungarian and Slovenian and undoubtedly helped to increase good will among classes which had been prone to patronize the jitney. This copy was run but once or twice to the extent of quarter pages.

It is a rather interesting fact that the revenue of the Youngstown Municipal Railway showed a pleasing increase during the week that advertising was most exten-

Move to the Movies
No Carfare to Pay
WITH THAT
\$1.25 Weekly Pass

Any Car
Is Your Car
With That
Weekly Pass
\$1.25

SHOP
When You Want
Where You Want
ON THAT WEEKLY
PASS-\$1.25

Passes Save Many Steps
They are proving a great convenience to many car riders, who can ride where they want and when they want, with no additional fare to pay.
"Formerly I never went home to lunch", said one man. "Now I use a pass and go home to lunch nearly every day. It costs me nothing for the extra rides."
"I forgot my magazines and papers the other evening", said another, "and I wanted to read. I used my pass to go down town and soon was back with reading matter to spend a pleasant evening."
If you have not joined the Unlimited Ride Club, buy a Weekly Pass for \$1.25 and "hop on" a car whenever you like.

Face to Face Shopping
Whether for Silks or
Cabbages, Is Best
Use your Weekly Street Railway Pass to go frequently to the stores—to the markets—to the butcher's, the grocer's, the baker's. See for yourself what you want to buy. Help cut down costs by carrying home your purchases.
Shop when you want, where you want, without walking or telephoning by using your Weekly Pass.
Board any car, at any time, at any stop for any ride without paying fare by simply showing the conductor your Weekly Pass.

NO BOTHER ABOUT A PASS
WHEN you use a \$1.25 Weekly Street Railway Pass you save yourself all the bother of making change, of handling transfers and the like every time you ride. Just show the pass to the conductor—that's all there is to it.
Use it as often as you like in the week. Send that boy or girl on an errand with it. Go where you like in the afternoon or evening. Ride to the football game on Saturday afternoon.
Then as the week for the pass draws to a close, use it for the best purpose of all—to ride to church and Sunday school. It is good for you to go to church and the Weekly Pass is good to take you there.
Ride All Week For \$1.25

ON THIS AND THE OPPOSITE PAGE ARE GIVEN SEVERAL EXAMPLES OF THE WINDOW CARDS, BOTH OF WHOSE SIDES WERE USED TO SELL THE IDEA OF THE WEEKLY PASS

sive and before the actual use of the pass, which suggests that this publicity may have played a part in promoting riding.

TALKING TO THE BUSINESS MEN INDIVIDUALLY AND EN MASSE

Publicity for the pass was by no means limited to the printed word. The co-operation of influential elements of the community having a direct interest in more riding was also sought and obtained. Calls were made on the proprietors or managers of the larger department stores. It was explained to them that the new form of transportation was based upon inducing people to do more riding during the non-rush hours. Anything that brought the women out of their homes down to their stores deserved their encouragement. They were keen to see the point and were ready to listen further and help. As a result, all the stores called upon placed the passes on sale at a prominent desk during the initial period and some went so far as to give part of their advertising space to selling notices in the style of the Liberty Loan days.

Late in the afternoons and evenings most of the moving picture houses and theaters were visited. Some of these had recently been obliged to cut the cost of their entertainments to as low as 10 cents, and even better-grade houses were on a 22-cent and 33-cent basis. It can readily be seen, therefore, that a 9-cent cash or 8½-cent ticket fare on the cars would appear out of proportion to the average person. With a pass, the cost of seeing the shows would be reduced to nothing, or, at any rate, the pass-holder with a companion would have to pay but one round-trip fare instead of two.

Several of the theatrical men interviewed offered to place passes on sale, but this was not considered desirable as there were no facilities for carrying on a large

sale through outside agencies. It was explained that, except for the introductory sales by the larger stores, passes would be sold only by conductors and at the company's main downtown waiting room. All that was asked of the moving picture men was the display of a slide with a few catchwords to the effect that the holder of an unlimited-ride weekly pass could see the next show without paying fare or send one of the family down on the pass if he did not come again himself.

Calls were also made upon the directors of the Y. M. C. A. and the Y. W. C. A. The night schools of these organizations are attended by several hundred young people who can ill afford to pay an extra set of fares in the evening. It follows that many walk, so tiring themselves or losing time at best. As possessors of a pass they would save time coming and going, and they can, as the Y. M. C. A. director suggested for a poster slogan, "Take their exercise in the 'gym.'" At both buildings passes were sold during the introductory period.

Finally, permission was granted to address the Kiwanis Club on this subject. The relationship which increased riding bears to greater local prosperity was emphasized. The point was made that the local management was willing to try a plan for getting more revenue from a larger number of satisfied instead of from a smaller number of dissatisfied customers, and that this was after all an endeavor to apply correct selling principles in offering a reduction to the customer who paid in advance, purchased in wholesale quantities and used the product largely at a time when it would otherwise go to waste.

It was, of course, essential that the men who sell the ride directly—conductor and motorman—should understand the company's purpose in trying the pass. Knowledge of human nature also made it desirable to show in how many ways the conductor's work would be simplified

FIFTY RIDES A WEEK

**More If You Wish
With That
Weekly Pass
\$1.25**

Join the Unlimited Ride Club

**Ride All Week
for \$1.25**

**GO TO CHURCH
and
Sunday School
On That
WEEKLY PASS
\$1.25**

PASS THE PASS ON TO ONE OF THE FOLKS

The Weekly Street Railway Pass will take you to and from your work and give you all the other riding you want in a week.

Then when you are home in the evening, Saturday afternoon or Sunday, it is good for some other member of the family to go shopping, to go visiting, to go to the movies, to go wherever anyone wishes to go.

Your wife, your son, your daughter, your brother may have a use for the Weekly Pass when you do not need it for yourself.

**RIDE ALL WEEK
FOR \$1.25**

Ride to Night School

ARE you a student at the "Y" or at business college? Then, of course, you want a Weekly Pass. It will take you to and from work and then in the evening to school and back again, and wherever else you want to go.

DO YOU GO SHOPPING?

Use a Weekly Pass and go to the stores as often as you wish without extra cost.

Use it in the evening to go to the "movies", to the theatre, to visit friends, wherever you wish, whenever you wish.

All your riding for a week, Monday to Sunday inclusive, for \$1.25.

Don't Walk a Block with Those Bundles

EVEN though you have only a short distance to go, board the first car and ride with that \$1.25 Weekly Pass. Your carefare is paid for all the rides you want to take, long or short, when you carry a pass.

No need to trudge through the wet. We have had many rainy days, and there are more to come. Get out of the wet and into the dry with that Weekly Pass.

The Weekly Pass is your membership card in the Unlimited Ride Club. Any car is your car and it is always cranked up for you when you carry a pass.

**Go to the Movies Tonight--Your
Carefare Is Paid**

and schedules improved by a plan that eliminated so much making of change and issuing of transfers. The company might have tried several other ways, it was explained at the meetings, but this had been favored because it had so many elements that should also appeal to the platform man. Much interest was shown at these sessions, a number of the men asking searching questions or offering valuable suggestions with regard to identification of the pass from week to week, etc. There was evident appreciation of the fact that they had been taken into the management's confidence on the matter instead of being left to guess for themselves what the innovation meant to them and to their patrons.

In the preparation of articles and advertisements featuring the pass Walter Jackson co-operated with Frank Wert, the company's director of public relations, and gave talks to the townspeople and platform men.

As with the merchant, who finds new arguments for the same goods year in and year out, so the electric railway can vary its appeal, too. In connection with the pass there have been prepared a variety of slogans

New Station on Chicago Elevated

TO PROVIDE for a new station at Grand Avenue on the Franklin Street line of the Northwestern Elevated Railroad, Chicago, it was necessary, says *Engineering News-Record*, to raise the rail level 5 ft. and to replace the original deck span across Grand Avenue by a through span with shallow floor in order to obtain headroom for placing the station under the structure and with a clearance of 14 ft. above the street. This change in elevation involved changing the profile for a distance of about 1,100 ft., so that instead of being level it has grades of 1.2 per cent, with the track level through the station.

All the work of raising the structure was done during the daytime and without interference to traffic of the elevated lines or in the street, except that the timber bents blocked the sides of the roadway. The work of jacking began at both ends and was carried out on one bent at a time, with an average lift of 2 in. at each operation. The total lifts for each cross

Vegyén Heti Villamos Jegyét és Egész Héten Utazhat \$1.25-ért

Pentektől kezdve egy hétre szóló villamos bérletet lesemek kaphatok. A bérletek vasárnap éjféltől lépnek életbe és pontosan egy hetet később lejárnak. A bérlet ára egy hétre \$1.25 és hétfő hajnali 12 óra 1 perctől vasárnap éjféli 12 óráig érvényesek.

Minden heten új jegyek kerülnek eladásra. Mindig hasonló időtartamra fog szólni.

A bérletjeggyel akárhányszor utazhat egy hétig a 9 centes viteldíj zónán belül, éppen úgy mintha készpénzt vagy jegyet fizetne egyes utakat. Kettőn nem utazhatunk egyszerre egy bérlet jeggyel. De az nem névre szól és bárki használhatja.

A bérletjegyeket mindig penteken, szombaton és vasárnap fogják árusítani a következők hétre.

Azok, akik nem váltanak bérletjegyet az eddigi viteldíjakkal fogják fizetni.

- THE YOUNGSTOWN MUNICIPAL RAILWAY

MONDAY, OCTOBER 3, 1921

Trey's A 7-Inch Wear-Ever Aluminum Fry Pan for only **49c** (McKee's - Basement)

Weekly Street Car Passes Can be obtained from the Cashier—Third Floor.

ing Orders or

Your Opportunity to Buy A Trunk or Traveling Bag

top. Very special at... (Main Floor, Hazel St. Annex) **1**

Bags and Purses—Collection of real leather and silk bags and purses in black and colors, many styles and sizes; regularly up to \$3.00. Tomorrow, choice... **\$1** (Main Floor, Old Bldg.)

Begining tomorrow Street Railway Weekly Passes **\$1.25** May Be Obtained At Our Postoffice Station

—Now you can shop just when you want and for just what you want, without walking or phoning, by using these Passes. (Main Floor, Hazel St. Annex)

lar Day, pair... **1** (Main Floor, Old Bldg.)

Women's Oxfords—Just 60 pairs for an extraordinary Dollar Day Special tomorrow! Tan and black Russia (Calfskin); covered Cuban heels, strictly bench made models; comfortable as well as serviceable. Tomorrow, Dollar Day... **\$5** (Second Floor, Old Bldg.)

Ride All Week for \$1.25

Weekly Passes On Sale Tomorrow

THE new Weekly Street Railway Pass will soon be at work saving you time and money, and adding to the convenience of our service for you. It will be good for as many rides as the holder wants to take, beginning Monday—that is immediately after midnight Sunday—until midnight of the following Sunday.

The pass will be on sale beginning tomorrow of their patrons the pass also office in Central Square. For the convenience of their patrons the passes also will be on sale at the following department stores:

The G. M. McKelvey Co.
The Strauss-Hirshberg Company
The Geo. L. Fordyce Co.
The Central Store
The B. McMahon Co.
The Collier-Kane Co.
Class. Livingston & Sons

Get Your Pass Tomorrow

From usage at Monday. See for yourself how much time and money this new system of selling street car rides will save you, and how much it will add to your convenience.

It will pay you, Madam Housewife, to have Weekly Pass. All the stores offer special bargains from time to time. With your pass you can never determine as often as you wish and see for yourself how much money they can save you.

It will pay you, Mr. Workman, to have a Weekly Pass. It costs you only \$1.25, no more than you pay each week to ride to and from your work and for one or two other ordinary trips. With a pass in your pocket, your riding is paid for to go where you please, when you please.

It will pay you, Mr. Business Man and Mr. Office Worker. With a pass you can go to work every day, if you wish, and, in going to and from during the day on business, even if it is a matter of only three or four blocks, you might as well ride when there is an additional fare to pay.

It will pay you, Everybody, because the pass is always ready for you to use, and not a cent to pay. To go to the meeting, picture, the theater, to visit a friend or to take any pleasure trip you wish.

Whether you want to go only a square or two, or for several miles, your Weekly Pass will take you. Buy yours early and ride often.

The Youngstown Municipal Railway Co.

VARIOUS FORMS OF PUBLICITY ADVERTISING THE PASS

In center, portions clipped from advertisements of dry goods houses, used in Youngstown showing free space given to the pass. At left, newspaper advertisement of the railway company, which was published the Thursday preceding the first week in which the

pass was sold. It includes a reproduction of the ticket and the names of the principal stores in the city at which it was being sold. At right, one of the persuasive advertisements prepared by Frank Wert, director of public relations.

suitable to the different seasons of the year and carrying no more words than enough to make an effective window card, dasher poster, newspaper box head or the like. The Youngstown Municipal Railway has already made use of several in connection with earlier copy and expects to run others from time to time. Of course, many opportunities will arise for making up a slogan on the spur of the moment, as in suggesting: "Go to the Circus on Your Pass."

So far as practical results from the pass are concerned, it is held to be too soon to quote detail figures. However, it is encouraging to learn that comparing the first three weeks of the pass with the three weeks preceding, the rate of increase in revenue on the lines within Youngstown was more than twice as great as on the city lines outside Youngstown, on which no passes are sold, although industrial conditions on these outside lines were at least as good as within the city.

girder was chalked upon the column and no girder was raised more than 2 in. at a time.

As fast as the jacking proceeded the cribbing was built up and wedged tightly under the column base and the timber bent, thus keeping the structure in proper alignment and in stable condition. For additional lateral support to the structure heavy timber inclined braces were set near the cross girder in alternate spans, with their lower ends butted against blocking made along the face of the curb and their heads to fit the bottom cords of the longitudinal girders. In lifting about thirty men were employed to work on the jacks and to build up the cribs and wedging. A day's work averaged an aggregate lift of 6 ft. and the lifting occupied about twelve working days. Lengthening of the columns was effected in most places by removing the old column footing or shoe and splicing on a new bottom section which fitted into the old shoe.

Equipment and Its Maintenance

*Short Descriptions and Details of New Apparatus of Interest
to the Industry. Mechanical and Electrical
Practices of All Departments*

Auger Attached to Motor Truck

Earth Boring Machine on Motor Truck Speeds Up Line
Construction—Driver Operates Mechanism From His
Seat on the Truck

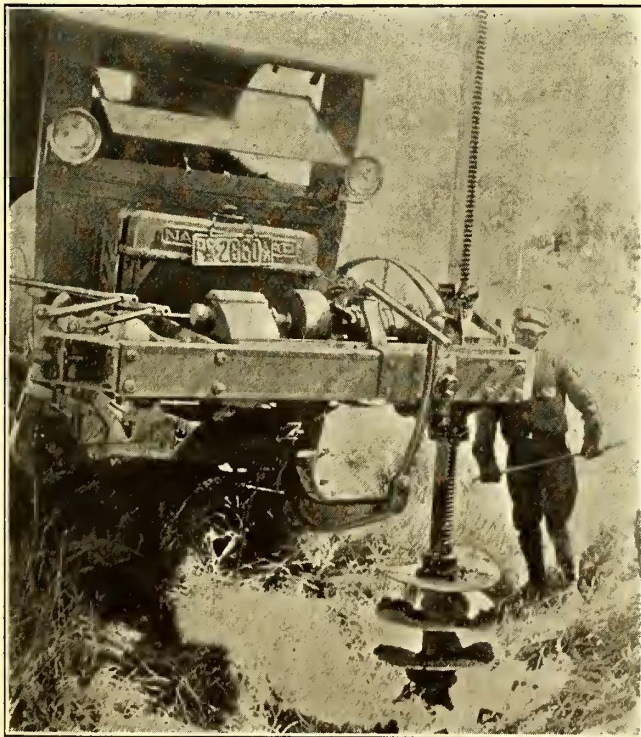
AN AUGER suitable for boring in earth, attached to a motor truck and driven by the truck engine, has been used with good results in California, according to the Pacific Telephone & Telegraph Company, which has four of them in service. The device weighs about 1,800 lb. and can be dismantled in a few hours so the truck can be released for other uses. It makes holes 22 in. in diameter and under average soil conditions can bore a 6-ft. hole in seven minutes.

The device is mounted on the front end of the chassis, preferably on a truck having four-wheel drive, as it is sometimes desirable to traverse plowed fields, irrigation ditches, etc. The auger consists of two replaceable cutting edges, placed at about the same angle used in standard drills, and is driven by a shaft from the power take-off in the truck transmission. In a truck having four speeds and a reverse this arrangement makes it possible to adapt the speed of the auger to soils of different nature, such as adobe, clay, sand, hardpan, etc. A wide range of auger speeds has been found highly desirable. In hardpan, for example, the auger must be turned slowly to prevent the edges from being burned.

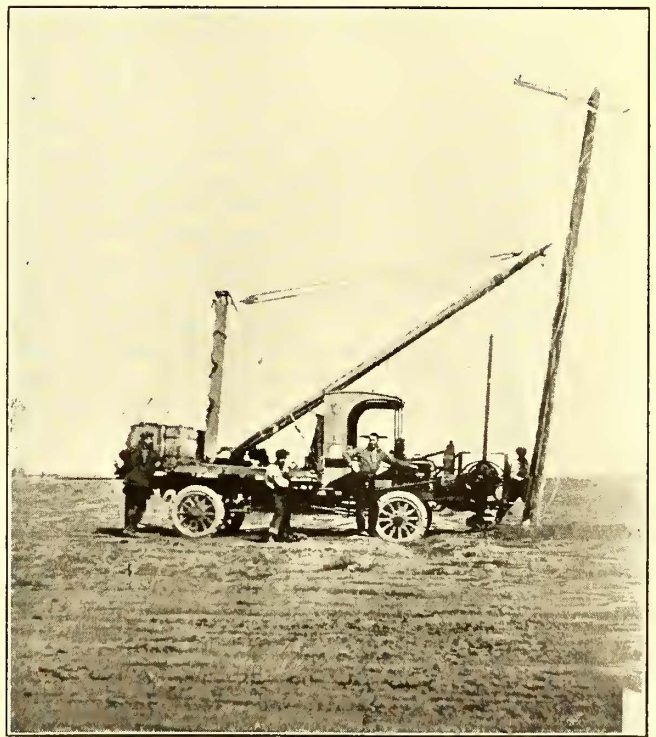
The mounting of the boring machine is such that it is possible to bore a vertical hole with the truck standing on any grade it can climb; it is also possible to bore holes at any angle up to 45 deg. when the truck is on the level. The auger is located on the left-hand side of the truck where it is in plain view of the driver. The controls are within easy reach of the driver's seat so he can operate them without changing his position.

When ready for operation the point of the auger is spotted on the surveyor's stake, the truck brakes are set, the compound gear of the truck is shifted into neutral and then the clutch on the earth boring machine is let in gently. The auger feed is either by hand or by gravity. The former, which is used chiefly on inclined holes, is effected by means of a rack on the auger shaft and pinion operated by hand lever. When the auger has buried itself a second clutch lifts it until the lower side of the auger is clear of the ground, when it is turned at a high rate of speed to discharge its load and throw the soil clear of the hole by centrifugal force.

A feature of the auger gearing is that in case of any sudden resistance, such as would be caused by striking a hidden obstruction under the soil, the auger feed is automatically reversed, thus raising the auger and avoiding injury to the mechanism. An improvement added after considerable experiment is an earth-retain-



AUGER BORING POST HOLE



DROPPING POLE INTO POSITION

ing gate which prevents earth from falling off the auger into the hole while it is being raised.

To further carry out the idea of keeping the manual labor of pole setting down to a minimum, a swinging boom derrick was mounted on the truck body with the hoisting line operated by a small power-driven winch. This power is likewise supplied by the truck engine and is controlled by levers within reach of the driver's seat.

Both the boring device and the derrick equipment have been adapted to this service by J. B. Spowart of the telephone company.

Gaging Trolley Wire for Renewal

The Percentage of Original Area that Can Be Considered Safe for Further Service Can Best Be Determined by Accurate Measurements with Either a Wire Gage or a Micrometer at Frequent Intervals

By G. H. MCKELWAY

Engineer Distribution Brooklyn (N. Y.) Rapid Transit Company

UNTIL recently the time for trolley wire renewal was determined by the number of breaks occurring. Old wire was taken down and new wire run in whenever the number of breaks in any portion appeared to be excessive, and as often no records were kept of the number of breaks that had occurred in any particular section, it was the custom to send a man over the line to count the number of splices between the designated points. Such an inspector would observe, from the street, the apparent diameter of the trolley wire and report places where it seemed to be thin enough to warrant renewal, even if a sufficient number of breaks had not already occurred in it. Other reasons for renewing the wire were obtained from the reports of the crews maintaining it, while occasionally a renewal would be made principally because the superintendent, manager, or engineer believed that the wire had been in the air long enough and must therefore be badly worn.

A plan now largely adopted is to send a man over the line at stated intervals and have him gage the wire at short distances apart, say between each pair of span wires. Such an inspector should be provided with a light tower wagon or truck and a helper to drive it for him. The wire is measured by means of either a wire gage or a micrometer, the latter of which is generally preferred as being the more accurate. Methods for gaging wire vary with different companies. Some measure the wire at the ears, some, on double-track lines, measure at the receiving end and others at the leaving end of the ear, while other companies take measurements at the middle of the section, half way between the ears. Measurements in the center of the section will be the more uniform, but will not show the diameter of the wire where it is thinnest, which is really the information wanted, as the area at the bad spots and not the average area is what should decide as to whether or not the wire should be renewed. On lines where the suspension of the wire is "soft" or springy and where there are no very hard spots, as with catenary construction, especially where the hangers have long loops, and under slack spans on the ordinary trolley construction, there will not be a great deal of difference in the measurements taken at the ears or out in the center of the section. But where the support is rigid, such as is found under tight spans, bracket arms, or, worst of all, trough work, the

difference in dimensions will be very noticeable, and especially so where short heavy ears are used. In such cases it is well not only to make the measurements at the ears but also to take off an ear occasionally and measure the wire directly under it, as it is there that the worst pounding occurs.

Another point on which there is as yet no unanimity

RELATION OF AREA AND DIAMETER FOR WORN TROLLEY WIRE

Area Sq. In.	Diameter	No. 0 Wire	
		Per Cent Diameter	Per Cent Area
0.830	0.325	100	100
0.792	0.309	95	95.5
0.748	0.292	90	90.1
0.682	0.276	85	83.2
0.640	0.260	80	77.2
0.588	0.244	75	70.8
0.538	0.227	70	64.8
0.487	0.211	65	58.7
0.437	0.195	60	52.7
0.385	0.179	55	46.4
Area Sq. In.	Diameter	No. 00 Wire	
		Per Cent Diameter	Per Cent Area
1.046	0.365	100	100
1.013	0.347	95	96.8
0.951	0.329	90	90.9
0.887	0.310	85	84.8
0.824	0.292	80	78.8
0.752	0.274	75	71.9
0.685	0.256	70	65.5
0.625	0.237	65	59.8
0.562	0.219	60	53.7
0.500	0.201	55	47.6
Area Sq. In.	Diameter	No. 000 Wire	
		Per Cent Diameter	Per Cent Area
1.320	0.410	100	100
1.270	0.389	95	96.2
1.195	0.369	90	90.5
1.110	0.348	85	84.1
1.026	0.328	80	77.8
0.945	0.307	75	71.6
0.860	0.287	70	65.1
0.787	0.267	65	59.6
0.704	0.246	60	53.3
0.619	0.226	55	46.9
Area Sq. In.	Diameter	No. 0000 Wire (Grooved)	
		Per Cent Diameter	Per Cent Area
1.662	0.482	100	100
1.571	0.458	95	94.5
1.463	0.434	90	88.0
1.355	0.410	85	81.5
1.238	0.384	80	74.5
1.138	0.362	75	68.5
1.022	0.337	70	61.5
0.904	0.313	65	54.4
0.808	0.289	60	48.6

of opinion is the amount of wear that a wire can undergo and yet be left up with safety. Some companies renew the wire when it has become worn down below a certain percentage of its original diameter, while other companies renew when the wire has been reduced to certain diameters, which may not have any relation to the percentage of the original size, although, of course, percentage and diameter can easily be made to be equivalent to each other. The matter is still further complicated as not only all companies do not agree upon a certain percentage of wear or limiting diameter of wire but the same company often has different diameters or percentages for different sizes of wire or for different lines having the same size of wire but on which there is a difference in the number or size of the cars operated. On an important line the operating department will be much less patient with delays caused by broken trolley wires than on some little-used line, and, because of the greater number of cars on the important line, such delays occur there with much greater frequency.

As a rule the size of the wire will vary with the importance of the line, so that probably the percentage of area, rather than the percentage of diameter, would be the safest way of determining when the wire should be renewed. The percentage of area that it will be found safe to use will not always be the same, but will depend upon the composition of the wire. Hard drawn copper wire is much softer and weaker at its

center than at the outside, and will therefore weaken much more, when the outer skin has been worn off, than will a wire having the copper alloyed with some other metal to increase its strength and toughness. Again, hard drawn copper will become annealed by being heated by the current passing through it, something that will not affect an alloyed wire.

The area of the wire does not vary directly with the diameter, although very often statements will be found where it would appear that some one has based his figures on the length of life of a wire on the decrease per year in its diameter and not its section, and upon the supposition that the diameter will lessen by an equal amount each year until the wire becomes so badly worn as to require renewal. However, the diameter and the area of round, not grooved, wire will remain much more nearly in proportion than would be expected by any one approaching the subject in a purely mathematical manner, because the bottom of the wire will not be worn away to a flat surface as might be supposed, but instead this surface will be curved, being influenced by the shape of the groove of the trolley wheel but not, by any means, conforming to it.

In order to arrive at the true section of trolley wire tests were made by taking sections through a large number of pieces of worn wire, these sections were plotted out to a larger scale and the actual areas found by going over the enlarged drawings with a planimeter. The results as found are given in the accompanying table, and as the writer has never seen similar figures given anywhere they may be of some assistance to others in working out the problem of when to renew wire.

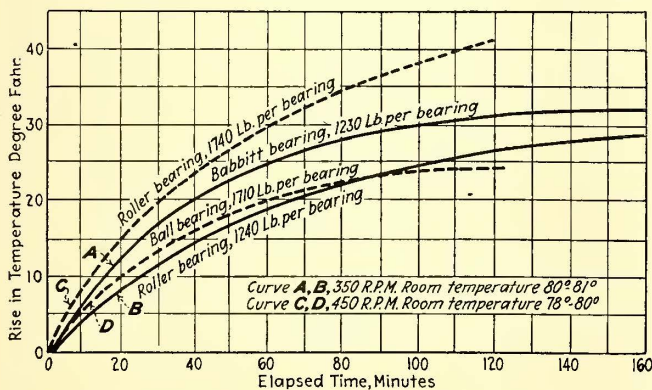
Some Service Results of Ball Bearings

An Outline of Results Which Have Been Obtained With Ball Bearings for Motors of Safety Cars Operated by the Staten Island Midland Railway

BY CHARLES T. PERRY

Electrical Engineer Department of Plant and Structures, City of New York

THE Department of Plant and Structures, city of New York, which operates the Staten Island Midland Railway, has 152 sets of ball bearings on G.E. Type 258 motors operating over exceptionally bad track

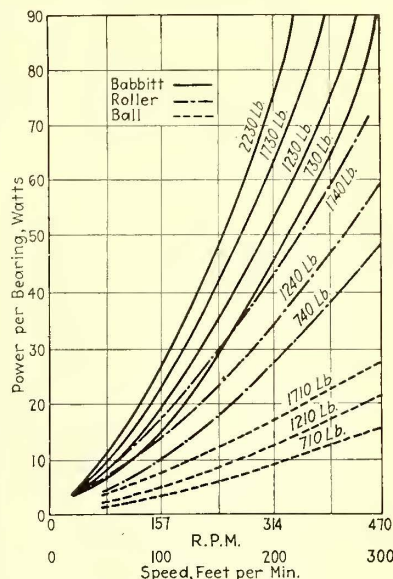


RISE IN TEMPERATURE FOR BABBITT, ROLLER AND BALL BEARINGS

and very severe conditions. This equipment has been in service twenty-four hours per day for the past ten months. During this time there has been but one ball bearing failure. This failure was due to poor lubrication,

caused by a crushed grease pipe connection. Out of 320 sleeve bearings that are operating under the same conditions, there have been no less than fourteen bearing failures; four of these caused extensive damage to armatures and fields.

The lubrication of the sleeve bearings is not only more expensive but also less efficient than that of the ball bearings. The cause of failures in nearly all ball bearings is due to improper lubrication and care; this, of course, is assuming that the original design and construction was what it should be. Lubricants for ball bearings must be selected with care and should be free from any acids which might etch and roughen the surfaces of balls and journals. A good grease forced into the ball casing with a powerful grease gun is the best method of lubrication for railway motor ball bearings.



COMPARISON OF POWER CONSUMED BY FRICTION IN BABBITT, ROLLER AND BALL BEARINGS

The use of ball bearing for motors has many other advantages aside from a reduced lubricating and repair cost. Some of these advantages are: (1) Less power is required on account of the reduced coefficient of friction; (2) the friction of a ball bearing is independent of the viscosity of a lubricant or its temperature; (3) labor necessary to scrape and fit bearings is eliminated; (4) there is less danger of heating and seizing; (5) they are self-adjusting to shaft deflections within reasonable limits; (6) there is a reduction in armature and field repairs; (7) the starting friction of ball bearings is very low, hence there is a gain in power when most needed during the acceleration period; (8) ball bearings are well adapted to both thrust and radial load.

Tests for efficiency which have been made show a saving of from 35 per cent to 70 per cent of the total bearing friction gained by the use of ball bearings instead of the sleeve type. The carrying capacity of a ball bearing is directly proportional to the number of balls in the bearing and to the square of the diameter of the balls.

The balls should be very carefully inspected and selected to be sure that they are true to form and uniform in size in an entire bearing unit. The ball diameter should not vary over 0.0001 in. Balls that are over this limit will not only be overloaded themselves but will also overload and injure the ball races. The material of which they are manufactured should be of the best quality and properly treated so as to have a high elastic limit and so that no scaling or flaking may take place under heavy impact or severe operating conditions.

In connection with the ball bearing problem it is interesting to note certain experiments and exhaustive bearing tests that were recently made at the University of Wisconsin. These tests were made on sleeve, roller and ball bearings. The data accumulated were very practical and definite as the tests extended over a period

of four years, during which time careful comparisons were made and recorded. Tests were made with a speed variation of from 100 r.p.m. to 500 r.p.m. and loads on bearings from 500 lb. to 2,300 lb. per bearing or from 25 lb. to 110 lb. per square inch. During these tests Atlantic Red Engine oil was used on the babbitt, sleeve and roller bearings and Keystone grease No. 2 on the ball bearings. The coefficient for friction-temperature curves was determined by the following formula.

$$f = \frac{(\text{Watts per bearing}) 531}{3.1416 dn (\text{load per bearing})}$$

Where

- f = coefficient
- d = shaft diameter in inches
- n = r.p.m.

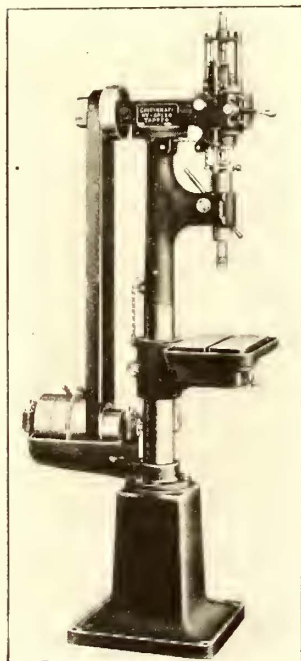
Bearings were loaded to destruction in the final test, the failure points being noted as follows:

- Sleeve bearings failed at load of 4,250 lb.
- Roller bearings failed at load of 5,100 lb.
- Ball bearings failed at load of 4,650 lb.

The accompanying graphs were made from the above test data and are self-explanatory.

Automatic Tapping Machine

THE Cincinnati Hy-Speed Machine Company, Cincinnati, Ohio, has recently placed on the market a line of automatic tapping machines. Among the features claimed for the machines are the patented spindle lead and automatic reversing mechanism by which the tap is brought forward and returned in a positive way entirely free of the operator, tapping holes accurately without danger of stripping threads or breaking taps.



AUTOMATIC TAPPING MACHINE

One-half turn of the stop plunger at the side of the control handle changes the machine from semi to full automatic. When set as semi-automatic, the spindle travels forward, reverses automatically and stops at the end of the return stroke. To start forward again the operator pulls down on the control lever. When set as full automatic, the stop plunger is withdrawn and the spindle automatically reverses at each end of its travel. The spindle can be

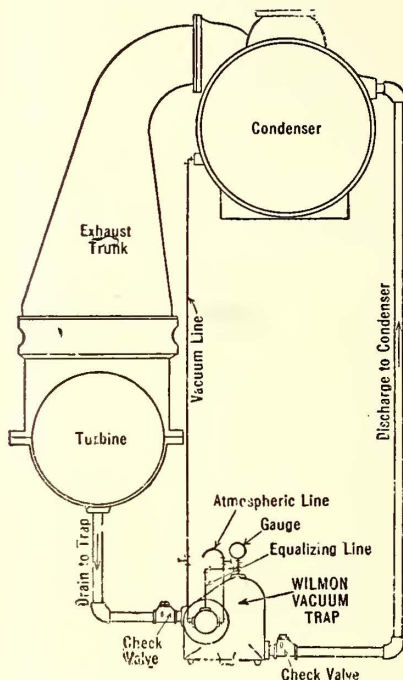
stopped at any point, reversed and again brought forward by use of the control lever.

Adjustable trip dogs with limit stops on the trip rod regulate the depth to be tapped. The chuck is driven by the clutched end on the spindle and locked in position. S.K.F. bearings are used throughout the machine. Machines are regularly furnished for right-hand tapping but attachment is furnished for left-hand tapping, the left-hand device being quickly attached to the end of the rack sleeve. Machines are built with from one to three spindles in two sizes. The maximum capacity is 1/2 and 3/4 in. steel. These machines are built in bench and belted motor-drive types.

New Vacuum Trap

This Type of Trap Is Used in Place of a Float-Controlled Condensate Pump for Systems Using Steam Under Vacuum

THE Wilmon vacuum trap, perfected during the war and applied to marine service, is being introduced by P. H. Gill & Sons Forge & Machine Works, Brooklyn, N. Y., for draining turbines in stationary plants. The receiving chamber of the trap is under vacuum while the water is collecting in the trap and under atmospheric pressure during discharge.



METHOD OF DRAINING TURBINE THROUGH TRAP INTO A CONDENSER ABOVE TURBINE

Back flow is prevented by check valves on the inlet and outlet lines. The change of pressure in the receiving chamber from vacuum to atmospheric and vice versa is accomplished by an oscillating disk covering three ports, which makes a quick shift from one operating position to the other. One of these positions connects the receiving chamber with the vacuum system, and the other connects with the atmospheric line. Communication in both instances is effected through the

equalizing line connecting the middle port to a top opening in the receiving chamber.

The disk and thrust bearing, and the spring which holds these parts in place, are in a separate outer chamber. The disk is operated by a lever float, hammer weight and rocker arm, all on the same shaft and located within the receiving chamber. Water entering the receiving chamber carries the float upward as the level rises, and a contact point on the float stem, between the float and its fulcrum, rotates the weight until, as the latter passes dead center, it drops onto the contact point on the rocker arm and partially rotates the oscillating disk to the opposite position. This shuts off the vacuum line and opens the receiving chamber to atmospheric pressure through the atmospheric and equalizing lines. Water is then forced through the trap outlet, if the latter is connected to a vacuum, or drains by gravity if connected to atmosphere. As the float falls with the water level, the contact point beyond the fulcrum on the float stem lifts the weight past dead center and lets it drop in the opposite direction, when it hits the opposite end of the rocker arm and shifts the disk. This cuts off the atmospheric lines, connects the vacuum and equalizing lines and brings the receiving chamber under vacuum again.

The cycle repeats at a rate determined by the amount of water accumulating. More than three discharges per minute have been obtained with perfect action. The disk requires no adjustment either before trap installation or during service, but may be seen and reached

while the trap is in operation. The trap has a very high capacity, due to the fact that the liquid passes through no restricted passages. It is claimed that a 2-in. trap can handle from 1,800 to 2,100 gal. of water per hour.

A Single-Phase Veteran

Two 2,200-Volt Single-Phase Railways in Operation for the Past Seventeen Years Are Giving Satisfactory Service in Glen Cove and Sea Cliff, Long Island

BY C. R. JONES

Railway Department, Westinghouse Electric & Manufacturing Company, New York, N. Y.

PROBABLY the oldest street traction systems using single-phase power are the Glen Cove and the Nassau County Railways which have been in operation since 1905. These two roads, which are practically one, are owned and operated by the Long Island Railroad and serve the villages of Glen Cove and Sea Cliff on Long Island. They also provide a connecting link

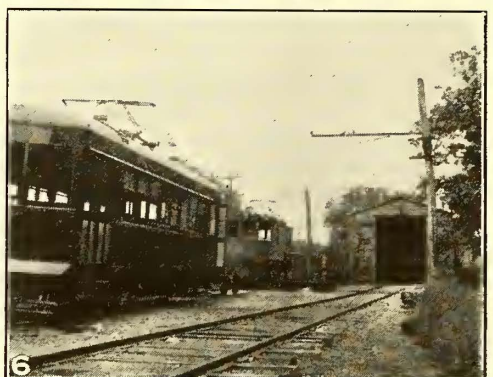
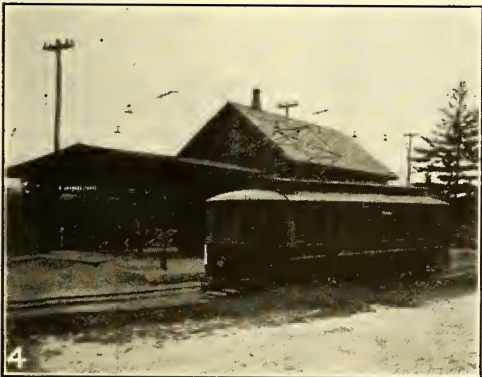
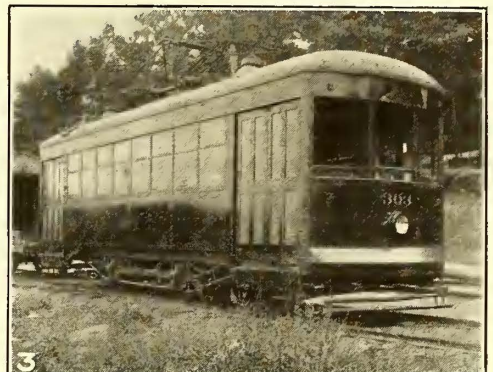
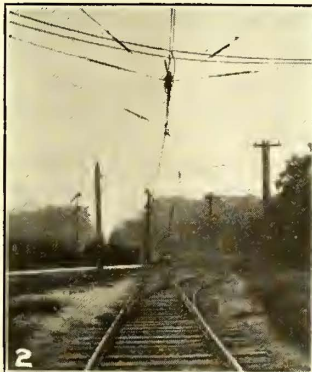
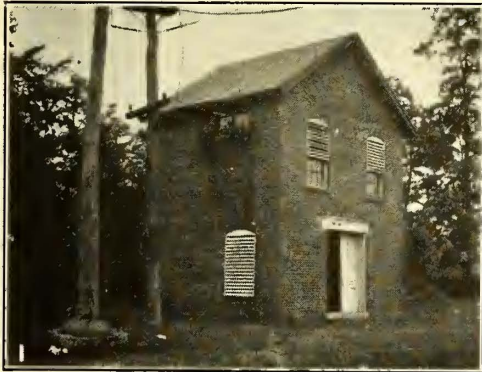
phase motors, and type 451 drum control. A single-phase sweeper is operated when necessary in the winter. The car equipment includes an oil-cooled transformer for stepping down the trolley voltage to 350 volts.

Maintenance on these lines is cared for by a foreman and one mechanic and the cost of this has been reported to be less than for direct-current equipment in equivalent service on other Long Island trolley roads.

The road has suffered from "jitney" and private automobile competition as have other roads throughout the country. The fare now charged is 5 cents on the Nassau County Railway and 7 cents on the Glen Cove Railway, the length of these being 1.8 miles and 3.5 miles respectively.

Small Motor Starter with Safety Features

A NEW type of motor starter, type WK-30, which provides protection to both the operator and the motor, has been developed by the Westinghouse Elec-



No. 1—Transformer station on the Nassau County Railway.
No. 2—Typical overhead construction on oldest single-phase line.
No. 3—Latest type of single-truck car for single-phase service.

No. 4—Closed double-truck car of Glen Cove Railway.
No. 5—Open double-truck car for single-phase operation.
No. 6—Repair shop of oldest single-phase road.

between the stations of the Long Island Railroad and the villages which are on the Sound, as well as between the towns themselves.

Located 30 miles from New York, these lines were far beyond the electrified zone, and the railroad adopted the simple expedient of carrying a single-phase feeder as far as Sea Cliff, where two 200-kw. transformers were installed, stepping down 11,000-volt, 25-cycle current to 2,200 volts, which is fed directly to the trolley at that point, no feeders being necessary. This transformer station is without attendants.

Some of the details of the catenary construction are shown by the accompanying illustrations. Seven cars are operated, of which five are single truck, equipped with two Westinghouse No. 108 single-phase railway motors and type 224 drum control. Two are double truck, equipped with three Westinghouse No. 108 single-

phase motors by connecting them directly to the line.

This starter consists essentially of an inclosed quick-make-and-break knife switch, operated by an exterior handle. It protects the motor from overloads both when starting and when running because it is equipped with thermal cut-outs which open the circuit on dangerous sustained overloads but do not operate under momentary overloads. The cut-outs resemble cartridge fuses but are not interchangeable with fuses so that the latter cannot be substituted for them. They operate by fusing a special washer, which can be replaced in a few seconds time at negligible costs. All parts are inclosed so that the operator cannot touch live contacts.

These starters are made in sizes for alternating-current motors up to 3 hp., 110 volts; 10 hp., 250 volts, and 10 hp., 600 volts.

Rough Machining Cause of Axle Failures

Corrugations in Steel Make It Fail When Subjected to Service Jars—Remedy for This Is to Grind Steel Parts to a Smooth Finish

THE many failures of railway car axles cannot be accounted for only by overloads or jars, since the designers of the axles use sufficient factors of safety to care for these conditions, nor can failures be attributed to faulty materials. Arthur Norton in an article in the *Electric Railway and Tramway Journal* attributes many of these failures to the secondary effect of cracks caused by rough machining. All axles are turned, but they then should be smoothly ground over the whole portion. A rough turned axle is really a kind of threaded bolt, the length and thickness of the thread being dependent on the cut and feed used in the lathe operation. The lathe tool also does not cut in the sense that a razor cuts, but the turning consists of small pieces sheared one up against the other. The surface of the turned axle then is simply a sheared surface from which small particles of steel have been torn away.

Along the axle after turning there occur periodically small cracks or gaps lying at right angles to the direction in which the work has moved when tooled (in lathes) or the tool has moved over the work (in shapers). These small gaps are caused by the edges of the tool pushing the layer of steel before it until such time as the steel can move no further without breaking. When the steel, distorted by the moving tool, breaks, one of the small gaps is formed and this accounts for the gaps being periodic; the size and spacing depending on the cut and the feed. On a turned axle these gaps lie along the axle and in general across the direction in which the axle will be bent in service and cannot therefore do much harm unless they lie in such a position as to facilitate fractures under working stresses. The grooves lie in the direct line in which fracture is most likely to occur under working stresses.

These gaps and grooves in steel facilitate fractures very greatly and also, as on an axle where the load is supplied at periodic times, these rough machine marks, being closely adjacent to each other, affect one another and the consequent failure of an axle under a comparatively small stress may be accounted for by such a surface condition. It would appear from this analysis that railway car axles, having smoothly ground surfaces and free from sharp angles and accidental notches or dents, might be durable even when the steel used and its condition were nothing exceptional. But in addition to having a smooth outer surface the axle should also be subjected to other tests which will insure against accidents. A steel that would resist fracture in spite of a grooved and distorted surface would be advantageous and an important object in selecting material is to minimize the evil effect of grooves and notches by subjecting a notched bar of the material to some sort of test. An easily made test and one that is very efficient is to take a small piece of the actual material, notch it, place it in a vise and then bend it by means of a hammer. Those materials that are brittle break off short soon after the load is great enough to deform them, others that are tough flow under the load.

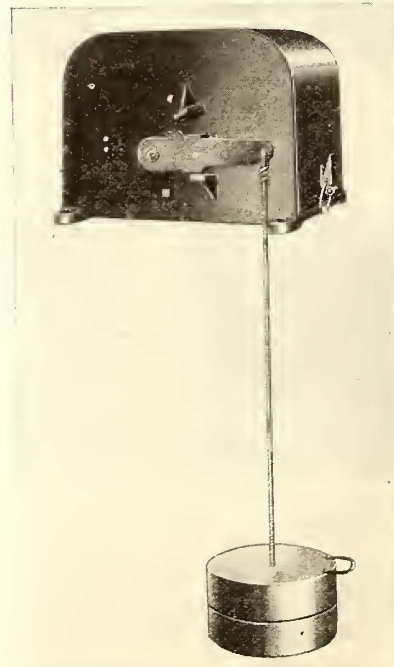
The objection to this notched bar test alone is the fact that ordinary carbon steels would be ruled out as they have a very low notch bar test value. Alloy steels, on the other hand, can be depended on to give high

notch bar test values. Nickel steels, chromium steels or nickel chromium steels are suitable for railway axles because of their increased test value, but either nickel or chromium or both when added to steel increase its hardness, particularly after oil quenching, and this steel gives axles that are harder than needed in the service. Ordinary carbon axle steel, as forged or normalized, has a tensile strength of about 36 tons and a notched bar test value of 25 ft. lb.; 3 per cent nickel steel, as forged or normalized, has a tensile strength of 47 tons and a notched bar test value of 35 ft. lb. If, however, the nickel steel is hardened and tempered the tensile strength is about 50 tons and the notched bar test value rises to 60 or 80 ft. lb.

The conclusions suggest that the physical properties of greatest value in axle steel are its tensile strength and its notched bar value and the heat treatment processes which confer these properties are those which confer also high elastic limits, yield points and fatigue ranges. If such steels are machined to minimize sharp angles or rough, distorted surfaces, service reliability can be assured to the greatest extent.

New Crane Limit Switch

A NEW crane safety limit switch, type LC, has been put on the market by the Westinghouse Electric & Manufacturing Company. This switch is designed to eliminate the undesirable features connected with the operation of a crane or hoist installation, when the



LIMIT SWITCH HELD IN OPERATING POSITION BY MEANS OF COUNTERWEIGHT

hoist brake overtravels. The normal operating range of the hoist is increased by the use of this switch as it permits the handling of a greater amount of material, since there is no necessity of losing time by approaching the limit of travel slowly and cautiously. The safety limit guards the equipment irrespective of the kind of control or the position of the controller handle or brakes.

Under normal operating conditions the limit switch is held in the operating position by the counterweight, as shown, which overpowers the torsion operating springs. In case of overtravel, the counterweight is raised by the hoisting hook or other moving part, which permits a strong torsion spring to operate the switch. This disconnects the motor from the line and establishes a closed dynamic braking circuit. The operation of the switch also releases the series magnetic brake which holds the load until the controller handle is moved to the lowering position. As soon as the hook has been lowered beyond the limit, the switch is again ready to function as before, as it resets itself automatically.

New Light on Quenching Cracks

QUENCHING cracks are very prolific sources of trouble to tool hardeners, especially if the tools are made from high carbon steel. Usually these cracks have been thought to be due to high quenching temperature and non-uniform distribution of the temperature in the part. An investigation at the Imperial University of Japan by Honda brings out some other causes which tend to form quenching cracks.

In all quenched steels a certain amount of austenite is generally present mingled with some martensite, the amount increasing as the quenching temperature increases, and in small pieces of steel the periphery is harder than the central portion only when the quenching is very slow. In a moderate quenching the hardness is everywhere about equal and in hard quenching the periphery is always softer than the interior. This phenomenon is explained by the presence of the arrested austenite in martensite.

The quenching cracks in small pieces of steel occur when the hardness of the central portion is greater than in the periphery, and the cause is attributed to the stress caused by the difference in the specific volume of austenite and martensite, that of the former being much smaller than that of the latter, so that the central portion exerts a tangential tension on the periphery causing cracking of the specimen. Since the difference in specific volume increases as the temperature decreases, the cracking usually takes place at room temperature. In hard quenching the hardness increases with lapsed time, owing to the gradual transformation of the arrested austenite into martensite. In the case of a very large piece of material, the cracking may take place in an upper range and also in the vicinity of room

Some of the samples will be uncovered and examined from time to time to determine the rate of corrosion.

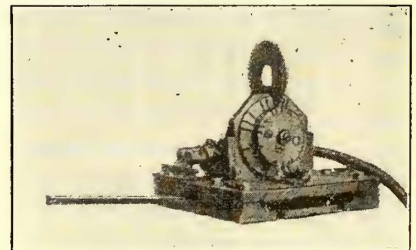
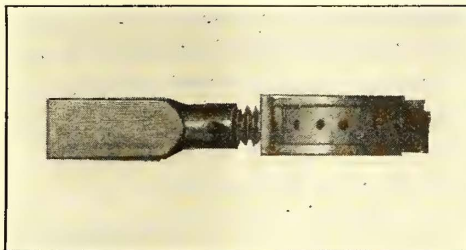
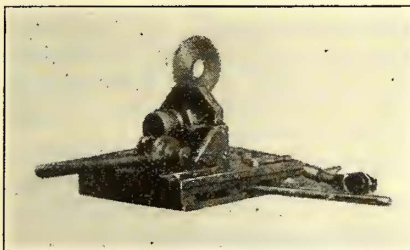
Complete data on the physical and chemical properties of the soil will be obtained and the chemical analyses of the pipe, their microstructure and complete metallurgical history will be determined. Extensive laboratory experiments will be conducted to determine the effects of variations in individual characteristics of both soils and pipe materials. Some tests of representative pipe coatings will also be undertaken.

It is expected that a great many data as to the relative rates of corrosion of different kinds of pipes in the soils under observation will be obtained within two or three years, but the experiment will probably continue over a period of eight or ten years. Progress reports will be published from time to time as developments warrant.

Reclaiming Controller Segments

Cutting of Segments to Proper Length Facilitated by Use of a Cutting-Off Attachment to a Circular Saw Carriage and a Machine for Punching the Segments

THE Portland Railway, Light & Power Company has reduced the price of making controller segments from an average of 4 cents each to 1.8 cents by the use of two shop constructed machines. The first of these is a cutting-off machine which forms a part of the carriage for a circular saw and the second is a machine for punching the segments which is made to attach to a small power punch. The cutting-off machine has a revolving head and clamp and is laid off with slots for the various lengths of segments used. The segment to be cut is held in the revolving head by a clamp pro-



AT LEFT AND RIGHT, CUTTING-OFF MACHINE FOR RECLAIMING CONTROLLER SEGMENTS. IN CENTER, ATTACHMENT FOR PUNCHING SEGMENTS

temperature. The cracking at the high temperature is caused by the stress in the structural difference between the inner and outer portions—pearlite and austenite—just below the high temperature critical point, while that at room temperature is due to similar stress occurring, as previously outlined, because of the difference in specific volumes of austenite and martensite.

Tests on Soil Corrosion

THE Bureau of Standards has recently undertaken an extensive investigation of the corrosive action of soil on pipes used for gas and water mains and services. In this investigation the Bureau of Standards has the co-operation of the Bureau of Soils of the Department of Agriculture, the pipe manufacturers and the public utilities through the research sub-committee of the American Committee on Electrolysis. Forty locations have been selected as representative of the principal families of soils to be found throughout the United States, and in them will be buried a number of samples of every kind of iron and steel pipe in commercial use.

vided with pressure from a spring. The other essential parts of the machine consist of a small air cylinder which is attached to the back of the head and a controlling valve on the carriage which has an eccentric on the stem so as to control the air admitted to and released from the cylinder as the carriage is moved.

In the cutting operation the carriage is thrown all the way back by the lever on the side. This opens the control valve and allows air to enter the back of the cylinder, thus opening the clamp. The segments are then put in position, and as the head is marked for the various lengths of segment used it is readily seen just how they can be cut to the best advantage. The carriage is then moved forward and this automatically lets the air out of the back of the cylinder and the spring clamps the segment so as to hold it in position in the head. This allows the head to be swung around to the position necessary for cutting off the segments. A small latch at the bottom holds the head in place, and as the head is moved forward the air valve opens, which allows air to enter the back of the cylinder, thus clamping the

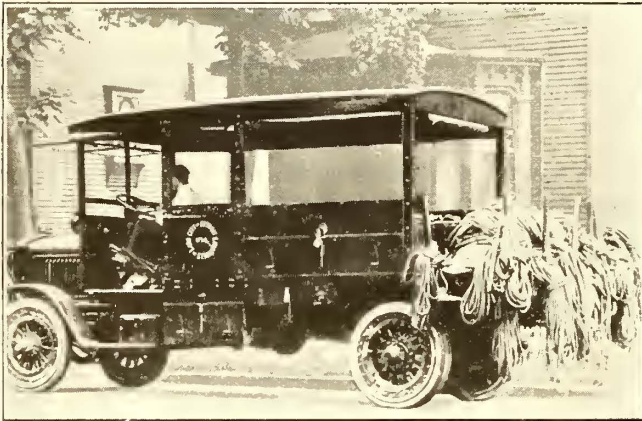
head tight to the frame before the saw strikes the segment.

For the remainder of the cutting operation the carriage is moved but a part of the way back, which releases the head only, so that it can be turned to make the rest of the cut. All the cuts necessary are made before taking the segment out of the machine, and the carriage is then moved all the way back, which releases the segments.

Another illustration shows a machine which was constructed for punching the segments. This was made for attachment to a small power punch. The circle guide has pin holes for stops of the various segments. The spring keeps the operator from getting his fingers under the punch.

New Winch Truck for Detroit

THE accompanying illustration shows a new 4-ton truck purchased by the Department of Street Railways for the city of Detroit. The cab construction is similar to that used by the Public Lighting



NEW WINCH TRUCK FOR DETROIT

Commission and is equipped with a Bay City type C winch. Weatherproof curtains are provided on the sides and rear, arranged so that they can be rolled up and held by straps when not in use. The truck has a full equipment of tool boxes, etc. Other equipment provided includes an odometer, generator, storage battery, electric tail lamp, two electric headlights, mechanical horn, radiator guard, trailer attachment, tow hooks and skid chain hooks.

Properties of Molybdenum Steel

THE scope and application of molybdenum steel appear to be wider than that of other types of alloy steel. The early uses of this steel were for tool and magnet steel. At that time the ores of molybdenum were considered to be much scarcer than now.

It has been found that the chief value of the element is its indirect or intensifying effect in the more complex steels. Its action in fractional percentages intensifies the excellent qualities of other important alloy steels, supplying in these certain qualities without which they are limited in their application. Special steels in which chromium, nickel and vanadium play an important part are handicapped by the narrow limits of temperature within which heat treatment is effective. Outside of this small range their high-grade qualities are seriously impaired. For these shortcomings molybdenum acts as a corrective and greatly extends the range within

which heat treatment is beneficial. It considerably increases the tensile strength of carbon and nickel steel. In chromium-nickel steel, probably through the formation of double carbide, additional tensile strength, hardness and other beneficial qualities are imparted.

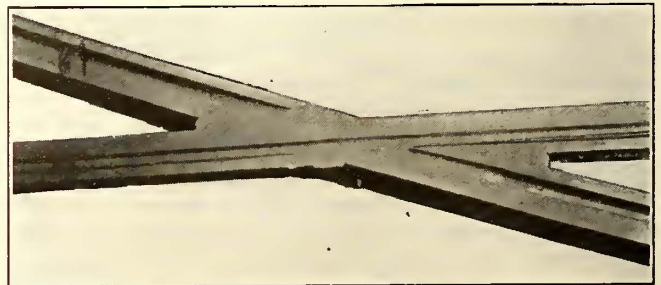
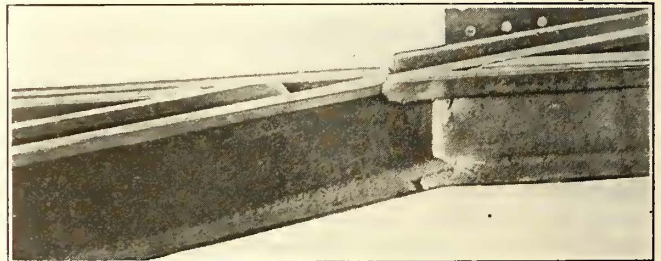
Twenty-five thousand tons of this class of steel have been produced by one company in the United States since 1918 and no serious difficulties have been encountered in any stage of manufacture or in melting, casting, rolling or cold drawing operations.

The outstanding features relative to the heat treatment of molybdenum steel are the extremely wide quenching temperatures available for practical heat treatment, the excellent penetrative effect of such treatment on large sizes, and the broad drawing range causing but slight modifications of physical properties. It is claimed that molybdenum steel can be machined more easily than other alloy steels, of equal physical properties.

Constructing Acute Angle Frogs by Welding

THE accompanying illustrations show a frog constructed by means of Thermit welding, which is of more than ordinary interest because of its unusual acute angle, about 18 deg. This angle required an exceptionally long weld, using approximately 200 lb. of Thermit or around three times as much metal for the weld as for a square frog of the same rail section. In making this frog, two arms of a curved 9-in. guard rail were welded to another straight 9-in. guard rail. As shown in the illustration of the completed job, the frog was an unbroken main-line frog, and there was to be no flangeway cut through the surface of the straight main-line rail.

In aligning the component pieces of rail, it was necessary to provide for three different radii on the curved rail, one of which extended from the end of the shorter arm to about 5 in. or 6 in. beyond the other side of the frog. An extra long motor box was necessary. The



UPPER VIEW SHOWS ACUTE ANGLE FROG WITH RAIL ARMS LINED UP IN POSITION PREPARATORY TO WELDING. LOWER VIEW SHOWS TOP OF COMPLETED FROG

weld was poured at the acute angle apex, a separate crucible being used at each end. When the job was installed in the street (of a large Eastern city), the frog slipped into perfect alignment with the other rails.

Self-Corrosion of Cast Iron and Other Metals in Alkaline Soils*

The Authors Give Interesting Results of Extensive Experiments Made With a View to Obtaining More Definite Information on the Cause of the Destruction of Cast Iron Water Mains in Towns of the Prairie Provinces

By W. NELSON SMITH† and DR. J. W. SHIPLEY‡

THIS information is the result of our investigation undertaken in the interest of a large public utility to derive proof that a great deal of the destruction of city water mains by external corrosion could not be due to electrolysis from stray electric railway currents in the earth. In order to corrode a pipe a stray current must be flowing out of it into the surrounding earth, and that can only happen adjacent to a power station or in close proximity to some other path of lower resistance, such as a railway track or an underground cable, which may be connected to the power station. A large proportion of the corroded water pipes were either remote from railway tracks or in localities where current would be flowing into them and not out of them, and it was believed that some cause other than stray current was operating in such localities.

Cast iron pipe has been generally thought to be immune from corrosion except in strongly acid soils, but our field observations and chemical researches have convinced us that the self-corrosion of cast iron pipe in the moist clay and lime silt non-acid soils of the Red River valley is an indisputable fact and is bound to happen anyway, whether stray current is absent or present.

ELECTROCHEMICAL PRINCIPLES

Every metal in contact with water tends to dissolve in the water, independently of any emf. impressed from outside. This tendency to go into solution is termed solution pressure. Such metals as sodium, potassium and magnesium, the alkaline metals, very readily go into solution and are conceived to have a high solution pressure, while gold, mercury and platinum are metals with very low solution pressures. These solution pressures in fact correspond to the positions of the various metals in the so-called electrochemical series of elements, tabulated in the text books.

Iron occupies an intermediate position in the electrochemical series, but is considerably above hydrogen, which is considered as a metal in the series on account of its electrochemical behavior. Iron has a higher solution pressure than hydrogen and can, therefore, displace it. Consequently the iron ions entering a solution are able to drive out of solution any metallic ions occurring below it in the electrochemical series or any hydrogen ions. A perfectly dry surface of iron will not corrode even when exposed to air or pure oxygen. It will only corrode if moisture be present where there is a hydrogen ion to be displaced. Rusting should

therefore be conceived, fundamentally, not as an attack of oxygen, but as a retreat of hydrogen.

According to the electrochemical conception, when an atom of metal passes into solution it assumes a positive charge of electricity and leaves the metallic mass from which it is separated negatively charged. Metallic ions and hydrogen are therefore conceived of as having positive charges and traveling in the same direction as the electric current. The OH ions and the acid radical ions have negative charges and travel against the current. This is true whether the act of going into solution generates the electric current as in a primary battery or whether the liquid solution is decomposed and its elements driven out of solution by an impressed electric current. The electrochemical mechanism is, therefore, somewhat analogous to the reversible property of an electric current on a wire in a magnetic field, in which the current produces motion, or the motion can produce current.

THE SOILS OF THE WINNIPEG DISTRICT

The soils of the Winnipeg district are lacustrine and alluvial silt and clay overlying glacial till. They are very rich in lime and are the result of glacial pulverizing action, which was very efficient, causing the soil particles to be very finely divided. This fine division exposes the maximum of surface to the solvent action of the ground waters, and consequently the soluble and commonly called "alkaline salts" present in the original limestone have been leached out and concentrated in local areas, giving rise to the alkaline nature of our surface soils. The redistribution of these soluble salts is little understood, but the prairie areas adjacent to Winnipeg have a very high concentration of these salts in the surface layers of the soil, so great, in fact, that they everywhere approximate the toxicity limit for plant growth. In the presence of water, the soils are of very low electrical resistance.

The salt content of the ground waters is very largely sulphates and chlorides of calcium and magnesium, the sulphates predominating. Aggregations of crystals of calcium sulphate and magnesium sulphate frequently occur in a layer about 4 ft. beneath the surface. This layer is several inches thick and is highly calcareous. It has been observed at many widely separated excavations where water mains had failed and studied in detail at the large excavation made for Eton's recently built warehouse on Donald Street. When this layer is dug through in placing a pipe line the earth used in back-filling the trench naturally contains these salts and they come in contact with the pipe, creating the possibility for galvanic action. These salts are even more frequently met with at lower levels, 10 ft. or 12 ft. below the surface, in the clays immediately under the pulverized limestone layers. They have crystallized out along the bedding planes and in the irregular

vertical breaks in the horizontal layers of clay. Very frequently they occupy, as aggregations of crystals, the spaces at one time filled by the roots of a tree.

The significance of these saline deposits lies in their location respecting the water mains. In the Winnipeg region they occur at levels of from 4 ft. to 12 ft. below the surface and have been frequently observed in contact or within a few inches of the pipe as it lay in place, where the water mains had failed from corrosion.

These deposits of salts form the reservoir from which the ground waters receive their saline load. The more soluble chlorides have not been found in crystal aggregates, nor are the chlorides so widely distributed as the sulphates.

PRELIMINARY EXAMINATIONS OF SOILS

One of the first things done was to examine about eighteen samples of soil from various parts of the city, mostly from excavations around water pipes. Some were taken from the middle of the business district and some on the outskirts of the city. Of the eighteen samples nine were from places where pipes had been corroded to destruction, and of these nine two were from areas where pipes were thought to have been generally electrically positive to the earth, three from where they must always have been negative to the earth and four from areas where the polarity was as likely to have been negative as positive. Of the remaining nine samples seven were from places where pipes had been visibly corroded but not seriously, two from positive and five from negative areas or regions outside the electric railway zone, while two more were taken from excavations where pipes had never been laid. Some were from positive and some from negative areas.

These first proximate analyses were made by leaching a little of the soil sample with distilled water, filtering and testing the clear filtrate for the dissolved chlorides and sulphates. The sulphate radical was found in every single sample, indicating its universal distribution throughout the soil of the city.

It is very significant, indeed, that wherever a cast iron pipe had been corroded to destruction, whether near an electric railway power station or a mile or two distant from it, the soluble sulphates of both calcium and magnesium were invariably found in the soil close to the pipe.

Sometimes these salts were so observed in crystal form, actually in contact with the pipe. The presence of salt crystals in contact with the pipe can only mean that the ground water in contact with the pipe was actually a concentrated salt solution.

The experiments made afford sufficient proof that the soils in the city of Winnipeg will corrode cast iron pipe on their own account, if given water enough and time enough.

From the foregoing experimental study the following conclusions were drawn:

1. The corrosion of cast iron by soil salts individually and collectively is readily accomplished under natural conditions without access of stray current and is of the graphitic pitting nature by which is meant the commonly observed condition of the material remaining in place, which is invariably of a soft spongy texture, with part of

*Abstract of a paper presented at the Western professional meeting of the Engineering Institute of Canada, Saskatoon, Aug. 10, 1921. A full report of this paper was published in the *Western Canadian Contractor and Builder* for October, 1921.

†Consulting electrical engineer Winnipeg Electric Railway.

‡Assistant professor of chemistry, University of Manitoba.

the iron dissolved out, the remainder resembling graphite in texture and softness, hence the term "graphitic."

2. Magnesium salts are the most corrosive of the soil salts, and magnesium sulphate, which was found wherever a cast iron pipe had been destroyed, is apparently the most effective of the salts experimented with.

3. Local action induced by naturally occurring concentration cells may easily be a factor in the pitting of cast iron exposed to salts of varying concentration.

4. Slight pitting corrosion was found in pieces of cast iron exposed to the action of small samples of wet soil and intermittently heated, even in the short period of forty days, and with only a limited supply of water as compared with conditions in the ground, without any impressed emf. being present.

PHOSPHATE AND SULPHIDE IN CORROSION PRODUCTS

Although it seems a comparatively simple matter to account for the fundamental chemical reactions that result in the formation first of the ferrous and then of the ferric hydroxides, we have found other corrosion products of such a strange character as to make it evident that the corrosion process in the soils considered may be quite complex.

In some of the graphitic spongy residue in the pits of corroded pipes we have found ferrous phosphate incorporated with the other material, being noticeable by reason of its light bluish green color. Sometimes small lumps of it could be lifted out of the pipe pits as a filling can be lifted out of the cavity of a tooth. A partial analysis of one sample showed 18 per cent of ferrous phosphate, 20 per cent of metallic iron and 42 per cent of carbon and silica. Evidently it did not occur in the original iron, but was formed in the corrosion products along with the hydroxides. It has sometimes been reported as a deposit in buried bones, but not as a product of stray current electrolysis. Why ferrous phosphate should occur in a corroded cast iron water main is a riddle that has yet to be solved.

Along with other corrosion products, iron sulphide was found to be nearly always present both in the pit and in the scale, from pipes not only within the city but several miles outside the electric railway area. A number of experiments were made with cast iron and soil samples in glass bottles to try to determine whether the sulphide was the result of self-corrosion or of stray current corrosion. Sulphide was found to be present in both cases, showing that it is not peculiarly a product of stray current electrolysis. The sulphur required for its formation seems to come chiefly from the free sulphur mixed in with the original cast iron, but it is also possible that the electrochemical reactions cause the reduction of the sulphates in the soil to sulphides. If it is an electrochemical process it can happen as easily with galvanic as with stray currents. Sulphides are found in pipe pits and scale on the inside of water pipes as well as outside. We have found sulphides in chips of wood and clay taken from the butts of electric light poles recently taken out of the ground, and it is suspected that the presence of sulphur forming bacteria may have something

to do with the formation of sulphides, wherever found. We are not aware that either the phosphate or the sulphide of iron have been previously reported by other investigators of the corrosion of cast iron pipe.

THE MOISTURE CONTENT AND THE ELECTRICAL RESISTANCE OF SOIL

The moisture content of the samples of soil collected in this investigation varied considerably. The electrical conductivity of the soils is a function of the moisture content as well as of the salt content, and it was deemed desirable to measure the electrical resistance and determine the moisture content of about fifty samples taken from various places.

Eighteen of the samples were taken directly from off water pipes and the average moisture content was 28.75 per cent, the range being from about 20 per cent to 35 per cent. The resistance of these same eighteen samples averaged 570 ohms per cu.cm., which is a very low average rating of soil resistance. One was as low as 206 ohms, while another was 1,085 ohms, the difference in these two instances being probably due more to difference in the salt content than the moisture content of the samples.

The moisture content varies indifferently with depth. Sometimes the dried soil is above, sometimes below, and there is no way of foretelling what the order will be at any one spot. The character of the soil varies at different levels and the capacity for holding moisture varies with the character of the soil. Clay soils are well known to be most tenacious of water.

One sample of soil was taken from around a gas pipe in a limy silt soil at Edmonton and St. Mary's Street, Winnipeg. This pipe was about 4 ft. down. The moisture content was only 4.5 per cent and the resistance was 1,965 ohms per cu.cm., or about three and one-half times the average resistance of the eighteen samples taken from the water pipes. This fact is of particular interest also, because the soil around this gas pipe was comparatively dry, while in samples taken 2 or 3 ft. directly above and below, the moisture content was three or four times as great and the electrical resistance less than one-half that of the soil directly around the pipe.

SOIL ACTION ON LEAD AND COPPER

Lead and copper are also affected by self-corrosion in these same soils, but our researches have not continued long enough to submit much information. A lead water service pipe in the Selkirk Mental Hospital grounds was found to be corroded and the evidence of decayed manure in the original back-filling of the pipe trench led us to suspect that nitrates may have hastened corrosion, the other soil salts being much the same as in the case of the corroded cast iron pipe.

To briefly review one experiment, a small new lead plate was buried in contact with a clay soil and some black surface soil in a sealed glass container, with plenty of moisture present, and when removed at the end of four and one-half months was found to be pitted with little cavities about as big as pin heads, which were filled with white pellets of crystallized lead sulphate. No heat was applied during the experiment.

A copper ground plate buried below the basement floor of the Manitoba Government Telephone Exchange in St. Boniface corroded in eighteen months or less after installation. We were given to understand by the telephone people that it would not be possible for any stray current to be leaking out into the earth from the telephone system through this ground plate. We subsequently immersed some thin sheets of copper in neutral solutions of the alkaline salts above mentioned and observed evidence of chemical attack within twenty-four hours, by the formation in the solution of insoluble greenish compounds of copper.

Workmen's Compensation

Procedure Adopted in New York on July 1 Is Described by the Director of the Bureau

IN AN address delivered before the annual meeting of the International Association of Industrial Accident Boards and Commissions at Chicago, Sept. 19-23, Stanley L. Otis, director of the Bureau of Workmen's Compensation, New York State Department of Labor, described the present procedure of the bureau. This method was adopted on July 1 of this year. The work of the bureau is divided into five districts, the offices being located in New York, Albany, Syracuse, Rochester and Buffalo. The claim procedure, which is practically the same in each district, is as follows:

The injured employee is required to file with the industrial commissioner an employee's first report of injury, and employers are required to keep copies of these reports on hand for the use of their employees. Employers must file promptly and within ten days an employer's first report of injury covering all accidents causing loss of time or necessitating medical attention with the industrial commissioner and, if filed through the insurance carrier, the original is to be forwarded to the bureau. Immediately upon the filing of the employer's first report the injured employee is sent a copy of form C-3, which is the employee's claim for compensation, together with instructions for the preservation of his rights. An employer's supplementary report of injury is to be filed before or not later than fourteen days if the employer's first report does not show the time the injured employee returned to work. Where the disability resulting from an accident terminates and the injured workman returns to work and subsequently is disabled as the result of the original injury an employer's supplementary report of subsequent disability is to be filed.

The first payment of compensation becomes due on the twenty-first day of disability, and on that date or within four days thereafter the compensation due is to be paid. This payment acts as a waiver of the reporting of the accident by the employee and his filing of a claim for compensation. When the employer or insurance carrier suspends the payment of compensation notice must be sent in duplicate to the industrial commissioner. If the employer or insurance carrier intends to controvert the right to compensation he shall either on or before the twenty-fifth day of disability file a notice in duplicate with the industrial commissioner that

compensation is not being paid and indicating in such notice the reason for such non-payment.

After the claims have been prepared by the claims division and its examiners the notices of hearings are sent to all interested parties. The notice states that "if no objection is made either in writing or by person on or before the date mentioned claim will be closed," and this action is taken without prejudice if the claimant does not appear on the day of the hearing or if he has not written the bureau in the meantime. In case there is some question in dis-

pute it is expected that the claimant and the employer will be present, together with the examiner, so that the differences can be adjusted and the case closed.

As the new system only went into effect on July 1 it is too early to have figures at all reliable as to results. However, it is expected that at least 70 per cent of the cases can be closed without a hearing and that the differences arising in 20 per cent of the cases can be satisfactorily adjusted, leaving only 10 per cent of the cases to revert to the referee's testimony calendar.

American Committee on Electrolysis Reports

Complete Compendium of Present-Day Knowledge and Best Practice Is Principal Characteristic of 1921 Report of This Committee

THE American Committee on Electrolysis has just issued its 1921 report, superseding its preliminary report of 1916, in book form. It is primarily a marshaling of the general and specific knowledge regarding the causes of electrolysis and methods of electrolysis mitigation, and in no way attempts to lay down specific recommendations as to best methods of preventing or mitigating electrolysis troubles.

The following statement, taken from the preface of the report, is important as indicating the opinion of the committee regarding its report: "A report is herewith submitted which embodies such statements of facts and descriptions and discussions of methods of electrolysis testing and of electrolysis mitigation as the members of the committee have unanimously agreed upon.

"While this report supersedes the preliminary report of 1916, it should be considered as in the nature of a progress report and not as final, as it is impossible at the present time to finally answer many of the outstanding questions involved. Also, it is to be understood that the report is confined to the technical and engineering aspects of the subject and does not attempt to deal with matters of policy or with legal questions, such as the rights and responsibilities of the several interests concerned.

"At times great differences of opinion between members of the committee have arisen, but the subject differed upon has been patiently discussed at sub-committee meetings, and in some cases tests have been made and a final discussion held on the subject by the main committee until unanimity of opinion existed. The results as thus determined are herein recorded."

From one angle, the book or report might be regarded as a complete text of electrolysis and in a way is so presented, and arranged. A good ground work of principles and definitions of terms is placed at the beginning of the report.

More than one-third of the 204 pages of the book are devoted to discussion of the design, construction, operation and maintenance of railways and of underground structures affected by electrolysis and to a discussion of measures involving the interconnection of affected structures and railways, ending with a summary of good practice as analyzed by the committee. Early in this chapter, the committee states: "The practical electrolysis problem is due to stray current from electric railways. Instances of stray direct current from

other sources sometimes occur, but such cases are not specifically considered in this report."

The committee makes this recommendation:

"Prior to the consideration of measures of electrolysis mitigation, the following features should be given due attention:

1. Measures tending both to railway economy and the reduction of stray current.

(a) The return system, including track bonding, should be put in proper condition.

(b) The number of substations should be made a maximum consistent with railway economy.

2. Measures employed solely for electrolysis prevention. Where necessary to effect a still further reduction in electrolysis below that provided by the most economic railway system, one or more of the following measures should be taken:

(a) Applicable to railways. (1) Additional substations. (2) Insulated feeders. (3) A modified system of power distribution, such as a three-wire system.

(b) Applicable to affected structures. (1) Insulating joints in pipes and cables. (2) Insulated coverings for pipes.

(c) Interconnection of affected structures and railway return circuits. (1) Electrical drainage of cable sheaths. (2) Electrical drainage of pipes."

In the summary of good practice, some comment favorable or unfavorable is based upon most of the methods of electrolysis mitigation which have been attempted. It is interesting, in this connection, to remember that this report is one which represents a unanimity of opinion.

The other chapter headings in the book are: "Electrolysis Surveys," "European Practice," and "Electrolysis Research."

Under the first of these headings, there is an excellent portrayal of the whole question of electrolysis surveys, their purpose, scope, possibilities, interpretation, as well as the instruments available for making them.

EUROPEAN PRACTICE REVIEWED

The practice among the European countries which have made any study of electrolysis is analyzed and summarized thus:

"In Europe, the effectiveness of the co-operative or regulatory measures applied to the electrolysis problem may be summarized as follows:

"Germany, through voluntary co-operation, has probably remedied the former dangerous electrolysis conditions for all of its important systems. The instrumentality of agreements on definite technical standards was sought in preference to legislation.

"France has not been as successful in bringing prompt results through legislation as has Germany through technical co-operation.

"England, which has had government regulation for many years, has now no electrolysis troubles or disputes.

"Italy will probably give more consideration to the subject of electrolysis whenever the general conditions will permit.

"The methods followed to attain the satisfactory results obtained abroad are these:

1. Maintenance of good bonding.
2. Elimination of intentional contacts and liberal separation wherever possible, of pipes and rails.

3. Avoidance of bare copper returns and use of insulated returns in all installations where the conductivity of the rail alone would give a too great maximum drop.

4. Use of insulated return feeders with balancing resistances, or to a lesser extent "boosters" for the purpose of maintaining equality of rail potential at the feeding point of all feeders.

5. Small feeder drops and frequent substations to give close line regulation."

As to research, the committee's principal point is that there must be a development of practical means for measuring current density across contact surfaces of pipes and earth, and for the determination of polarity of structures and adjacent earth. (In ELECTRIC RAILWAY JOURNAL, Nov. 5, p. 809, Burton McCollum, a member of the committee, outlined a new method of earth current measurement and described a new instrument which will probably form the basis for much of the research work on electrolysis in the future.) The committee also outlined certain researches which should be carried out in order to make it possible to reach more nearly definite conclusions with reference to the best practice to follow, under various conditions, in electrolysis mitigation work.

The committee making this report is a joint committee of nine organizations, each organization having three members on the committee. Those organizations represented and contributing to the support of the committee's work are American Institute of Electrical Engineers, American Electric Railway Association, American Railway Engineering Association, National Electric Light Association, American Gas Association, Natural Gas Association of America, American Telephone & Telegraph Co., American Water Works Association and the National Bureau of Standards.

The report may be obtained from any one of these associations, although the handling of it is by the American Institute of Electrical Engineers, from whose representatives the chairman, Bion J. Arnold, is chosen. The address is 33 W. Thirty-ninth Street, New York. A nominal charge of \$1 covers cost of distribution, but this charge is not at all intended to be or to represent the cost of the book, whose publication has been financed by the supporting organizations.

Electric Railway Lubrication*

The Author Enumerates the Principal Uses for Oil in Electric Railway Equipment and Describes Precautions That Should Be Taken To Insure Satisfactory Operation

BY DEAN TREAT

Lubrication Engineer Standard Oil Company of Indiana

THE lubricating engineer's duty is to reduce friction by proper oil and its proper application. A great deal of the success secured in the reduction of oil costs can be traced to the use of a cost system, whereby comparisons are made from month to month of lubricants and bearing metal. These two items go hand in hand as too little oil means excessive bearing costs and too liberal oiling means a rise in the cost of lubricants. The plotting of curves or comparative figures month by month by heads of departments furnishes the key to reduction in the costs or to changes in methods of oiling whereby good results can be obtained.

The average cost per thousand car-miles generally is about 25 cents, but if costs are lower than this average figure the management should not be entirely satisfied. Comparisons should be made monthly on bearing metals and lubricants in order to have reliable data. Each railway property has its own problems to work out and no rules can be devised for lubrication excepting in a general way.

Armature speed varies from zero to 1,500 r.p.m. and the bearings can be classed as medium speed bearings. The older type motors were grease lubricated, but at the present time this class is rapidly disappearing. Before the grease was warmed up sufficiently to flow and give the necessary film to keep metal from metal, particles of bearings were being removed and the life of bearings was from 3,000 to 5,000 car-miles. It was also necessary in hot weather to grease them daily and sometimes oftener. Operators frequently attempted to change these grease bearings to oil by substituting waste and oil. Due to the size of the slot in the bearing it was not usually successful, due to insufficient area of contact with the waste. In some cases manufacturers have substituted new motor frames with modern waste and oil lubrication and good results have been obtained. The use of felt on old type motor axles with waste packed on top gave fairly good results, but oil poured on top of the waste made it soggy and the oil fed as rapidly while the car was standing as in motion.

Modern bearings for armatures are of the solid sleeve type, ball or roller bearings. Sleeve type bearings on modern motors are solid, the pinion end being larger than the opposite one due to its needing greater strength. They may be of hard metal lined with babbitt, or solid bronze or babbitt.

Semi-modern motors used the split type bearings employing either bronze or hard metal lined with babbitt. The keying of the above was secured with dowel pins and holes and frequently a key in addition. The modern type use dowels in the flange or shoulder. It is very necessary to prevent movement of the bearings in order to secure long life, as movement changes the bearing pressure area.

Clearances between axles and bearings vary from .006 minimum to .016 maximum on diameters $3\frac{1}{2}$ in. to 7 in. Successful lubrication requires clearance so that the lubricating film can be maintained so as to prevent seizing or rapid wear of bearing metal.

Axle bearings are always of the split type to allow interchanging and to prevent excessive labor as the solid type would make it necessary to remove the gear and wheel in order to renew or replace a bearing. These bearings need special attention as loose bearings allow poor meshing of gear and pinion teeth and frequently form a new pitch line. If kept closely fitted long life is secured and they are not worn to knife edges so rapidly. Electric current causes a great deal of trouble at this point and aids in breaking down the oil film. Axle collars that become loose cause a great deal of trouble on both gear and pinion and also affect the life of axle bearings.

Journal bearings need attention at the box cover, dust collar and the guard. Dust and water entering cause a great deal of trouble, water especially, as it floats the oil and prevents syphoning of oil. It is very necessary that journal bearing edges do not touch the journal as they act as a scraper and wipe away the oil film. Probably more hot boxes occur from this source than any other. Worn pedestals and boxes allow jamming of journal bearings and should not be allowed to exist. With welding machines as now produced this condition can be easily prevented by building up and grinding to original size.

GEAR AND TROLLEY LUBRICATION

Grease or heavy pitch like oils are used in gear cases. With tight gear cases heavy gear oils are used, allowing only a small portion of the gear to dip into the oil in the bottom of the gear pan. Some operators prefer a grease entirely and cord and wood chips have been used to deaden the noise. The addition of too much fiber increases the power consumption, similar to the use of asphaltums that congeal at low temperatures.

Air compressor lubrication depends considerably upon the fit of piston and rings on the cylinders. These parts should be kept in proper fit in order to permit the use of lighter oils. Trying to overcome mechanical defects with lubricants is not good practice. Horizontal lubrication is apt to be overdone, and guides to prevent too much drip of the splash system recently employed are very successful. Herringbone gears are rapidly supplanting chain compressor drive. Churning of oil by the gears due to too high a level is being taken care of on modern compressors by a trough that controls the dip into the oil. Air brake cylinders should be overhauled and cleaned every six months and lubricated by use of a good grade of semi-fluid grease, especially on the leathers.

Trolley wheel lubrication is secured by grease on some and oil on others.

Some types of wheels are equipped with graphite bushings in which the

manufacturers claim that no lubrication is necessary. Generally railway operators oil these regardless of the graphite bushing in order to increase their life.

Too high a tension on the trolley pole caused by poor trolley bases affects the lubrication of the wheels inasmuch as the bearing pressure is increased above normal. In the use of ball and roller bearing bases it has been possible to increase the life of the trolley wheel due to their free movement and the lubrication is much more satisfactory than with the old type bases.

The life of trolley wheels depends greatly upon the service to which they are subjected, viz., the amount of current that flows through the wheel. The higher the amperage the greater the heat, which makes more necessary good conductivity for this current from the wheel into the trolley pole. Inasmuch as there is an oil film between the wheel and the spindle this is rather a serious proposition. The use of graphite greases is much more satisfactory in conducting this current than straight oil or ordinary greases, as the current passes more freely through the graphite grease.

TRACK CURVE OILING PREVENTS WEAR

Track or curve oiling is done to prevent cutting of the rail or flanges of the wheels. This is done with a grease or asphaltum lubricant, the latter gaining in use due to its adhesiveness. Too liberal a quantity applied usually causes the top of the rail to be coated, which, in turn, causes danger of sliding of wheels and accidents.

Two general classes of babbitt metal are used for armature, axle and journal. Sentiment appears to be in favor of high tin base metal for armatures and lead base for axles and journals. Some railways are going to bronze bearings throughout, using a skin of babbitt, while others are using the straight bronze bearings.

Long fiber wool yarn waste is most generally used for armature and axle bearings, but cotton waste is growing in favor for journal bearings. Some use metal turnings in the cotton waste to give it elasticity. A great many companies use straight wool waste throughout, using the new on armature and axle bearings and used waste on journals.

Waste saturation is an item of great importance, and waste should be submerged in oil for forty-eight hours and then drained for twenty-four hours. An oil room should be provided and the temperature should not be lower than 75 deg. F. Oil should never be poured on waste in a bearing, but alongside of it to prevent the waste from becoming soggy. On the modern type motors oil wells eliminate this trouble. Oilers should not forget to loosen up the waste packing at least once a month and renew it at least each six months. Waste washing and reclaiming is gaining in favor with larger companies and is worth consideration, depending upon waste loss and cost of installation.

All lubrication should be done on a car mileage basis instead of by days operation. If railway managers would appoint men thoroughly to follow up their lubrication, bearing practice and cost system a great reduction in cost would be secured. Too little attention is given the lubricants and bearing metal and to the application of them. This condition should be changed as high friction means higher costs.

*Abstract of a paper presented at the first annual convention of the American Society of Lubrication Engineers, held at Chicago, Ill., Oct. 12-13, 1921.

Waste in Industry

Preliminary Movement Toward Reduction of Waste in Industry Reflected in Report of Committee Now Published in Book Form

THE report of the committee on elimination of waste in industry should have a concrete effect in focusing attention of engineers and other leaders in industry upon the subject of the inefficiencies of the nation's industrial machine. Preliminary and partial indications of the scope of this report and some of its conclusions have been given from time to time in these columns as work progressed. The publication of the final and complete report in book form should do much to stimulate interest and encourage study of the problems which it attacks and of some of the facts or indications which it outlines.

This report, it will be recalled, constitutes the first piece of public service undertaken by the Federated American Engineering Societies, which came into being exactly a year ago today. Herbert Hoover, in his address at the opening meeting when he was elected president, pointed to the existing restrictions and waste in industry and suggested the investigation of this subject as being the most worth-while contribution the new organization could make at that time. Acting upon authority from the American Engineering Council, the governing body of the Federated American Engineering Societies, he appointed a committee of seventeen in January of this year, who reported to the meeting of the Council on June 3, the present final report being the completed form.

In introducing the report in its final form, Herbert Hoover presents the following foreword:

"This reconnaissance report on waste in industry is the result of five months of intensive study, carefully planned and rapidly executed. A part of its value lies in the speed with which the work has been done and the promptness with which it presents definite lines for future action. It reveals facts which may serve as a foundation for an advance in American industry. It has a special message for government officials, financial, industrial and commercial leaders, labor organizations, economists, engineers and research groups, the public and the press.

"We have probably the highest ingenuity and efficiency in the operation of our industries of any nation. Yet our industrial machine is far from perfect. The waste of unemployment during depression; from speculation and over-production in booms; from labor turnover; from labor conflicts; from intermittent failure of transportation of supplies of fuel and power; from excessive seasonal operation; from lack of standardization; from loss in our processes and materials—all combine to present a huge reduction from the goods and services that we might all enjoy if we could do a better job of it."

It is hardly to be expected that accurate or definite conclusions can be drawn from this report. While it is, in nature, an engineering report, it is an engineering report in a field in which other elements than engineering are present. Its value lies in trying to apply the engineering method of analysis to a subject which has confounded most economists and industrial students in their attempts to find a

definite solution. Perhaps the chief criticism which can be directed toward the present report is that it falls into the more or less easy and common phraseology of the economist and industrial student with reference to those conclusions which it does try to make rather than retaining the engineering method of analysis and conclusion without the least variation.

It is only fair to point out, however, that this problem has successfully resisted all other methods of attempted solution and if the engineers have made any progress in analyzing it and portraying methods of attack, they have to that extent made a noteworthy contribution.

Actually the report is based upon an "assay" of six industries of the country; namely, the building industry, men's clothing manufacturing, shoe manufacturing, printing, metal trades and textile manufacturing. To this is appended general reports on the following subjects: Unemployment, strikes and lock-outs, legal machinery for adjusting disputes, industrial accidents, health of industrial workers, eye conservation and purchasing and sales policies. While the details of the six assays are of particular value only to those and related industries, it is an advantage to have these general reports collected and it is also of value to see how the investigation has been made in other industries.

For example, Chapter 4 is devoted to the method of assay which was used by the committee in its investigation of the various industries. Any other industry can learn much as to the advantageous methods of analysis of its lost motion by a study of this method of assay, which includes a description of the questionnaire and valuation sheet used by the committee.

The report has been published by the McGraw-Hill Book Company as a 409-page, 6 x 9 cloth-bound book. The societies are placing a nominal charge of \$4 for the book, the preparation of the text having been financed by the societies.

Personnel of C. E. R. A. Engineering Council

FOLLOWING approval by the executive committee of the plans tentatively adopted at the summer convention of the Central Electric Railway Association for a subsidiary organization which would give the engineers of the territory greater activity and a better opportunity to interchange experience and ideas, the personnel of the organization has been selected. As pointed out in the *ELECTRIC RAILWAY JOURNAL* for Oct. 15, page 699, the organization consists of an engineering council which also comprises four geographic sections. It is provided that the second vice-president of the association shall be chairman of the council and that two other members of the executive committee shall be members. The other four members are to be the directors of the four local sections, which are each to meet three times a year with one joint meeting at the time of the annual convention of the association. Given in that order the members of the engineering council are:

G. T. Seely, vice-president and general manager, Pennsylvania-Ohio Electric Company, Youngstown, Ohio, chairman; Harry Reid, Indianapolis, Ind., H. C. De Camp, Dayton, Ohio; Pierre V. C. See, Akron, Ohio; E. B. Gunn, Wapakoneta, Ohio; G. D. Nicoll, Springfield, Ohio; and Adolph Schlesinger, Indianapolis, Ind.

The members appointed to the executive boards of the four local sections are as follows:

Northern Section: E. B. Gunn, superintendent and master mechanic, Western Ohio Railway, Wapakoneta, Ohio, director; W. E. Richards, Toledo, Ohio; H. W. Savage, Detroit, Mich.; R. C. Taylor, Albion, Mich.; J. R. Lawrence, Wauseon, Ohio; A. V. Brown, Sandusky, Ohio; and Allen Karns, Bowling Green, Ohio.

Western Section: Adolph Schlesinger, superintendent of distribution and substations Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.; director, T. H. David, Indianapolis, Ind.; R. N. Heming, Fort Wayne, Ind.; Frank H. Miller, Louisville, Ky.; L. A. Mitchell, Anderson, Ind.; T. W. Osborne, Lebanon, Ind.; and Charles Sigler, Warsaw, Ind.

Eastern Section: P. V. C. See, superintendent of equipment Northern Ohio Traction & Light Company, Akron, Ohio, director; A. B. Creelman, Youngstown, Ohio; Lawrence D. Bale, Cleveland, Ohio; Guy H. Kelsay, Elyria, Ohio; C. H. Folwell, Parkersburg, W. Va.; H. J. Mayer, New Brighton, Pa.; and R. D. Miller, Alliance, Ohio.

Southern Section: G. D. Nicoll, superintendent of equipment Ohio Electric Railway, Springfield, Ohio, director. The names of the other six members of the executive board of this section have not yet been made available.

American Association News

Mid-Year Dinner Committee

PRESIDENT TODD has appointed the following as the special dinner committee for the mid-year conference: Harry Reid, Indianapolis, chairman; S. W. Greenland, Fort Wayne; L. E. Gould, Chicago; Myles B. Lambert, East Pittsburgh, and E. C. Faber, New York.

Committee Activities Under Way

ALREADY the committees of the American Electric Railway Association are picking up their activities.

The Executive Committee is scheduled to hold its next regular meeting in Indianapolis on Dec. 2, at 10 a.m., in the office of President R. I. Todd.

A meeting of the papers committee has been called by Chairman C. D. Emmons to meet at Association headquarters on Nov. 25, at 10 a.m.

The publicity committee has been called by Chairman J. N. Shannahan to meet at Association headquarters on Nov. 26, at 10 a.m.

The membership committee, which has a large program ahead of it, has been called by its chairman, F. R. Coates, to meet in Indianapolis on the afternoon of Dec. 2, after the meeting of the executive committee.

Recent Happenings in Great Britain

Expiration of Term of War-Time Control Over Buses Creates Problems for Tramways—Leeds Reports Deficit

(From Our Regular Correspondent)

The most important subject discussed at the annual conference of the Municipal Tramway Association, which was held in Salford, Manchester, on Sept. 28 and 29, was the question of possible unlimited competition by privately owned motor omnibuses with municipal tramways. Hitherto municipalities have had a certain amount of control over the running of buses by other people, but an act of Parliament which gave them expired with the recent official termination of war. The matter will now be regulated under the roads act of 1920.

J. B. HAMILTON, general manager of Leeds City Tramways, who brought forward the subject, quoted the opinion of a legal authority as to the effect of the act. It was that whenever application is made for a license for an omnibus to ply for hire, unless there are valid reasons for refusing it, the application must be granted. The licensing authority would not be justified in refusing a license merely on the ground that running of vehicles would set up competition with tramways or omnibuses of local authority. On the other hand, Mr. Hamilton pointed out that should licensing authority be of opinion that sufficient services are already provided, they may refuse to license, but the applicant has the right to appeal to the Minister of Transport. The latter might say that: If a road was already sufficiently served, proposed buses were unnecessary, but he might take the opposite view.

This was the difficulty and uncertainty before the conference. Tramways, it was insisted, form a monopoly granted by Parliament under proper safeguards and conditions, and they cost great sums to construct. It was, therefore, contended that they should not be subjected to the competition of vehicles which were under no regulation. If buses were needed on routes where there were no tramways, they should be run by the local authority. In the end the conference adopted a resolution declaring that the roads act encourages wasteful and overlapping competition which will result in increased traveling charges to the public and is contrary to the intentions of Parliament. It was further agreed that representations be at once made to the Ministry of Transport urging statutory regulation in the public interest.

J. M. McElroy, general manager of Manchester Tramways, presented a paper showing the growth of traffic in recent years and the important fact that the percentage increase in the average fare per passenger was a long way below the percentage increase in operation costs. A suggestion was made that the shilling should be decimalized, so as to give a coin of slightly higher value than the present penny. The high cost of permanent way construction would, unless materially reduced, put strict limits to tramway extensions and must lead to the increased use of motor bus and the trolley bus.

A plea for freeing tramway undertakings from a large part of the cost of maintaining the street surface between the rails was made by **W. Chamberlain**, general manager of Oldham Tramways. The grievance is an old one, but it is becoming more and more acute owing to the increasing wear of the streets by heavy automobiles. At the close of the conference, **Alderman R. Mayne**, deputy Lord Mayor of Newcastle-on-

Tyne and chairman of the Newcastle Tramways Committee, was elected president of the association for the ensuing year, and **J. Timpson**, Mayor of Portsmouth, was elected vice-president.

The Ministry of Transport is evidently alive to the grievance of tramway authorities over the question of maintenance of road surfaces. **Sir Henry Maybury**, director-general of the roads department of Ministry, addressing a meeting of the Commercial Motor Users' Association early in October, said that a matter which must soon engage the attention of his department was the burden on tramways for road maintenance. He suggested that tramway authorities go to Parliament for relief, and expressed the opinion that if they were relieved of road maintenance they should pay for the use of the road.

NOTHING LIKE THIS IN AMERICA

A peculiar tramway trouble is reported by **Mr. Dalrymple**, the manager at Glasgow. There is a shopkeepers' half holiday every Tuesday, and the public houses, like other shops, are closed in the afternoon and evening. In the districts outside the city boundary, however, the licensed premises are open on Tuesdays. A result is that during part of the evening cars going to the country districts are besieged by people seeking drink. They return later on, a great proportion of them intoxicated. Not only do they fill cars to the exclusion of the ordinary passengers, but they often behave in a disorderly manner. The conductors and inspectors accordingly have a bad time. The fundamental remedy, so far as the tramways are concerned, would be to have the Glasgow "saloons" open instead of closed. To arrange for the rural public houses being closed on Tuesdays would be difficult, as various local authorities are concerned. I have not heard of any similar trouble in England. In London, at all events, nothing of the sort occurs because the public houses are not closed on the shopkeepers' half holiday.

The Leeds City Tramways, which used to be a prosperous concern, is not doing well. A return for twenty-two weeks ended Aug. 31 last shows a deficit of £36,634, or 2.335d. per car-mile run. For the corresponding period of last year the loss was £1,863, or 104d. per car-mile. The income has decreased and the expenditure has increased. Both passengers and miles run show a falling off. The circumstances are not very favorable for celebrating a jubilee, but the undertaking completed fifty years of existence on Sept. 16. In the early days horse cars were used; these were succeeded by steam cars; the first electric line was opened in 1891.

In 1894 the Leeds Town Council purchased the private undertaking and

proceeded to electrify the various lines. Figures just issued show that the total cost of running the rail-less electric cars of York Town Council, including capital charges, amounts to 1s. 7d. per car-mile. For electricity, solid rubber tires and wages alone the expense is 11½d. per car-mile run. The consumption of energy is 1.42 units per car-mile and the price at which it is purchased is 2d. per unit. The cars are single-deckers, seating twenty-four passengers, and are worked on the one-man principle. This is the most recent installation of trackless trolley system in the country.

The Metropolitan Railway, the Metropolitan District Railway and the London Electric Railway early in October put into operation improved services. Longer trains are run during the busy hours, the services are continued later at night, and the non-stop trains have been increased in number. To a certain extent the changes are restorations of service reduced about a year ago. The new development has been facilitated by the delivery of new cars, which were described in this journal some months ago.

The geological adviser to the Channel Tunnel Company recently stated that there is good reason to believe that the government is now generally favorable to the scheme. Revised plans have been prepared under which the tunnel will be placed at such a depth as to render it invulnerable to submarine attacks. The proposal for a railway tunnel under the Strait of Dover to connect England with France has been before the public for many years, but military considerations have prevented the work from being carried out. The scheme if executed will involve a large installation of electric traction. The new relations which have grown up between Britain and France may result in the tunnel being constructed.

A strike of Salford tramway employees, which lasted for only a few days and ended on Sept. 17, is worth noting because of peculiar reason for it. A number of inspectors and traffic clerks withdrew their membership in the United Vehicle Workers' Union in order to join the National Association of Local Government Officers. The union objected and its tramway members in Salford went on strike. A settlement for the time at least was arrived at by referring the matter to the consideration of a negotiating committee.

The Bradford Town Council intends to apply for Parliamentary powers next session to carry goods up to the weight of 20 tons on the tramways of the city. The street gradients are very heavy, rendering street transportation of goods by horse or automobile vehicles difficult, and it is thought the situation may be eased by utilizing the tramways for freight work.

Sir Philip Dawson, the well-known consulting electrical engineer, has been elected member of Parliament for West Lewisham. He had a large majority of votes over his two opponents.

The fifth international commercial motor exhibition, organized by the Society of Motor Manufacturers & Traders, is being held in London from Oct. 14 to 22. The exhibits include a wide variety of petrol, electric and steam road vehicles for passenger and goods transport. Motor omnibuses and motor coaches are represented, some with pneumatic instead of solid rubber tires.

News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

New Orleans Negotiations Halted

Settlement There Apparently Must Await End of Controversy Between City and State

Another hitch has been encountered in working out a settlement of the utility problem in New Orleans. As the matter was being thrashed out by the city and the representatives of the several classes of the security holders with a reasonable degree of hope that some amicable solution would be found, a sudden and unexpected jolt was given the negotiations by the State Supreme Court. The new cause of delay is due to the opinion handed down by the court of last resort on Nov. 12, recalling a prohibition writ issued last summer, granting the city a stay of proceedings against a restraining order given to the State in the Civil District Court, by Judge King.

The restraining order of the Civil District Court, it will be recalled, was based upon the contention of the State of Louisiana, through Assistant-General Hall, since deceased, that on information received, the city was about to enter into a compact whereby the railway was to charge fares in excess of 5 cents. This the state contended was in violation of the franchise rights the railway had obtained from the State. It was further averred that the city contemplated allowing an excessive rate of return upon an excessive valuation of the property of the railway.

The recall of the writ will now have the effect of reopening the proceedings *de novo* upon the application of the State that the city was without legal authority to enter into negotiations with the railway not in keeping with the franchises of the railway.

Mr. Hall, in behalf of the State, in his petition in opposition to the application of the city for a writ of prohibition, alleged that:

1. The city had an adequate remedy by an appeal from any order or decree that the Civil District Court might eventually render in the case.

2. The city did not, in the lower court, plead to the jurisdiction of the court or move to have the order of that court rescinded and did not except to the proceedings in any way.

3. The lower court had jurisdiction of the case and Judge King did not exceed his jurisdiction in issuing the restraining order.

The opinion handed down on Nov. 12 upheld Mr. Hall's contention concerning the lower court's jurisdiction. The opinion declared:

The city's contention that the court has no jurisdiction seems to rest upon the idea the purpose and object of the suit, and the function of the temporary restraining order, was to interfere, generally, with the legislative power and function of the municipal council.

On the contrary, an analysis of the prayer for injunction shows that the true and only object was to prevent the municipal council from contracting, with regard to the street railway franchises, beyond what the state alleges is the limit of municipal authority.

We must bear in mind the State is the author of the municipality's authority to take such contracts. If the Civil District Court eventually should decide the state is not entitled to the relief prayed for, it will be, not for want of jurisdiction over the

subject matter, but for want of a cause or right of action.

If the Civil District Court should conclude the contemplation proceedings of the municipal council, of which the state complains, are matters over which the municipal council, as a legislative body, has exclusive authority, the court will not interfere. But the judgment of the courts, in determining whether the proceedings contemplated by the municipal council has exclusive authority, would be an exercise of jurisdiction on the part of the court.

This suit was not an attempt at unlawful interference with the right of the municipal council to bring the railway problem to a settlement, if possible, and, to that end, to hold conference with the committees and organizations referred to.

The restraining order complained of, or the injunction prayed for, could not have prevented or interfered with such conferences or proceedings, so long as they did not result in a contract beyond what the state alleged was the limit of the commissioners' authority.

Whatever the decision in the District Court, it is not improbable that an appeal will be taken to the Supreme Court by either party to the controversy.

Two points in the pending negotiations which yet await settlement and which were being discussed when the Supreme Court hurled its bomb among the conferees were the so-called "set-up" and the dividends of common stock.

The financial set up of the reorganized company contemplates the creation of a reserve fund with which to retire the 4½ per cent bonds, under certain stipulated conditions, for replacements and betterments. This movement has developed a three cornered deadlock as yet untangled. The proposed reserve fund amounted to \$200,000, which was to be divided equally for improvements and retirements of the bonds. This fund was to have been created before the declaration of any dividends on the common stock of the company.

G. M. Dahl, representing the junior security holders, is said to have been strongly opposed to this course, though the representative of the holders of the 4½ per cent bonds held out for such a safeguard to their interests and were supported by the city in insisting that such a provision should be inserted in the compromise agreement.

The representatives of the security holders have left for New York and, like the Commission Council of New Orleans, will await the end of the legal tangle in which the city and the railway company now find themselves.

Maximum Award for 213 Trainmen

According to a count completed on Nov. 1, 1921 employees of the Los Angeles (Cal.) Railway out of 2,163 will receive a cash bonus at Christmas as a reward for efficient service rendered the public and the company.

Two Bells, the official publication of the railway, states that only 182 trainmen now in service will not participate in the bonus, and the reason assigned is that they have not been in the service six months.

The full bonus for twelve months at the rate of \$5 per month will be awarded to 213 trainmen.

New York Transit Commission Begins Hearings

Plans Are Outlined and Bases Established for Further Discussions at Early Sessions

Public hearings on the plan of the New York Transit Commission for the consolidation of all of the traction lines of New York began on Tuesday morning, Nov. 15, as announced. In his opening statement, Chairman McAneny reviewed the powers of the commission as conferred upon it by the last Legislature, and then referred to the outline of the tentative plan of the commission for the consolidation of the lines in New York City, as published in abstract in the issue of this paper for Oct. 1, 1921.

In conclusion, Mr. McAneny said, in part:

It is the purpose of the commission not only to bring about a physical reorganization of the roads for purposes of better travel and better development of the rapidly growing city but to restore as promptly as may be the citywide fare and an actual and honest charge of 5 cents. The commission, in its report, has pointed out many eliminations and reductions of cost that ought naturally to follow the municipalization of the roads, the unification of operation and the application of the strictest business principles in the administration of their affairs.

Through these means it hopes not only to restore an actual 5 cent fare but to keep the fare indefinitely at 5 cents.

INQUIRY INTO EXPENSE ACCOUNTS OF COMPANIES

The chairman then declared that one of the first acts of the commission would be to go over the expense accounts of the companies, and as it would take too much time for the committee, as a whole, to do this for all of the accounts, the committee as a whole would examine the accounts of the Interborough Rapid Transit Company for June, 1921, of the New York Consolidated for May, of the New York Railways for April, Third Avenue Railway for March, Brooklyn Rapid Transit for February, Second Avenue Railroad for January, New York & Harlem Railroad for December, 1920, Eighth Avenue Railroad for November, Ninth Avenue Railroad for October, the lines in Queensboro for September, and the Staten Island lines for August. The accounts for the other months for each of these companies will be examined by individual commissioners.

Assistant City Corporation Counsel Kohler then challenged the powers of the commission to carry out any such plan as it proposed, and declared the statute under which its powers were granted to be unconstitutional, according to both the State and Federal constitutions and consequently the acts of the commission to be invalid and void. He urged the commission to abandon its proceedings at least until representatives of the city of New York should be able at the next Legislature, which would convene in January, to introduce a bill to cover the situation. The chairman, however, declined to discontinue the proceedings.

The special counsel for the commission, C. J. Shearn, then outlined the course which the commission intended to follow. He said he proposed first to show that although the number of passengers had greatly increased, the number of car miles had not increased in proportion. Consequently the quality of the transportation given was not as good as formerly. He declared also that maintenance had not been kept up, particularly on the surface lines, and this meant delays to the service. Later, the commission expected to take up the condition of each company through its president or receiver to see what they had to say on the subject, both as the causes of the present condition and the remedy, particularly the plan proposed by the commission. A similar course would then be followed with the various protective committees representing the bondholders so that the commission could learn their attitude toward the plan. Then the commission would consider what savings could be effected by changes in the physical layout and other changes, and the reduction of the number of franchises, which now amount to more than 1,000. Finally, the question of valuation would be taken up. Work on this question has been carried forward by members of the staff of commissions, and it was expected that valuations would be completed by the end of the year.

In referring to the matter of valuations Mr. Shearn said that the commission had been establishing valuations on these four different bases:

1. The investment value obtained from the books of the company, as to the amount of money actually expended, less depreciation.
2. Cost of reproduction on a pre-war basis, less depreciation.
3. Cost of reproduction at present prices, less depreciation.
4. Finally, as required by the law, on the basis of prospective earnings under the legal or franchise rate for fare.

The rest of the two sessions on Monday was devoted to the presentation of testimony by representatives of the commission on statistics of operation and on franchises.

FRANCHISE EXTRACTS INTRODUCED

Ralph R. Monroe read extracts from the franchises of a number of the companies. In general they provided for a 5-cent fare but in many cases this fare was specified only between certain limits and in some instances the fare was not directly mentioned.

Frederick W. Lindars, accountant for the commission, gave figures on the number of passengers carried, an increase of 27.7 per cent from 1917 to 1921, while the ratio of seats for passengers in that period had materially decreased. The witness also gave figures upon the reduction of the number of free transfers.

John H. Madden, engineer and head of the Valuation Bureau for the commission, gave figures on maintenance of way and equipment. He said that taking 100 as the index figure in 1912, the cost of labor had increased to 208 in 1920 and materials to 308. The following table of decreased maintenance figures was compiled from his testimony:

Company.	Spent in 1912.	Same Figure in 1920 Values.	Actually Spent In 1920.
N. Y. Rys.	\$2,035,441	\$5,454,952	\$3,036,370
3d Av. Rys.	1,370,129	3,673,266	2,608,528
B. R. T.			
surface	2,683,970	7,193,040	5,472,065
Queens lines	492,802	1,320,709	685,136
Richmond lines	168,522	451,629	234,492
2d Av. lines	134,911	361,561	247,799

Figures also were presented to show that the roads had caught up on their maintenance work in 1921.

Harry N. Latey, engineer of equipment and operation for the Transit Commission, then testified that the breakdowns and delays of more than five minutes on these transit lines had increased enormously as the funds for maintenance were comparatively decreased. The increases varied from about 25 per cent to 202 per cent.

Daniel L. Turner, consulting engineer to the commission, presented testimony that on many of the surface lines there had been a general increase in passengers carried, but a decrease in car miles run.

Railway Ready to Comply

Detroit United Preparing to Discontinue Service on Lines Included in Ouster

Following the election at Detroit, Mich., in which the people approved the ouster ordinance requiring the Detroit United Railway to remove its tracks from Fort Street and Woodward Avenue on the sections where franchises have expired, Allen F. Edwards, vice-president of the company, issued a statement to the effect that the company would comply with the action of the authorities as indorsed by the voters.

COMPANY'S ATTITUDE MADE PLAIN

Mr. Edwards stated that according to his understanding of the situation the election returns must be accepted by the Common Council through the report of the board of canvassers. If this acceptance is made at the Council meeting on Nov. 15, then the ouster ordinance gives the company ten days in which to discontinue service and ninety days in which to remove its tracks and overhead equipment from the streets. This will make the suspension of service effective not later than Nov. 25.

In his statement he cited that the tracks involved are Woodward Avenue, from Milwaukee Avenue south to the river, and Fort Street, including West Jefferson Avenue, from Artillery Avenue to the eastern terminus of the line. He further stated:

It seems unfortunate that a satisfactory price for the lines to be ousted could not have been agreed upon. The price of \$388,000, which was named by the city as the amount they were willing to pay for these lines, we considered in no way consistent with the value of the property proposed to be taken over, and have therefore declined to accept it.

The company has, he stated, suggested arbitration as a means of arriving at a fair price for these properties. This seemed to its officials to be a means by which service to the public could be continued.

It is further cited in the communication that as a result of the ouster ordinance becoming effective, it will be necessary for the company to turn its Woodward Avenue cars at Grand Belt (Milwaukee Avenue) and the West Jefferson and Fort Street cars at Artillery Avenue. The company expects to operate the remainder of its lines as a unit and to render to the public the best service which it is possible to give under the conditions imposed upon it.

The company has communicated with the Council asking for permission to install the necessary Y's on which to turn its cars at the ends of the lines over which service is to be suspended. It is pointed out in the communication that

the Y's on Fort Street and West Jefferson Avenue lines may be used for turning cars by both the Detroit United Railway and the city, and suggested that the installation and maintenance of the equipment be made the subject of a joint agreement between the company and the city. It is understood that the Y at Woodward and Milwaukee will be used exclusively by the company.

Mayor Couzens stated that he was much pleased with the support of the people of the progressive program and that he would feel encouraged to finish up the job which has been started. He was particularly pleased that the administration has been empowered to use the trackless trolley if it seemed desirable and that the people have supported the officials in their campaign to get control of the streets for which they have fought so many years.

No definite announcement has been made by the Mayor or the Street Railway Commission as to what the next step will be, but it is believed that an effort will be made to reach an agreement for an exchange of running rights over the lines in controversy.

Conference in Saginaw Awaited

The protective committee of the bondholders, and other creditors in New York of the Saginaw Bay-City Railway were asked Nov. 16 by the City Council of Saginaw, Mich., to confer in Saginaw in the near future to discuss the traction problem there. Resumption of railway service in the city will be the objective of the conference discussion.

This action is the result of the request of the City Council that Otto Schupp, receiver for the defunct company, wire the creditors for a meeting at the earliest possible date. The Council intends to discuss openly with the committee from New York what plan they can accept as a settlement of the transportation problem.

The transportation situation has so aroused the people who have been dependent upon jitney buses since the railway ceased operation on Aug. 10, that recall petitions for the Mayor and four Councilmen were started in circulation Nov. 16.

Steam Roads Will Not Electrify

Maurice E. Spratt, counsel for the New York Central and "Nickel Plate" Railroads, has informed the municipal authorities of Buffalo, N. Y., that neither road plans to heed the ordinance enacted recently which provides that steam roads entering Buffalo must electrify their lines before Jan. 1, 1923, and submit plans for the electrification before Jan. 1, 1922. It is claimed the cost of electrifying all lines entering the city would run between \$75,000,000 and \$100,000,000.

We are chartered by the state to operate our lines as we do now, said Mr. Spratt's statement. The City Council of Buffalo or any other city has no authority to compel us to electrify. The ordinance is invalid and will not be obeyed. The cost would be too great, even if electrification were practicable.

Representatives of other steam rail lines entering Buffalo said that assuming the city has authority to order electrification, the short interval between the enactment of the ordinance and the time for filing plans for electrification would cause any court to declare the statute unreasonable.

Election Lends Complications

Change in Administration in Buffalo Spurs Present Incumbents to Renew Action

The City Council of Buffalo, N. Y., has voted \$25,000 as an initial appropriation to prosecute the action brought before the Public Service Commission in an effort to restore the 5-cent fare on the local lines of the International Railway. The International now is collecting a 7-cent fare or four tokens for 25 cents.

John C. Brackenridge, valuation expert who assisted the municipal authorities in their last rate case against the International, and Milo R. Maltbie, former member of the Public Service Commission, will assist the city. Both traction experts have held conferences with William S. Rann, corporation counsel, and Frederic C. Rupp, deputy city attorney, who will have charge of the city's fight.

Some opposition to the prosecution of a rate case at this time has developed and even the city law department has warned the members of the City Council against such a proceeding at this time, but Frank C. Perkins, the Socialist member of the City Council, is insistent that the city proceed at once with the case before the Public Service Commission.

Newspapers opposed to a rate proceeding at this time brand the action of the Council as "a fishing excursion." An editorial in the *Commercial* says by bringing the action just before election, it appears that some members of the Council are playing for public favor.

Mayor George S. Buck, who has opposed the railway since he took office six years ago and whose fight against the traction company resulted in a sale and complete reorganization of the system, was defeated for re-election by the anti-prohibition candidate, Frank X. Schwab, a brewer.

Other newspapers, commenting on the action of the Council, at this time say that lower fares will mean bankruptcy, inadequate wages for employees and poorer service. The municipal bureau of public utilities has called attention to the fact that 200 fewer cars are being operated this fall than a year ago and 300 fewer cars than two years ago. The report submitted to the Council says that, "unless more cars are run this winter, the service will be the worst in the history of the city."

The Mitten Management, Inc., Philadelphia, which has a contract for operating the local and interurban lines of the International system, says that sufficient cars are being operated to meet traffic requirements and that the running time has been speeded up to offset any cars which have been taken off during the non-rush hour periods.

Railway Must Pay City

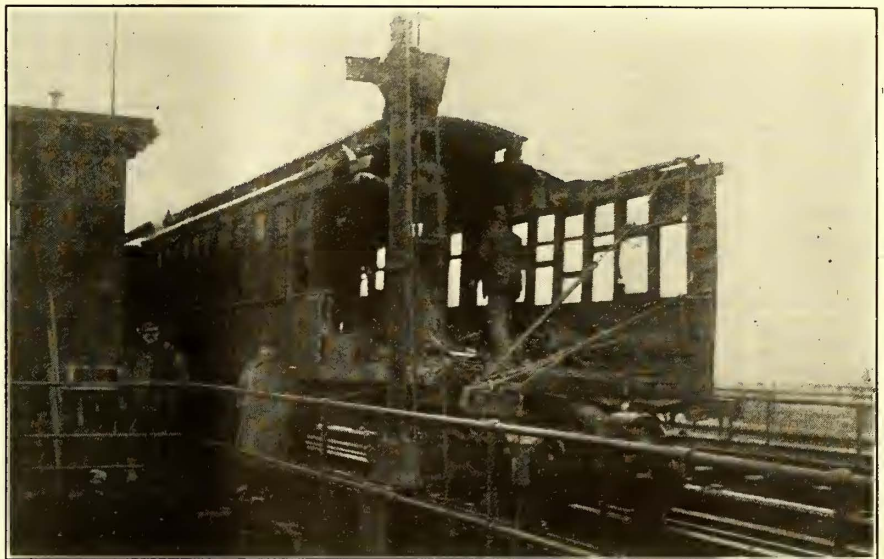
A judgment of \$19,956 in favor of the city of Jamestown against the Jamestown (N. Y.) Street Railway has been awarded by Supreme Court Justice George E. Pierce. The amount represents the sum alleged to be due the city in unpaid percentages on gross earnings of the traction line. The judgment was taken by default. Although George E. Maltby, general manager of the Jamestown Street Railway, was in court with Marion H.

Fisher, its attorney, no answer was made.

A section of the franchise granted the company in 1891 provides that the railway should pay to the city each year 3 per cent of its gross earnings. The judgment covers the amount due for the period between June 30, 1915, and June 30, 1920. Counsel for the city informed the court that the railway had promised to settle the case, but had continuously neglected to do so.

Thirty Hurt in Rear End Collision

Thirty passengers were injured in the rear-end collision on the Interborough Rapid Transit line near Woodside, Long Island, recently. A six-car steel subway train standing at the Fisk Avenue station of the Corona line was rammed by a Manhattan bound train of two wooden cars. Twelve feet



REMAINS OF WOODEN CAR SHATTERED IN WRECK

of the first wooden car were shattered and the rest of the car jammed onto the top of the last steel car of the stalled train.

Mr. Witt Sees Great Future for Seattle

The idea of municipal ownerships is growing fast. This opinion was recently expressed by Peter Witt, Cleveland transportation expert, in speaking before members of the King County Democratic Club, Seattle, Wash.

Mr. Witt said that Seattle had attracted great attention the country over by buying its electric railway lines and that now successful management of the railway would bring thousands of home owners from the East to reside in the city of Seattle. On the purchasing of the public utility, Mr. Witt said:

I don't know how you feel about the public utility you purchased a few years ago, I don't know what your thoughts are now, but I have vision enough to know how you will feel in the future. The world knows now that you are big enough, great enough and have the courage to own your great utility. Your one aim should be to make it the best and finest system of municipal transportation in the United States.

His topic was municipal ownership, the history of which he reviewed, saying that it was an old established institution but still going forward.

Conductors Learn to Enunciate

Minneapolis street car conductors no longer may mutter and mumble the names of streets for their own distress and the passengers' mystification. Street names, if the course in the street name pronunciation of the Minneapolis Street Railway is successful, will not be mere trippings of the tongue. They will be nothing less than street names.

From now on the passenger may read a paper with peace of mind, instead of interrupting the report of the Disarmament Conference with a jerking look at the signpost of each corner. He will read with the confidence that at his block he will be informed in intelligible English that this street is River Road.

In Minneapolis the conductors are going to school to learn pronunciation, and soon there will be no need for Esperanto there, for all Minneapolis will be speaking the English language.

The course is the latest in the school of the Minneapolis Street Railway, where for more than eight years motormen and conductors have been trained. Courtesy and how to handle an emergency are taught there, as well as the mere mechanics of running a street car and collecting fare.

Receivers Inform Public

T. H. Tutwiler and Frank S. Elgin, receivers for the Memphis (Tenn.) Street Railway, recently published in the daily papers of Memphis an interesting symposium, educative in character, entitled "The Truth."

The misuse of transfers was the subject of one article which explained very plainly the decreased revenue and unfairness to patrons produced through the wrong use of the transfer.

Another article gave a little financial history of the workings of the railway in 1920. The statement in part is as follows:

The receivers, during the year 1920, charged as a part of the Cost of Service \$280,000 to the account of Injuries and Damages. Actual Payments during the year amounted to \$353,000. It cost each revenue passenger (each time a ride was taken) over half a cent to pay the Injuries and Damages Account.

The receivers then urged the cooperation of the public in its Accident Prevention Campaign.

Utilities' Problems Discussed

Ohio Public Utility Information Committee Conducts Frank Talks Before Civic Bodies

People everywhere are anxious to hear the story of the public utilities. This is the emphatic conclusion reached by the Ohio Committee on Public Utility Information, after having operated a Speakers' Bureau for a few months on an experimental basis.

The work has now passed the experimental stage in Ohio and has become a fixed part of the Ohio committee's activities in creating good will toward public utilities and a better understanding of their problems.

SUCCESS ASSURED DESPITE MISGIVINGS

It was with some misgivings that the experimental speaking program started in Ohio. There was doubt as to the reception which might be accorded speakers who should attempt to discuss public utility matters frankly before civic organizations, but from the very beginning the work has proved an unqualified success. Not a single rebuff or discourtesy of any kind has been met with anywhere and the unanimous verdict of all organizations addressed is that what had always been considered a dull, uninteresting and technical subject had been covered in a graphic, fascinating way, replete with points of interest.

So successful was the preliminary work of the Speakers' Bureau that the Ohio committee a short time ago made arrangements for its permanent continuance and issued an attractive descriptive pamphlet outlining the service offered and giving a few of the salient facts relative to the magnitude of the public utility industry. This pamphlet has been sent to the secretaries of all civic organizations, and as a result the committee is flooded with requests from all sections of the State for speakers and engagements are booked several months ahead.

Among the subjects chosen for addresses before civic organizations are the following:

"A Half Century Miracle."

"Making Great Cities Possible."

"A Community and Its Utilities."

"The Community's Greatest Asset."

"Applying Nature to the Needs of Humanity."

"The Story of Electricity, Gas, the Street Car and Telephone."

PROMINENT SPEAKERS RETAINED

In addition to speakers of state-wide prominence in connection with the industry in either regulatory or managerial capacity, men of national reputation are being called upon for addresses in some of Ohio's larger cities. The officers of chambers of commerce, rotary clubs, Kiwanis clubs, exchange clubs and other organizations before which addresses have been made are enthusiastic in their commendation of the work and the committee has received many letters from them testifying to the undoubted good which has been done in creating a better understanding by the people of the problems of the utilities and the necessity for adjusting such problems on the basis of the square deal.

A conspicuous feature of the work in Ohio is the publicity given it by the newspapers. Not only have thousands of business men in these various or-

ganizations heard the message directly, but through the co-operation of the papers the message of the speaker has been carried to every home in the various communities.

Significant Elections in Albany District

At the election on Nov. 8 the cities of Schenectady, Troy, Cohoes and Albany, N. Y., elected complete Democratic municipal tickets, the latter city turning over politically for the first time in twenty-two years. While the strike on the lines of the United Traction Company in Albany, Troy and Cohoes, in progress since Jan. 29, was not specifically mentioned as a campaign issue by either of the dominant political parties there is no doubt that the attitude of the Albany administration under Republican rule toward the United Traction Company influenced several hundred votes against its continuance in power. In Schenectady the success of Mayor Lunn in averting a traction tie-up was openly used to his advantage.

With the four cities in the strike zone now of the same politics after Jan. 1, it is rumored that a concerted effort will be made to bring about conditions favorable to the former employees, if the company does not effect a settlement before that date.

COMPETITIVE FRANCHISE THREATENED

Another development predicted is that the incoming Democratic administration will grant franchises for increased territory to the Woodlawn Improvement Association Transportation Corporation, which now has some thirty buses in operation over established routes covering territory not reached by the United Traction Company. In this connection it is even said that the possibility exists that if the traction company by January does not discharge its present employees and re-engage those who went out on strike months ago, the new administration will grant competitive franchises covering the entire city of Albany.

There is little disposition, however, on the part of Albanians to embark in the venture so popular with Mayor Hylan of New York City of municipally owned bus lines.

Miami Votes to Operate Defunct Railway

The special election on Nov. 1 in Miami, Fla., resulted in approval by the voters of the purchase of the tracks of the defunct Miami Traction Company and the issuance of \$100,000 of city bonds for the equipment to resume operation of the line.

The Miami Beach Electric Company which operates cars to Miami Beach through a portion of Miami, has agreed to lease the city's system. Operation over the former Miami Traction Company's lines will be begun the latter part of December.

The City Commission has ordered new trolley wire, new poles and eight new trolley cars. The Miami Beach Electric Company will increase the service over present line as rapidly as traffic will permit. A ten-minute schedule is promised as soon as the fares total \$2.50 per round trip, which is the actual cost as figured by General Manager R. L. Ellis.

News Notes

Wage Cut Notice Given.—Employees of the Interstate Street Railway, Attleboro, Mass., have received notice of a proposed wage reduction, effective Jan. 1, 1922. The cut amounts to 20 per cent for car operators and 30 per cent for office employees.

Railway Announces Cut.—The Hull (Que.) Electric Railway has announced a 10 per cent reduction in wages, to become effective on Dec. 1. The new rate for senior motormen and conductors will be 43 cents an hour instead of the old 48 cents. The employees are considering the proposition.

Men Reject Cut.—Employees of the New England Investment & Security Company, which controls the Springfield Street Railway and the Worcester Consolidated Street Railway, have rejected the company's proposition for a wage reduction of 26½ per cent and an hourly basis of pay instead of the day basis.

Receiver Asked for Account.—Harry Evers, receiver for the Buffalo & Lackawanna Traction Company, Buffalo, N. Y., has been ordered by the Public Service Commission to make a report regarding what his company has done toward the cancellation of a contract with the Buffalo & Lake Erie Traction Company. The latter company is asking for an increase in fare. Mr. Evers also has been asked to submit a report of the revenue of the Buffalo & Lackawanna Traction Company for the last three months.

Will Continue to Serve.—The *News Bulletin* issued by the Ohio Committee on Public Utility Information, had its first anniversary on Nov. 7. It now starts in on its second year and promises to keep the people of Ohio informed about its electric railway, telephone, electric light properties and other conveniences. The committee, on the occasion of its first birthday, urged editors and correspondents to communicate with its bureau to secure firsthand and authentic information about the development of the utility problems in the State.

Union Appoints New Advocate.—James M. Sheehan, president of the local division of the Amalgamated Association at Albany, N. Y., in 1901, who successfully negotiated with the United Traction Company a termination of the strike in that year, has been selected to open negotiations again with the company with a view to a settlement of the strike, which has been operative since last January. This is accepted by members of the union and their friends as a virtual repudiation of Joseph S. Droogan, president of the union, as far as his ability to get successful results in parleys with the railway is concerned. So far as the railway is concerned the strike has long been over, but it has never been officially declared off by the union. That Droogan was gradually dropping out of sight as a directing factor in the Albany union was indicated in the *ELECTRIC RAILWAY JOURNAL* some time ago.

Financial and Corporate

Short-Haul Riding Popular

Number of San Diego's 5-Cent Riders Shows Largest Percentage Increase

In spite of country-wide depression, bound to affect a tourist city, the report of the San Diego (Cal.) Electric Railway for eight months ended Aug. 31, 1921, shows that the second year of the zone fare is improving on the first as regards every class of passengers except beach travel. The only kind of passengers that have decreased are the unwelcome "transfer" kind. The accompanying table will be found especially interesting because comparison is made not only with the same period of 1920, covering the first zone months, but also with the first eight months of 1919 when the 5-cent universal fare with free transfer prevailed throughout San Diego.

REVENUES RISE RAPIDLY

"Revenue from transportation," the most significant figure to the operator, rose from \$655,063 in the 1919 period to \$937,038 in the 1921 period, a gain of 43 per cent. At the same time "total cash-fare and revenue ticket passengers" rose from 13,815,120 to 14,710,835. This is a gain of 6.4 per cent although the comparison is between a flush period then and a depressed period now.

As compared with the first eight months of 1920, it will be seen that the biggest increase (5,251,806 to 5,914,825 passengers) was in the 5-cent classification. The decline from 2,841,849 to 2,706,215 passengers or about 4 $\frac{3}{4}$ per cent under "other revenue tickets" is due to the drop in long-distance pleasure riding to the beaches. The effectiveness of the San Diego zone fare in getting revenue without driving away traffic is crystallized in the fact that the average revenue per passenger, comparing 1921 with 1919 period, has risen 34 per cent.

FEWER TRANSFER PASSENGERS

Although the "total revenue passengers," including "transfer passengers," rose from 16,126,729 in the 1920 period to 17,190,570 in the 1921 period ("transfer passengers" dropped from 2,623,313 to 2,479,735 in the same periods. Other improvements of the second zone-fare period as compared with the first are the more efficient use of car-miles furnished, the number of purely revenue passengers rising from 5.61 to 6.36

passengers per car-mile. This shows, incidentally, under what thin traffic conditions San Diego must work. Another index to the better use of the transportation facilities is that the seats per passenger in 1921 were but 1.44 compared with 1.87 in the 1919 and 1.83 in the 1920 periods. In conclusion is the gratifying result that a daily deficit of \$1,067.58 in the last flat-fare period has been cut to but \$9.40 in the first eight months of the differential fare, showing that with some legitimate relief in the paving and similar burdens, the San Diego Electric Railway will be able to prosper and meet every reasonable need for service.

\$2,000,000 Additional Stock Offered Under Customer-Ownership Plan

In pursuance of its policy to enlist as partners as many as possible of its customers, and thus extend the ownership of its securities, the Public Service Corporation of New Jersey offered for sale, beginning Nov. 1, an additional issue of \$2,000,000 of its 8 per cent cumulative preferred stock, under the same partial payment customer-ownership plan which governed the recent sale of a similar issue of the same stock.

The previous offer was accepted by more than 7,400 customers within eleven weeks. The success of that campaign has confirmed the belief of the management of the corporation that many persons appreciate the advantages of closer participation in the affairs of their public utilities and realize the stability of investment in securities based upon the earning power of companies engaged in providing essential utility services to a rapidly growing and highly prosperous group of communities.

It is the desire of the corporation to extend to every user of the services furnished by it an opportunity to become a partner in the enterprise, and for that reason the terms under which the 8 per cent cumulative preferred stock is being sold have been so arranged as to make it possible for any person to acquire the stock by monthly payment of such portion of his or her savings as he or she may care to invest.

The utilities controlled by Public Service Corporation of New Jersey furnish gas, electric and railway service to a population of 2,599,489.

Consolidation Details Being Perfected

Henry L. Doherty & Company, New York, N. Y., direct the attention of the holders of the first lien 5 per cent bonds of the Consolidated Cities Light, Power & Traction Company to the consolidation recently made of important public utility properties in eastern Ohio, securities of which are deposited as collateral back of these bonds.

The Ohio Public Service Company will take over the properties in eastern Ohio which heretofore have been operated as the Alliance Gas & Power Company, the Massillon Gas & Electric Company, the Trumbull Public Service Company, the Lorain County Electric Company and the Utilities Construction Company. More than 99 per cent of the common capital stocks of the Alliance Gas & Power Company, the Massillon Gas & Electric Company and the Trumbull Public Service Company are deposited as part of the collateral back of Consolidated Cities Light, Power & Traction Company first lien bonds.

These three properties, together with the Lorain County Electric Company and the Utilities Construction Company will be consolidated under the Ohio Public Service Company, all financing of which has been completed, this financing providing for the retirement of various issues of bonds on the separate properties, the reimbursement of the treasury for expenditures made on account of additions and improvements to the properties, for the funding of current indebtedness and for other corporate purposes.

In connection with the consolidation, arrangements have been made for the retirement of the preferred stocks of the underlying companies through the exchange of the Ohio Public Service Company 7 per cent cumulative preferred stock for preferred stocks of the individual companies. The consolidation of the three companies, stocks of which are deposited as collateral back of the Consolidated Cities Light, Power & Traction Company first lien 5 per cent bonds and the addition also of two other companies, should add much strength to the position of Consolidated Cities Light, Power & Traction Company first lien bonds. Details are now being completed for the substitution of common stock of the Ohio Public Service Company for the stocks of the three companies now deposited as collateral.

Canadian Company Issues Bonds

The Manitoba Power Company, Ltd., is offering a \$3,000,000 issue of first mortgage 7 per cent sinking fund gold bonds at 90 and interest, to yield about 8 per cent. They are dated Nov. 1, 1921, and are due Nov. 1, 1941. The bonds, which are guaranteed as to principal and interest by the Winnipeg Electric Railway, will be secured by a first mortgage on the hydro-electric plant and transmission line which the company is now constructing and by collateral lien through pledge of stock of 13 miles of standard-gauge steam railroad of Winnipeg River Railway.

The net divisible income of the Winnipeg Electric Railway for the twelve months ended Aug. 31, 1921, after payment of all bond and other interest charges, was \$957,674, or over 1 $\frac{3}{4}$ times the annual interest requirements of the bonds of the Manitoba Power Company.

CHANGES IN PASSENGER REVENUE AND TRAFFIC OF SAN DIEGO ELECTRIC RAILWAY COMPARING FIRST EIGHT MONTHS OF 1919, 1920 AND 1921 RESPECTIVELY

	1919	1920	1921
Revenue from transportation.....	\$655,063	\$884,217	\$937,038
5-cent passengers.....	11,181,592	5,251,806	5,914,825
10-cent passengers.....		461,308	488,972
Other cash passengers.....		23,221	26,674
Total cash fares.....	11,181,592	5,736,336	6,430,471
7 $\frac{1}{2}$ -cent revenue tickets.....		5,326,232	5,574,149
Other revenue tickets.....	2,633,528	2,841,849	2,706,215
Total cash fare and revenue ticket passengers.....	13,815,120	13,903,416	14,710,835
Transfer passengers.....	2,279,535	2,623,313	2,479,735
Car-miles operated.....	2,389,184	2,468,693	2,312,631
Car-miles per car-hour.....	9.42	9.37	9.20
Cash and revenue ticket passengers per car-mile.....	5.78	5.61	6.36
Seats per passenger.....	1.87	1.83	1.44
Average net deficit per day.....	\$1,067.58	\$383.45	\$9.40

Public Service Corrects Erroneous Deductions Drawn from Its September Report

John L. O'Toole, assistant to Thomas N. McCarter, president of the Public Service Corporation of New Jersey, Newark, has issued a statement correcting erroneous deductions drawn from the report of the Public Service Railway for September as made to the Board of Public Utility Commissioners. Because the operating statement filed by the company for the month of September, 1921, shows a balance of \$9,175 over actual operating expenditures, fixed charges and depreciation, while a similar report for September, 1920, showed a deficit of \$104,495, the claim was advanced that the rate of a 7-cent fare with a 2-cent transfer charge recently fixed by the Public Utility Commission has been vindicated, and credit is given to that rate for having converted a deficit into a surplus.

According to Mr. O'Toole just the reverse of this is true. In the first place there was a considerable saving in pay rolls in September, 1921, over the same month of 1920 and in addition there was a decrease of \$114,000 in the expenditure for maintenance of equipment for September 1921, over the similar month a year ago. Mr. O'Toole says:

The report shows, as published, that the 7 and 2 rate produced \$2,077,707 of passenger revenue last month, which was \$141,000 less than the 7 and 1 rate produced during the corresponding month last year. There was some diminution in traffic due to industrial conditions, but allowing for this, had it not been that a saving was effected in payrolls last month the report would have shown a large deficit.

In addition to effecting a saving in payrolls the company had to cut its garment according to its cloth, in other ways. It had accumulated such a large deficit during the last three years that it simply could not go on adding to it and was compelled to forego certain work because it didn't have the money to pay for it, with the result that the figures show an apparent profit.

But a perusal of the figures filed with the Utility Board for September will disclose facts that change the aspect of the situation. It would show, for instance, that in September, 1920, there was spent \$240,-

852 on maintenance of equipment, while last month this item of expenditure was held down to \$126,360, a difference of \$114,000 in this account alone, or more than enough to offset the "turnover" from a former loss to what seems to be a present profit. Other instances could be cited of what look like savings, but are really reductions in expenditures, due to deferred maintenance, such as track reconstruction and street paving.

6,015,151 Eight-Cent Fares Collected in Eleven Days

In accordance with the decision of Federal Judges Rellstab and Woolley granting the Public Service Railway, Newark, N. J., a basic fare of 8 cents the company has filed in the United States District Court at Trenton a statement showing returns from the increased fare from Oct. 20 to Oct. 31. The new fares became effective on Oct. 20. The company is required to file monthly statements hereafter with the court.

The report shows that the total number of passengers carried between Oct. 20 and Oct. 31 was 12,927,605. The number paying the base fare of 8 cents was 6,015,151. The company sold 4,446,864 tokens or tickets at the rate of four for 30 cents. It is shown that of the total number of tokens sold 4,010,048 have been turned in by passengers for fares. The number of transfers that was issued at 1 cent each was 2,169,374.

\$447,299,000 Traction Bonds in Default

According to the *Wall Street Journal* an improvement is reflected in the amount of public utility bonds now in default, the total par value being \$470,039,000 against \$494,858,000 on Nov. 25, 1920. While the list as originally published contained all classes of public utility bonds, only the traction bonds in default have been included in the accompanying table. They total \$447,299,000. Where the maturity date is given after the name of the security, it means that there is a default as to principal as well as to interest.

Cumberland Railway Transfer in Prospect

The stock of the Cumberland (Md.) Electric Railway and the Edison Electric Illuminating Company was recently bought by T. B. Finan of Cumberland and Townsend & Scott, bankers of Baltimore. About \$2,000,000 is involved in the sale of the two properties. It is the plan of the purchasers to form a new company and to consolidate the railway, power and lighting plants under one management.

The transfer awaits the approval of the Public Service Commission, which is expected before Jan. 1.

Interest Defaulted by Michigan United Railways

A bondholders' committee of the Michigan United Railways, Jackson, Mich., in a circular issued on the default of interest due on Nov. 1 on the first and refunding 5 per cent bonds of the company, promised protection to all bondholders who deposit their bonds with the committee. The statement said:

Default having occurred in the payment of interest due on Nov. 1, 1921, on the first and refunding 5 per cent bonds of the Michigan United Railways, the undersigned holders or representatives of a substantial amount of said bonds have consented to act as a committee to protect all bondholders who shall deposit their bonds with this committee. A formal agreement is being prepared.

The circular was signed by H. A. Kahler, president of the American Trust Company; Clifford Bucknam of Pynchon & Company, Marvyn Scudder of Marvyn Scudder & Company, and R. E. Smythe, president of the Gramatan National Bank.

The total mileage of the Michigan United Railways in operation is 261, single track. This mileage includes city lines in Kalamazoo, Battle Creek, Jackson and Lansing, Mich., and interurban lines between several other points. In the company's last statement the first and refunding gold 5s were shown to amount to \$9,927,000.

TABLE SHOWING ELECTRIC RAILWAY SECURITIES IN DEFAULT

Issue	Amount	Defaulted	Issue	Amount	Defaulted
Alton Granite & St. Louis Trac. 5s	\$2,500,000	February 1920	Denver Tramway Terminal 7% notes	\$2,500,000	October 1920
American Cities Co. collateral trust 6s, 1919	7,500,000	July 1919	Des Moines City Ry. ref. 5s	4,821,000	July 1921
6% notes, 1918	3,000,000	July 1918	Elgin, Aurora & Southern Trac. 5s, 1921	1,546,000	June 1919
Atlantic Ave. R. R. (Brooklyn) gen. 5s	2,241,000	October 1919	Ft. Wayne, Van Wert & Lima Trac. 5s	1,470,000	January 1920
Improvement 5s	220,000	January 1926	Hamburg Railway 1st 4s	745,000	May 1920
Atlantic City & Shore R.R. 1st 5s	950,000	December 1915	Hartford & Springfield Street Ry. 5s	600,000	July 1918
Atlantic Shore Line Ry. 1st 5s	361,000	October 1915	Indianapolis, Columbus & Eastern Trac. 5s	6,400,000	November 1919
Atlantic Shore Ry. ref. 4s	641,000	April 1915	Interborough Metropolitan, N. Y., 4 1/2s	64,286,000	April 1919
Aurora, Elgin & Chicago R.R. ref. 5s	3,079,000	January 1919	Kansas City Rys. 7% notes, 1921	7,750,000	November 1919
3-yr. 7 1/2% collateral trust notes	1,219,000	March 1919	2 year notes, 6s, 1919	1,000,000	December 1919
Brooklyn City & Newtown R.R. 5s	2,000,000	July 1919	First 5s	15,917,000	January 1920
Brooklyn Heights, 1st 5s	250,000	October 1919	Second 5s	1,000,000	January 1920
Brooklyn, Queens County & Suburban cons. 5s	2,884,000	November 1919	Second 6s	3,924,000	January 1920
1st 5s	2,500,000	July 1919	Lexington Avenue & Pavonia Ferry, N. Y., 5s	5,000,000	March 1920
Brooklyn Rapid Transit 7% notes	57,735,000	January 1919	Memphis Street Ry. 6% notes, 1920	1,250,000	November 1920
Gold 5s	7,000,000	April 1919	1-year 6% notes, 1918	200,000	November 1918
Refunding 4s	27,621,000	July 1919	Nassau Electric R. R. (Brooklyn) 1st 5s	660,000	October 1919
5% notes, 1918	505,000	January 1919	Consolidated 4s	10,347,000	July 1919
Buffalo & Lackawanna Traction 5s	1,150,000	December 1918	New Orleans Railway & Power 5s	6,118,000	May 1919
Buffalo & Lake Erie Traction 5s	7,066,000	May 1913	New York Municipal Ry. 1st 5s	57,790,000	January 1919
Butte Electric Ry. 1st 5s	700,000	March 1919	New York Railways ref. 4s	18,061,000	July 1919
Chattanooga Electric Ry. 5s, 1919	625,000	January 1919	Oakland Traction cons. 5s	2,134,000	January 1919
Chattanooga Rys. cons. 5s	2,165,000	November 1918	Ohio Electric Ry. ref. 5s	4,200,000	January 1916
Chicago Elevated Rys. 6% notes, 1919	13,601,000	July 1919	Second 5s	2,927,000	December 1918
Collateral trust 6s	7,000,000	July 1919	Pensacola Electric 7% notes, 1921	281,900	January 1921
Chicago, South Bend & Northern Indiana Ry. 5s	2,489,000	July 1918	St. Louis & Suburban Ry. gen. 5s	4,500,000	April 1921
Cincinnati & Hamilton Electric Ry. 6s, 1918	400,000	July 1918	Consolidated 5s, 1921	2,000,000	February 1921
Cincinnati, Lawrenceburg & Aurora Electric Street Ry. 5s, 1919	500,000	July 1919	Sanford & Cape Porpoise 5s	246,000	January 1916
Cleveland & Erie Ry. 1st 5s	750,000	January 1918	Second Ave. R. R. (New York) rec. cts. 6s, 1914	3,140,000	October 1914
Cleveland, Painesville & Ashtabula R. R. 5s	1,000,000	January 1917	Con. 5s	5,631,000	January 1919
Columbus, Buckeye Lake & Newark Trac. 5s	1,243,000	November 1920	South Carolina Light, Railway & Power 5s	3,497,000	May 1921
Columbus, London & Springfield Ry. 5s, 1920	500,000	October 1920	7% notes, 1921	450,000	June 1921
Columbus, Newark & Zanesville Electric Ry. 5s	1,211,000	November 1920	Southern Ohio Traction cons. 5s, 1920	1,350,000	May 1919
Columbus & Ninth Ave. R. R., N. Y., 1st 5s	3,000,000	March 1920	Southern Traction (Pittsburgh) 1st 5s	4,000,000	October 1918
Coney Island & Brooklyn R. R. cons 4s	2,150,000	July 1919	Spokane & Inland Empire R. R. ref. 5s	3,685,000	November 1919
Consolidated 4s of 1946	1,987,000	July 1919	Toledo, Fayette & Western Ry. 5s	250,000	July 1920
Corpus Christi Railway & Light Co., 5s	829,000	July 1919	Toledo & Western Ry. 1st 5s	1,250,000	July 1920
Dayton Traction 1st 5s, 1920	250,000	May 1920	Refunding 5s	500,000	July 1920
Danbury & Bethel Street Ry. ref. 5s	458,000	November 1917	Syracuse & Suburban R. R. 1st 5s	400,000	February 1921
Denver City Tramway ref. 5s	9,892,000	May 1921	United Traction (Pittsburgh) gen. 5s	4,804,000	July 1919
Denver & Northwestern Ry. 5s	496,100	November 1920	United Traction & Electric (Providence) 5s	9,000,000	March 1919
			Total bonds in default	\$447,299,000	

Grafton Line Will Soon Resume

Electric railway service at Grafton, W. Va., is to be resumed under the management of a local company to be known as the Tygarts Valley Traction Company. The decision to this effect was reached at a meeting of the Chamber of Commerce when assurance was given that a fund of \$50,000 will be raised at Grafton. The plans as arranged call for the operation of one-man cars.

First mortgage bonds in the sum of \$50,000 are to be sold in denominations of \$100, \$500 and \$1,000. These bonds will bear interest at 6 per cent. They are being offered for sale at Grafton.

Along with the bonds there will be an issue of common stock. This stock will have a par value of \$1. It will be coupled in the selling with the bonds, a \$100 bond and one share of stock costing \$101. Subscriptions to the bonds will be payable 50 per cent at once and the remaining 50 per cent on June 1.

Of the \$50,000 which will eventually be received from the bond issue, \$25,000 will become immediately available. Added to this will be \$500 secured from the sale of stock. This will give the new corporation a net capital to begin with of \$25,500. Of this amount \$16,000 will go to pay for the property of the Grafton Traction Company, bid in under foreclosure. The balance will be used in making such repairs and improvements as are absolutely necessary at the outset.

The cars will be repaired, the Blueville extension will be built, the track improved, several pieces of machinery and equipment added and the river bridge repaired and repainted. The new line will operate on at least a thirty minute schedule. The new owners are confident that the line can be made to earn all operating expenses and the interest on the bonds, with the prospect that a substantial amount will soon accumulate for distribution among the stockholders.

Bonds Authorized to Reimburse Company for Improvements

The San Diego (Cal.) Electric Railway has been authorized by the Railroad Commission to use the proceeds from the sale of \$577,000 of its 5 per cent general first lien sinking fund gold bonds to reimburse its treasury and finance in whole or in part construction expenditures incurred on or before Sept. 30 of this year. The effect of the order, it is pointed out, will be the substitution of bonds for the indebtedness incurred by current liabilities.

Originally the company asked the approval of \$970,223 for construction expenditures. The propriety of a number of items was questioned by the commission and the application was thereupon amended and the present authorization applies only to expenditures properly chargeable to capital account.

During 1920 the company sold its power plant to the San Diego Consolidated Gas & Electric Company receiving in payment \$425,000 of bonds and \$575,000 of 7 per cent preferred stock of the purchasing company. Through the sale of these securities and the use of sinking fund the railway has retired \$1,320,000 of its first mortgage bonds as of Sept. 30, 1921. The company had outstanding \$1,250,-

000 of stock and \$2,600,000 of bonds and has \$344,103 in the depreciation funds and \$596,015.33 current liabilities.

\$417,426 Loss by Toronto Railway Last Year

The annual meeting of the Toronto (Ont.) Railway was held on Sept. 30. Sir Henry M. Pellatt presided in the absence of the president, Sir William MacKenzie, who is abroad.

The following statement was presented for the year ended Aug. 30.

Gross earnings.....		\$7,909,891
Operating maintenance, etc.	\$6,626,508	
Interest on bonds.....	109,175	
Percentage earnings (city).....	1,308,339	
Pavement, taxes, etc.....	283,294	
		\$8,327,318
Deficit.....		\$417,426
Profit and Loss Account—		
Balance from previous year.....		\$5,578,527
Deficit after payment of all expenses, interest, taxes, etc.....		417,426
		\$5,161,100

The balance sheet submitted shows road and equipment carried at \$19,681,262, an increase of about \$13,000; advances to subsidiaries at \$1,341,344, a decrease of over \$100,000; accounts receivable at \$434,858, down about \$75,000, and cash on hand at \$109,087, down over \$200,000. Total assets are placed at \$21,683,174, as against \$22,572,281 the previous year.

All the retiring directors were re-elected with the exception of C. P. Beaubien, Montreal, whose place was taken by William H. Moore, general manager of the Toronto & York Radial system. Mr. Moore has been prominently identified with the MacKenzie & Mann interests for many years.

Financial News Notes

Receiver Appointed.—Walter C. Graeff was recently appointed receiver for the Ephrata & Lebanon Street Railway, operated by the Ephrata & Lebanon Traction Company, Lebanon, Pa.

Vincennes Company Reorganizes.—The Vincennes (Ind.) Electric Railway has been incorporated, with capital of \$100,000, as the successor under reorganization to the Vincennes Traction Company.

Wants to Discontinue Service.—The Geneva, Seneca Falls & Auburn Railroad, Seneca Falls, N. Y., has petitioned the Public Service Commission for permission to abandon a portion of its line in Seneca Falls. The railway's claim is that the operation of this line is unprofitable.

\$149,395 Added to Boston Deficit.—The month of September added \$149,395 to the deficit of the Boston (Mass.) Elevated Railway, which now totals \$342,422, as revenue failed to meet expenses by that amount. Total revenue as compared with a year ago is decreasing about 7 per cent.

Wants to Abandon Line.—The Reading Transit & Light Company, Reading, Pa., notified the court on Nov. 1 that it wishes to abandon that portion of

its line in Norristown on DeKalb Street from Brown Street to the borough line, a distance of 2,200 ft. Unprofitable operation was given as the reason for the suspension.

Wants to End Railway Service.—The Muskegon Traction & Light Company, Muskegon, Mich., has announced that it will seek permission from the State Utilities Commission to discontinue railway service on Nov. 20. The company has been operating in competition with jitneys and has lost considerable money. Recently it appealed to the City Commission for financial assistance.

Receivers for Utilities Win a Victory.—Receivers for the Memphis Gas & Electric Company and the Memphis (Tenn.) Street Railway have won a temporary victory at least in their fight against the State Tax Commission for a lower assessment, for on Oct. 28 Judge A. B. Neil, of the Second Circuit Court in Nashville, granted the receivers writs of certiorari and super-seas against the State board.

Make Valuation for Rate Fixing.—The Indiana Public Service Commission has placed a valuation of \$4,346,653 on the property of the Indiana Railways & Light Company, Kokomo, for rate-making purposes. A ten-year average of prices from 1911 to 1920 was used by the commission in figuring the value of the property. Non-utility property owned by the company, valued at \$172,585, was not included in the valuation.

O'Connell Interests Extend Holdings.—Thomas E. O'Connell, president of the Phoenixville, Valley Forge & Strafford Electric Railway, Phoenixville, Pa., has purchased the Montgomery & Chester Electric Railway property from the Philadelphia Suburban Gas & Electric Company for \$200,000. The old board of directors has resigned and a new one has been elected, with Mr. O'Connell as president; Thomas E. O'Connell, Jr., secretary, and A. J. Taylor, treasurer. Other directors are J. Gerald O'Connell, J. Fred O'Connell, V. N. Shaffer and Dr. W. K. Williams.

Valuation Hearing Started.—Proceedings for ascertainment of valuation of properties of the Altoona & Logan Valley Traction Company, Altoona, Pa., and Home Electric & Steam Heating Company, were begun on Nov. 10 before Public Service Commissioner W. D. B. Ainey. C. L. S. Tingley submitted figures. The reproduction cost of the traction system was given as \$7,017,542, as of Dec. 31, 1919, with an average for five years from 1914 to 1919 of \$5,328,560, while the electric and heating plant value was put at \$823,304, as of Dec. 31, 1919.

Change in Control Contemplated.—Negotiations are under way for the absorption of the American Cities Company by the Electric Bond & Share Company. Collateral trust 5 and 6 per cent bonds of the American Cities Company outstanding to the amount of \$7,709,000 have been in default of interest since July 1, 1919. They are secured by deposit of a majority of the stocks of subsidiary companies which include the following: Birmingham Railway Light & Power Company, Houston Lighting & Power Company, Knoxville Railway & Light Company, Little Rock Railway & Electric Company, Memphis Street Railway and New Orleans Railway & Light Company.

Traffic and Transportation

Five-Cent Fare Ordered

Connecticut Company Required to Reduce Charges Within City Limits of Bridgeport.

Under an order issued on Nov. 16 the Connecticut Company is directed by the Public Utilities Commission to put into effect in the city of Bridgeport, Conn., a 5-cent fare without transfer, on all its lines radiating from the center of the city to various specified points at the city limits. In the opinion of the commission additional jitney routes are not required at the present time in Bridgeport. The new fare is to continue for a trial period of ninety days and is to go into effect on Nov. 20.

Salient features of the commission's order are:

On cars terminating in or passing through the center of the city, passengers may ride across said neutral zone without the payment of an additional fare.

The rate of fare from the center of the city and points along the line to points beyond the city limits, but within the present fare limit, is to be 10 cents.

No transfers are to be issued or accepted within the city limits.

The order is not to apply to other lines and sections of the Connecticut Company not herein specially referred to.

The 5-cent fare previously described is to be put into effect on or before Nov. 20, 1921, and to remain in effect for a test period of ninety days thereafter and until further order of the commission.

The Connecticut Company is directed to keep a careful separate account of the riding and revenues of the city of Bridgeport, of the riding revenues and as far as possible of the operating and other expenses of the present Bridgeport, Norwalk and Stamford divisions, subject to inspection by the commission.

PETITION FILED OCT. 11

The petition on which the commission made its findings and rulings was filed by the city of Bridgeport on Oct. 11. It represented:

1. That the conditions for the conveyance and transportation of passengers in Bridgeport are such as to make the present rate of fare charged by the Connecticut Company unreasonable and prejudicial to the public welfare and necessity.

2. That public necessity and convenience require the reduction of the rate of fare charged by the Connecticut Company for transportation within the limits of Bridgeport from 10 cents to 5 cents, or to such other rate of fare as shall be reasonable.

3. That conditions affecting transportation within the city of Bridgeport make it reasonable and proper that a hearing upon an application to reduce the fares should be held in Bridgeport.

In the finding the commission says:

Large centers of population should assist in supporting tributary lines having to do with the social, business and industrial activities of the community, but should not be called upon to assist in the maintenance of street railway service in remote sections of the state. Upon the request and advice of the commission, the respondent company has submitted a tentative plan for dividing its system into territories for accounting districts, which has not been approved by the commission. Each such district should be self-supporting and allow the company a fair return on the value and equipment, and any revenues in excess of such fair return should inure to the benefit of the public of that district in the form of improved service or reduced rates.

The commission also gives this opinion:

It is doubtful under present economic conditions if a 5-cent flat rate can be successfully maintained on any portion of the company's system but we are of the opinion that the maximum 10-cent fare for short rides in population centers is not

at present the economic fare for such daily riders and is not producing as much revenue as a lower fare with increased patronage would produce.

The probable financial advantage of a lower fare is not so much from the carrying of a large number of passenger during the peak hours of the day as carrying a materially larger number of short haul passengers during the lean hours of the day. We are not satisfied that 5 cents without a transfer is the economic rate for short haul city travel, but the elimination of the transfer and the establishing of such fare on all lines radiating from the center of the city to the city limits is not equivalent to reducing the revenues 50 per cent based on the present limited number of passengers riding at a 10-cent fare through longer zones.

The success or failure of a 5-cent fare in Bridgeport will depend largely upon the attitude of the city and the amount of patronage which the riding public will afford the railway, and also upon such additional economies as the company may be able to introduce, including the use of one-man cars as far as reasonably practical.

It might be extremely dangerous to the financial interest of the company to experiment with a 5-cent fare in a city where the company is now receiving a fair amount of patronage, but in a city where the present patronage under a 10-cent fare is so limited that the revenues fall short of paying the actual operating expenses an experiment with a 5-cent fare in populous centers, without transfer and with contracted fare limits, ought not to result in serious financial loss to the company. A careful analysis may demonstrate the necessity of abandoning certain lines and substituting some other form of transportation at rates that will afford a reasonable return for such substitute transportation.

The commission believes that railway service in Bridgeport is an absolute necessity, irrespective of the large number of jitneys and the extent of their operation. The principal demand for increased number of jitneys is largely due to the difference in fares.

Considering the whole situation, the commission concludes that public necessity and convenience do not require additional jitney operation in the city of Bridgeport or additional jitney operation for the city, or upon any suburban or interurban routes applied for.

The hearing at which the petition for a reduction in fare was held at Bridgeport on November 10.

COUNSEL PROTESTS CHANGE

D. G. Watrous, counsel for the Connecticut Company, told the commission at the hearing on Nov. 10 that the federal trustees would do their best to give service at a 5-cent fare if the commission made such an order for Bridgeport, but pointed out that because of the fiduciary relations existing between the trustees and the company, the trustees could not agree to it. Mr. Watrous did not intimate, however, that the trustees would resign in the event that a reduction in fare was ordered.

That the attitude of the federal trustees has not changed since Judge Noyes imparted to the commission the information that the company would be in a better position to act on a reduction next spring was made evident by Mr. Watrous. He made the following claims:

1. That the trustees were convinced that a fare reduction at this time would upset the unity of the single fare idea for the entire system.

2. That a 5-cent fare trial should not be made in Bridgeport.

3. That it would be utterly impossible to operate the road on a 5-cent basis either as a test or otherwise.

L. S. Storrs, president of the Connecticut Company, also spoke for the company at the hearing and explained a situation which has arisen recently in Pittsfield, Mass., where a zone system with a 6-cent fare had not worked satisfactorily. As a result the public demanded a return to the flat 10-cent fare basis. Mr. Storrs spoke along the same lines as Mr. Watrous.

Those seeking a return of the 5-cent fare took comfort at the hearing on Nov. 10 in the recommendation which Chairman Higgins, speaking for the commission, made to the trustees of the Connecticut Company on Oct. 11. That recommendation follows:

The 10-cent fare does not bring the necessary revenue. If the company can't manage to supply service in Bridgeport without a continuing loss, there is only one alternative. I would suggest as an experiment or test for a limited period of time the adoption of a 5-cent fare without transfer on all city lines radiating from the center of the city.

This might necessitate a change of the outer zone point on certain lines. The revenues and expenses of such an operation in the city of Bridgeport division should be kept separate from other divisions and be considered in connection with the cost and maintenance of the Bridgeport division.

Such an experiment could not put the company in a condition much worse than now exists, and in the absence of some prompt action or relief in Bridgeport, the commission will feel obliged in the interests of the public to authorize additional jitney routes and grant additional certificates.

WANT TRANSFERS

Although the commission has recommended a 5-cent fare without transfers, interests which were understood to represent the jitneymen objected to a system of lines radiating from the center of the city on the ground that the city's workers would still have to pay a 10-cent fare as they lived in one part of the city and worked in another part of the city. City Attorney Comley and Representative Kilpatrick asked for a return of the present flat 5-cent fare basis.

Jacob B. Klein, counsel for the jitneymen of Bridgeport, said a 5-cent fare with no transfers would mean nothing to the workers of the city and urged the commission to grant additional jitney permits. Representatives of the Chamber of Commerce and other business organizations approved of the 5-cent no-transfer scheme.

Louisville Watching Youngstown Experiment

James P. Barnes, president of the Louisville (Ky.) Railway, has been watching with interest the plan adopted in Racine some time ago, and just recently in Youngstown, under which the railways in those cities issue weekly tickets which allow unlimited riding. Mr. Barnes said in part:

If it is possible to put the system in operation here, so as to give cheaper fares to the majority of the people and at the same time run no risk of our revenue falling off, we would be glad to try the system. However, it is too early to make a definite statement about it. We are watching the Youngstown experiment with great interest and are in constant touch with the situation and shall soon have some definite information.

Louisville is a much larger city than Youngstown, and we do not know whether a city of twice the size can operate under the plan as economically and as successfully in making the unit fare the same. Before trying it out we will gather actual facts and figures over a period of time long enough to determine the answer to these problems.

No Traffic Increase Probable With Reduced Fare

Public officials at Hartford, Conn., are wondering what effect a reduction in fares to 5 cents on lines of the Hartford division of the Connecticut Company will have on the number of passengers carried. Figures obtained from the company's headquarters at New Haven show that in September, 1916, a 5-cent fare was collected from 4,003,758 passengers. At that time industrial activity was at a peak in Hartford and the number of persons riding was consequently enlarged. In Sept. 1921, a 10-cent fare was collected from 3,366,930 passengers, a decrease of 636,828 for the month. The daily average for Sept., 1921, was 112,231, or 21,227 less than the daily average for Sept., 1916.

The operating expense of the Hartford division in Sept., 1916, was \$123,609, which increased fully 120 per cent to \$271,744 for the same month in 1921. On the other hand, the revenue increased only 68 per cent, from the \$200,187 of Sept., 1916.

Under these conditions, to receive its present revenue, for which it is contending, the company will have to carry at a 5-cent fare 3,366,930 more passengers, than it did in 1920, but even at the peak period in 1916 and under a 5-cent fare the company carried only 636,828 more for September than at present.

Thus a return to the original 5-cent fare would provide only one-fifth of the increase needed to produce the present revenue.

Mayor Newton G. Brainard of Hartford, one of the federal trustees of the Connecticut Company, said that the decreased traffic on the Hartford division is a direct reflection of the decreased industrial activity in the city. He thinks that a reduced fare would not attract many more passengers, but feels that Hartford is entitled to the smaller rate if the Public Utilities Commission is to follow that policy in other cities.

Ten Cents Authorized in Helena

The State Railroad Commission recently authorized the Helena Light & Railway Company, Helena, Mont., to establish a 10-cent fare. The order provides for tickets at 6½ cents.

The present fare is 8 cents, with tickets at 5 cents. This charge, the company claimed in renewing its application for increased rates, failed to bring the revenues up to the expenses.

In its finding the commission criticized the service rendered by the railway and said that more efficient service would be expected in the future in consequence of granting the company's demands. Reference to the petition of the company was made in the *ELECTRIC RAILWAY JOURNAL*, issue of Sept. 24.

Seven-Cent Fare Extended

The Missouri Public Service Commission at Jefferson City recently extended the 7-cent fare now in effect on the lines of the United Railways of St. Louis until June 30, 1922. The order states that the added period will expire on that date and the fare will revert to the rate of May 31, 1918, which was 5 cents.

The commission is now hearing evidence to assist its placing the valuation on the property of the United

Railways and when this valuation is completed the rate of fare will be determined. The company will have the right, when the commission orders the lower fare, to ask for a higher rate.

Boston Not Returning to Five-Cent Fare

Notwithstanding repeated explanations, says the *Boston News Bureau*, there still exists a misconception of the Boston Elevated Railway's 5-cent fare policy. The extension of the 5-cent service to include more and more outlying communities does not presage a return to the nickel unit on the rapid transit system. The single idea is to enlarge the sphere of usefulness of the elevated system. Halving of the fare in suburban districts has not multiplied the number of passengers; in fact, the elevated management aimed at only a 100 per cent increase in order that introduction of the lower fare might not cut into the revenues of the system as a whole. As a matter of fact, the company is getting about a 75 per cent increase in riding traceable to the 5-cent fare, which is considered satisfactory in view of the depression in industry and rediscovery of the lost art of pedestrianism.

Safety First Educational Campaign Via the Public Schools

All the public schools of San Francisco, Cal., in which there are enrolled a total of about 100,000 school children, are being visited seriatim by a lecturer who is showing moving pictures and telling stories with a "safety first" moral which have a bearing particularly on street traffic in cities. The lecturer's time for the 60-day period that will be required to cover all the schools is being paid on a fifty-fifty basis by the San Francisco Municipal Street Railway and the Market Street Railway. The moving pictures are supplied gratis by the Firestone Tire Company and the Ford Motor Company.

The street railways have found this method of promulgating the safety first idea most effective because by this means it is possible to gain access to the home circle. In other words, the children are missionaries through whom it is possible to reach adults who have become so accustomed to the usual safety first literature and other ordinary educational measures that these are passed by without heed.

Bus Line Into Boston Begins Operation

The Norfolk & Bristol bus line began operation on Nov. 9. These buses give residents of the Hyde Park district transportation service into Boston, Mass., for 15 cents. Service is given over four lines from Cleary Square.

Bus operation in this section grew out of the recent controversy with the Eastern Massachusetts Street Railway over a 20-cent charge to Boston.

Residents of Hyde Park boycotted the cars of the Eastern Massachusetts Street Railway and when Mayor Peters was unable to effect a compromise a permit was granted to the Norfolk & Bristol bus line with the assurance that the rate of fare would be 15 cents. Reference has been made previously in the *ELECTRIC RAILWAY JOURNAL* both to the boycott and the bus permit.

Fare Increase to Stand Pending Final Determination

The 8-cent fare recently granted to the Public Service Railway for its lines in New Jersey stands, pending the final determination of the appeal that has been filed with the U. S. Supreme Court.

This court on Nov. 14 denied the motion of the New Jersey Public Utilities Commission for a stay against the 8-cent fare. The court has had the motion under consideration since it was made on Nov. 14 by Attorney General McCran and L. Edward Herrmann, counsel of the utilities board. The denial of the motion was announced by Chief Justice Taft.

The United States District Court for New Jersey held the rate of fare fixed by the commission confiscatory, and permitted the company to increase fares, but required it, under bond, to redeem rebate slips issued to passengers should the decision be reversed or modified.

The State Commissioners sought to have the old rates continue until the Supreme Court disposed of the case, the company objecting on the ground that it could not be secured against loss which it would suffer if old rates were charged and the increase allowed by the lower courts finally should be approved by the Supreme Court.

Ticket Sale Is Ordered Resumed

By a recent order of the Public Service Commission the New York State Railways must resume the sale of tickets on cars on the city line in Syracuse. The commissioners hold that failure to offer tickets or tokens for sale on cars at 7½ cents is a public inconvenience. The cash fare is 8 cents.

This is the first point won by the city in its fight before the commission for the restoration of ticket sales, termination of one-man car service and a reduction in fares.

Chicago Fare Case Closed

The fare case of the Chicago Surface Lines is now in the hands of the Illinois Commerce Commission for decision, closing arguments having been presented on Nov. 14 and 15 by attorneys for the city and the companies. The companies have been collecting an 8-cent fare since July, 1920, and the city is insisting that they be held to the ordinance rate of 5 cents.

Rate cases of the elevated roads, the gas and the telephone companies were also set for hearing during the week ended Nov. 19. These cases are somewhat different because action was started by the commission instead of by the city.

Further hearings on the question of subway construction in Chicago have been held before the local transportation committee of the City Council. Citizens were invited to present their views.

The city comptroller reported that the companies have paid into the traction fund since 1907 the sum of \$22,411,528. Investment of this fund in Chicago city bonds, tax warrants and liberty bonds has added \$5,414,132 in interest. There is also due about \$3,000,000 additional which the companies have tendered but which the city refused to accept for fear that this would be an acknowledgment of the validity of the ordinances.

"Pep" Put in Public Policy Promises

Winnipeg Company Carries Its Message of Service Direct to All Its Patrons

"Service" is the slogan adopted by the Winnipeg (Man.) Electric Railway for its new campaign to win the good will of the public. The purpose, as stated by A. W. McLimont, the vice-president, is to impress upon the public "that we desire to give service to the end that they may prefer to buy what we have to sell—car rides, gas, light and power; and, second, to impress upon our employees that in mutual interest it is necessary that the best type of service be rendered by every one working for this company."

The campaign opened with the Oct. 15 issue of the *Winnipeg Electric Public Service News*, the company's house-organ, with an article "Why We Are Out to Give Service." This publication was distributed to the public through "Take One" boxes in the cars

A circular, here reproduced, was inclosed in each pay envelope on Nov. 1, entitled "Stop, Look and Listen."

The company feels the "Better Service" campaign already has brought good results where the public is concerned and that the employees have given excellent co-operation.

U. S. Supreme Court Upholds Seattle's Right of Regulation

The Supreme Court of the United States on Nov. 9 upheld the right of the city of Seattle, Wash., to oust the jitneys from the city streets. All of the state courts had already upheld the city's right, but the jitney interests took an appeal to the United States Court. The city of Seattle has been battling the jitney for five years. Estimates have placed the loss sustained by the municipal railway there from the jitney as high as \$350,000 a year. The entire controversy was reviewed at length in the *ELECTRIC RAILWAY JOURNAL* for Oct. 1, 1921, page 571.

clause which specifically states that the buses shall be subject to the existing ordinances of the city, and Corporation Counsel Walter F. Meier has issued an opinion that the certificate of convenience and necessity granted by the State Board of Public Works did not supersede an existing city ordinance to regulate service within the city.

In support of this opinion, a statement has been made by E. V. Kuykendall, director of the State Board of Public Works, to the effect that the city of Seattle has sole authority in regulating jitney service.

The board holds that it has no jurisdiction over city streets and is unable to fix routes or termini of stage lines within the city limits. The Department of Public Works was compelled to grant the certificate, according to Director Kuykendall, because of the uncontroverted showing that the Sound Transit Company had been in legitimate operation between Roosevelt Heights and Seattle on and prior to Jan. 15 last.

Federal Court Will Not Judge in St. Paul Case

The Federal Court having refused to interfere at present in the St. Paul (Minn.) City Railway rate case the way was left open for hearing before Judge F. M. Catlin on Nov. 15 in the Ramsey County District Court of the appeal of the company from an order by Judge J. C. Michael of the same court restraining the company from collection of an emergency rate of 7 cents, an increase of 1 cent, granted by the Minnesota Railroad Commission.

Judges W. H. Sanborn, W. F. Booth and T. C. Munger of the Federal court in their decision on the appeal of the St. Paul City Railway of Nov. 3 for an order restraining the city from interfering with the collecting a flat rate of 7 cents per ride held that although the court has jurisdiction in the case it should not interfere until the state court of concurrent jurisdiction has completed its adjudication or shows lack of prompt diligence in reaching its decision. The appeal to the Federal court was on the basis that the present rate of 6 cents did not permit the company to make a due return on its investment, in effect confiscation of the property.

Pierce Butler in speaking for the company made the points that the case argued in Federal Court is not the same as that in the Ramsey court, because it deals with the 6-cent fare that is in existence, while the state case relates to the 7-cent fare ordered by the Railroad and Warehouse Commission; that no contract was entered into to appeal only to the state courts, as the city contends; that the section of the Brooks-Coleman act, which gave the Railroad and Warehouse Commission rate control, requiring a complete new trial is unconstitutional in that it gives to the court legislative authority; that the judge in the Ramsey County District Court exceeded his authority when in addition to granting a restraining order, he also in effect set the rate of fare by prohibiting collection of a fare at a rate higher than that existing.

The Federal judges ruled as follows:

However, this suit will not be dismissed. This court has jurisdiction of the suit, and the court will stay its hand and await the action of the court of Ramsey County until such time as it has completed its duties or until such time as it appears necessary in the discretion of this court that action should be taken and that it can take action without violating the rules heretofore stated.

STOP

- ☞ "Running By" intending passengers, or leaving them at transfer points. Why lose revenue that way?
- ☞ Discourtesy to our patrons and obtain their goodwill to the end that they may prefer to use the services we sell in our electric railway, gas, and electric light and power departments.
- ☞ Wastefulness of time or materials—make every hour you are paid for give value to the organization and we will all benefit.
- ☞ Careless practices wherever you see them and do your part towards realizing our "Safety First" ideal.

LOOK

- ☞ For leaves on the track, or for "greasy rail" if you are a motorman, and operate carefully.
- ☞ For defects in equipment or materials. Report the defects and thus prevent accidents and loss.
- ☞ After the ventilation of the car in your charge, if you are a conductor, and thus please and satisfy your patrons.
- ☞ For passengers at car stops and transfer points, and for new customers for our gas and electric departments.
- ☞ For opportunities to improve the service and let us have your suggestions.

LISTEN

- ☞ Carefully to requests from passengers or customers and comply with them if consistent. Remember we are all salesmen—selling the products, car rides, gas, light and power, we manufacture—and we must have the goodwill of our customers if we are to succeed in our business.

ADVICE TO EMPLOYEES OF WINNIPEG COMPANY CONTAINED IN ATTRACTIVE CIRCULAR

and sent to nearly 1,000 citizens. In it was this statement:

We want the people of Winnipeg to know that we are their servants, that we are in business to satisfy their utility wants, and to please them. We want to give Service, first, last and all the time. That is the policy which underlies our whole activities.

But we also believe that the best service can only be obtained by the fullest measure of co-operation on the part of those we are serving. We don't think that any utility service can be entirely satisfactory until the public and the operating company realize they must work together.

Criticism and suggestions from the public have been invited that would help the company to give greater satisfaction. By following the suggestions whenever possible the company has proved its sincerity.

Customers will receive with their November electric and gas bills cards headed "We Are On Our Toes to Serve You," and through regular issues of the *Winnipeg Electric Public Service News*, the public will be informed of the service campaign.

Without the co-operation of the employees the officials realized that their efforts would fail. Each employee received instructions in a letter how to extend courtesies characteristic of the department. On the street car, in the office of the company, in the homes during the reading of the gas meter, the employees are expected to give the utmost service.

A further development in the jitney situation is the resumption of operations by the jitneys owned by the Sound Transit Company, under a certificate of necessity issued by the State Board of Public Works at Olympia permitting the company to operate stages from Roosevelt Heights in the Cowen Park District into the business section.

Armed with a legal opinion from Corporation Counsel Walter F. Meier to the effect that the jitneys were being unlawfully operated, Superintendent of Public Utilities Carl H. Reeves, ordered their operations stopped. The company again resumed operations when a temporary restraining order was issued by Judge Brinker in the Superior Court, giving the jitneys operating to Roosevelt Heights protection until Nov. 14.

W. R. Crawford, representing the jitney interests, alleges that the company had made proper application for a certificate of necessity, specifying the termini of the proposed stage route, and a schedule of tariffs, and that the certificate was duly granted by the State Department of Public Works at Olympia; that the jitneys commenced operation under this authority, and that one driver was subsequently arrested and the other 26 drivers operating were threatened with arrest.

The city legal department takes the stand that the certificate of necessity granted to the jitney drivers contains a

Railway Rejects City Proposition

The St. Johns Electric Company, operating street railway service in St. Augustine, Fla., and St. Johns county, also, including a line to Anastasia beach, has refused the city's offer of \$20,000 for its Matanzas River bridge, because of the city's requirement that rent be paid for crossing the bridge and service maintained right along. The company has countered with a proposition.

It offers the bridge for \$21,000 provided the city and county allow the company to traverse the bridge free of rent, and agree to abrogate that portion of the franchise requiring the company to maintain service along certain routes. Abrogation of this section would permit the company to withdraw from the street railway field in St. Augustine, which is something the city and county is trying to prevent.

Many other concessions besides the payment of \$100 a month by the company for the use of the bridge were included in the city's proposition.

Regulative Bus Ordinance Invalid

A Muncie (Ind.) ordinance, passed in September, forbidding jitney buses from operating in Muncie on streets used by street cars, has been declared invalid by William A. McClelland, judge of the city court, on the ground that the object of the ordinance was to protect the Union Traction Company. The court said that if the city has power to enforce an ordinance of this kind, it would have equal power to say that no hacks could operate for hire on any streets of the city, and that, although the right of the city to regulate traffic is admitted, prohibition is not regulation. It is understood the traction company will appeal.

Six Cents Lowest Rate in Large Canadian Cities

According to the *Monetary Times* of Toronto, Canadian public utility companies will now have their day as rate reductions will come more slowly than falling costs, and while their losses during the war were stupendous, their improved status is seen from the advanced rates of fare which have been authorized. Cities listed by that paper follow:

Ten-cent fares: Regina, Calgary, Saskatoon, Sherbrooke, Sydney, N. S., North Cobalt, Lewis, St. John.

Seven-cent fares: Montreal, Toronto, Winnipeg, Edmonton, Fort William, Port Arthur, Brandon, Peterboro, Quebec, Halifax, Guelph, Haileybury, New Glasgow.

Six-cent fares: Sarnia, Moose Jaw, Vancouver, Victoria, New Westminster, North Vancouver.

It is noticed in the above summary that 6 cents is the lowest fare rate in the large cities of Canada.

Small Road Turns to Gasoline Car

The Indiana Truck Corporation, Marion, Ind., has constructed a gasoline street car for the Gallipolis & Northern Traction Company, Gallipolis, Ohio. The new car is built on the lines of the regular Indiana truck, with the 40-hp. motor enclosed in the regulation truck hood. The motors and bodies will be built in Marion. The car makes a speed of from 25 to 30 m.p.h. and has four speeds forward and four in reverse. The car has three brakes,

an emergency, a service brake and the "pony truck" brake. The builders claim it will make 10 miles on a gallon of gasoline. Four wheels are on the "pony truck" which carries the front part of the car, and there are two wheels in the rear. All are flanged to run on the street railway tracks. The car is of the pay-as-you-enter variety and will comfortably seat thirty persons.

City Council Will Pass on Bus Routes

By a recent vote of the City Council of Decatur, Ill., bus routes will be regulated by the City Council and not by the Illinois Commerce Commission.

Bus operation has become very active in the city of Decatur and bus owners wanted the Council to approve of routes designated by the commission and had asked the Council to pass a resolution giving its approval to whatever routes the commission chose.

No action will be taken by the Council until it has an opportunity to go over the various routes that have been submitted. At a recent meeting of the Council Mayor Borchers said that the future growth of the city demanded careful consideration of all methods of transportation and that every one would be given a respectful hearing on his petition.

Connecticut Company Analyzes \$1,352,918 Profit

The startlingly high income of more than \$1,000,000 announced for the Connecticut Company by President L. S. Storrs recently has made it one of the leaders among electric railways which are recuperating from the period of depression. The details for the first seven months of 1921 as compared with the same period for 1920 are as follows:

	1920	1921
Total operating revenue.....	\$8,359,760	\$9,588,807
Total operating expenses.....	8,178,330	7,832,105
Net operating revenue.....	\$181,430	\$1,756,702
Taxes.....	457,369	409,230
Operating income.....	*\$275,939	\$1,347,472
Total non-operating income..	9,025	5,447
Net income available for return on capital invested.....	*\$266,914	\$1,352,919

* Deficit.

Taxes were reduced by the State Legislature to 3 per cent of the gross revenue, and operating expenses have declined by \$346,225. A further saving will follow the wage reduction of 8½ per cent which was made by the wage arbitrators, retroactive to June 1. By this decision the maximum wage for motormen and conductors was reduced from 60 cents to 55 cents.

As indicated in the *ELECTRIC RAILWAY JOURNAL* for Oct. 29, page 798, the increased income of the company is due to a 10-cent fare and to the liberal policy followed by the State Legislature. Among the measures passed were those regulating jitneys by a Public Utilities Commission and granting electric railways the right to operate buses, those exempting the electric railways from obligations to bear cost of new bridges except for the cost of strengthening those used by the trolleys and those exempting the companies from paying for maintenance and construction of paving except for 8 in. on either side of each rail.

Transportation News Notes

Gives Sanction to Operation of Buses.—The Board of Public Utility Commissioners has granted authority to the Camden, Marlton and Medford Bus Company to operate five buses between Camden and Medford, via Marlton.

One-Man Cars in Use.—The Trenton & Mercer County Traction Corporation is now using exclusively one-man type cars on all the lines in the city of Trenton, N. J. With the arrival of five new one-man cars all the cars of the larger type have been placed on the suburban lines.

Wants Reduced Fares.—The Emporia (Kan.) City Commission has requested the Kansas Electric Utilities Commission to reduce its rate of fare from 10 cents to 5 cents. The City Commissioners last year authorized the higher fare because of the high cost of operation.

Fares Jump.—The Columbia Electric Street Railway, Light & Company, Columbia, S. C., recently increased its rates from 7 to 10 cents between the Fair Grounds and the city and at the same time put into effect a 3-cent charge for transfers for passengers coming into the city.

Filed Applications to Be Considered.—The Public Utilities Commission of Washington, D. C., will hold a hearing this month on four motor bus applications. The principal request is from the Washington Rapid Transit Company, which is seeking to establish a route across town from Union Station to 3rd and O Streets.

Civility and Courtesy Reign in Akron.—The Northern Ohio Traction & Light Company, Akron, Ohio, was so infected with the "courtesy" disease last month that it appears it will remain in the system for at least another month. The company continues to receive congratulatory messages on the courteous acts of its trainmen. The effort is to make "Civility as universal in Akron as the transfer."

Syracuse Against One-Man Cars.—An ordinance has been adopted by the City Council of Syracuse, N. Y., making illegal the operation of one-man cars in Syracuse after Dec. 1. Edmund H. Lewis, Corporation counsel, has announced that injunction proceedings will be taken by the city if the New York State Railways, operating the local lines in Syracuse, persists in using one-man cars after the date fixed for their discontinuance.

Traffic Signs Installed.—Stationary ornamental traffic signs have been placed on the downtown business streets of Dallas, Tex., to safeguard pedestrians in boarding or alighting from street cars. These stationary signs are made from concrete, heavy enough to withstand any ordinary shock, and display red and green lights at night. They are large enough to be seen by any motorist and are placed at the ends of the safety zones. Motormen of the Dallas Railway have been instructed to stop their cars so that patrons in alighting or boarding will be behind and protected by these traffic signs.

Personal Mention

Toronto's Management

Task of Rehabilitating Municipal Property in Hands of Messrs. Couzens and Harvey

A bold sign is now being displayed all over the city of Toronto and has become as familiar as were during the war the route signs displayed in battle-scared villages of the war zone. It reads something like this, "Temporary change of route owing to the urgent necessity of renewing the tracks on — Street. Cars will be temporarily rerouted as follows: . . ." Even the main thoroughfares of Toronto for several miles have been closed to traffic for about three weeks. People take a little longer getting to work and getting home. Changes in routes unless closely followed are puzzling to the citizens and entirely confusing to the visitor. But it is all borne cheerfully, for in every part of the city there is evidence of the vigorous pushing ahead of the rehabilitation of Toronto's broken down transportation system.

This big experiment in public ownership was placed above and beyond municipal politics when the Toronto Transportation Commission was named, consisting of T. W. Ellis, chairman, a manufacturing jeweler; George Wright, a hotel proprietor, and Fred Miller, a construction engineer, but the real planning and execution of this work is being done by two very able railway men. These are H. H. Couzens, general manager, and D. W. Harvey, assistant manager, whose duties commenced on Sept. 1 when the commission took over the operation of the street railway system from the Toronto Railway. Mr. Couzens, who is also general manager of the Toronto Hydro Electric System, was given an indefinite leave of absence last year to accept this position as general manager for the commission. The expectation is that he will be general manager of both. For the most part the old department heads have remained with the commission in their former capacities.

Mr. Couzens is indeed fortunate in having behind him a wealth of experience, most of which was obtained in England, as an asset invaluable to him in pushing forward this complete reorganization and reconstruction to a successful consummation. The latest developments of the industry are being utilized in the form of safety cars, buses, and trailers, each in its proper sphere, while the greater part of the old rolling stock has been made the subject of advertisements to ensnare the unwary operators of other street railways. It is understood also that trackless trolley lines are to be built if it is shown that they will fit into the general scheme as the most economical solution.

It is not surprising that the people are satisfied to wait perhaps two or perhaps three years for an adequate transportation system when they see everywhere before them concrete evidence of the determination of the com-



H. H. COUZENS

mission management to push the work ahead just as fast as their resources will permit. Mr. Couzens has seen to it that months before the system was taken over new steel had been ordered, construction machinery purchased, engineers employed, and material gathered in large dumps. On the very day that it was taken over gangs of men started to work not in one section, but in many, tearing up old tracks, reballasting and laying new. Everything had been thought out ahead. The vigor of the whole thing was an object lesson in itself.

Mr. Couzens is a native of England. He was born in Totnes, Devonshire, England, in 1877. After receiving his education at the Independent College at Taunton, England, he subsequently served as a pupil in both mechanical and electrical engineering with Allen & Sons, Taunton, and the Taunton Corporation Electrical Works, respectively. In 1898 he was appointed assistant engineer of the Bristol Corporation Electrical Department, in Bristol, England, and held that position until 1901, when he was appointed deputy chief electrical engineer of Bristol. He resigned in 1909 on his appointment as manager and engineer



D. W. HARVEY.

of the West Ham Corporation Electric Supplies, and in 1912 was appointed to a similar position with the Hampstead Borough Council, and continued for a year as consulting engineer for West Ham. He resigned that position at the end of 1912 on his appointment as general manager of the Toronto Hydro Electric system and took up the duties of this position early in 1913. As previously stated, Mr. Couzens will probably continue in this capacity in spite of the arduous duties connected with his appointment as general manager of the municipal property in Toronto.

Mr. Harvey, the assistant manager of the commission, was previously superintendent and engineer of the Toronto Civic Railway. Mr. Harvey was with the Toronto Civic Railway when operation first began in 1911, at which time he was given charge of construction. In 1912 the operation and maintenance were also placed under his supervision.

Mr. Harvey was born in London, Ontario, on Feb. 24, 1887. After graduating from the Toronto University he was with the Ontario Power Company and subsequently was connected with the Toronto Structural Steel Company.

Leaves Holding Company

S. E. Wolff, of Hodenpyl, Hardy & Company, Becomes Executive in Food Products Corporation

S. E. Wolff, who for many years has been identified with Hodenpyl, Hardy & Company, Inc., New York, in the management of public utility properties, is retiring from his present connection to become vice-president of the United States Food Products Corporation.

Mr. Wolff is a Western man. He was born and educated in Michigan where he spent his earlier business life in the operation of public utility and railroad properties. In 1903 he became general manager of the Jackson (Mich.) Gas Company (now owned by the Michigan Light Company), and two years later became vice-president, and also vice-president and general manager of the gas, electric light and power and city traction properties in Saginaw and Bay City and the interurban road connecting these cities.

In 1908, he removed to New York City and was engaged in the executive offices of Hodenpyl, Walbridge & Company, principally in examination and reports on properties and the reorganization of working forces of such properties as were acquired. He remained with Hodenpyl, Walbridge & Company until 1911 when it was succeeded by Hodenpyl, Hardy & Company for whom he has been constantly engaged in examinations of organizations of working forces and management of corporations, principally public utilities but embracing also railroad, manufacturing and mining properties.

During the past six years Mr. Wolff has had general supervision of purchases of the Hodenpyl, Hardy & Company properties which include the Consumers Power Company, Michigan Light Company, Central Illinois Light Company, Southern Indiana Gas & Electric Company, the Northern Ohio Traction & Light Company, etc., and in the course of these duties it has been necessary to visit many manufacturing plants with a view of ascertaining their

ability to produce apparatus, supplies, etc., and of inquiring into their facilities and organizations. Incident to the foregoing he has given particular attention to valuations of properties and the economics and engineering involved in the presentation of rate cases.

In 1917 he entered the army and was assigned to the Signal Corps and later to the Bureau of Aircraft Production where he served as the head of the Finance Division. On his discharge from the army he resumed his duties with Hodenpyl, Hardy & Company, Inc., and the properties under their management with which he has been associated until his recent election to the vice-presidency of the United States Food Products Corporation.

He is a member of the leading trade and technical associations and has done important committee work as well as filled various offices in organizations.

Lionel Drew, formerly connected with the Savannah (Ga.) Electric Company, a Stone & Webster property, has gone to Guatemala where he has accepted a position with the American International Company.

Alderman R. Mayne, deputy Lord Mayor of Newcastle-on-Tyne and chairman of the Newcastle Tramways Committee, was elected president of the Municipal Tramway Association of Great Britain at the recent annual meeting at Manchester.

P. E. Glenn, who has been acting secretary of the Oklahoma Corporation Commission for the past year, has assumed the duties of accountant for the commission following the appointment by the commission of G. F. Smith of the Oklahoma City Chamber of Commerce, as permanent secretary. Mr. Glenn was employed by the commission as accountant but was serving in both positions temporarily until the commission saw fit to appoint a permanent secretary. Mr. Glenn has served with the commission almost continuously since 1910, and is one of the most valuable employees of that body.

Obituary

William E. Baker, a well-known civil and electrical engineer who retired from active engineering practice some years ago, died suddenly on Nov. 1 at his home in New York. He was born in Springfield, Mass., sixty-five years ago. After completing his technical education at Lafayette College he entered railroad service, later becoming largely instrumental in breaking the westward trail for the Canadian Pacific. He was chief engineer of the International & Great Northern Railway from 1884 to 1888. After several years spent with the Thomson-Houston Electric Company, Mr. Baker was in Boston from 1892 to 1894 in charge of the electrification of the West End Street Railway system. Several years later he was general superintendent of the West Side Elevated Road of Chicago and subsequently came to New York as general superintendent and chief electrical engineer of the Manhattan Elevated Railway. Later, Mr. Baker opened an office in New York and was consulting and constructing engineer for several electric roads, including the Scioto Valley Traction Company, Columbus, Ohio.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE
MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

Business Improvement

Department of Commerce Survey Indicates Increased Production in Representative Industries

That there is a real basis for the general statement of improved business already issued by the Department of Commerce is revealed by the detailed departmental survey for October. This publication, the third number of *The Survey of Current Business*, shows the trend of all important industrial movements at the first of October. A careful study of the figures presented shows that, considered as a whole, business and industry have moved forward. In the majority of industries production and consumption increased and stocks declined. Iron and steel showed a steady gain. The building industry indicated improvement. Textile consumption figures continued to advance and exports of raw cotton were substantially larger than a year ago. The unemployment problem, while still far from disposed of, showed a decided change for the better.

Taking up several important industries and treating them separately, the survey said that the iron and steel industry evidenced a slight improvement in production during September, with pig iron 2.7 per cent greater than in August and steel ingots 1.9 per cent greater. Exports and imports of iron and steel increased, by 24.2 and 35.1 per cent, respectively. An increase in unfilled steel orders marked the turning point in a long decline. Orders for bolts continued to increase, but for nuts and rivets the demand, as shown by new and unfilled orders, declined. Bar iron shipments increased slightly.

Copper production turned upward, with a slight increase in August. An increased foreign demand is noted for this metal, with September exports 44.1 per cent larger than August and, with one exception, the largest monthly shipment since May, 1920.

Zinc production continued to decline, but at a descending ratio; the September decline was only 2 per cent. Stocks declined 6.1 per cent. The decline in stocks of tin was arrested at a level 53 per cent below the previous September. There was an increase in imports, September being 13 per cent larger than August. During September, steel prices declined slightly, but in iron, copper, lead, tin and zinc, increases of from 1 to 6 per cent occurred.

Building costs continue to decline. As measured by the Aberthaw Construction Companies' index for concrete factory buildings, the September cost declined 1.9 per cent, while the *Engineering News-Record* shows a further drop of 2.7 per cent compared with August. The latter index is based on the cost of steel, lumber, cement and common labor. Cement production was the largest on record for September, and new records of shipments were established for the quarter and the first nine months of the year. Stocks of cement at the mills were drawn upon to supply the demand during Septem-

ber, as is customary in the season of active demand, and declined 16.2 per cent from August.

In the field of railroad transportation good progress was made in reducing the number of idle freight cars during September with a decrease of 30 per cent, box car surplus declining 39.3 per cent and coal cars 24.9 per cent. At the end of September, car surplus had been reduced 65 per cent from the peak last March. Shortage of freight cars increased but the total shortage is still very small. Total car loadings increased 4 per cent in September, especially merchandise loadings, and are the largest since November, 1920.

Prices of Malleables Unsteady

As in the other branches of the iron and steel industry the manufacturers of malleable fittings are operating only on part time and quite a wide range in price quotations can be had. One New England foundry which turns out guy clamps, insulator pins and other miscellaneous small castings is operating from two to three days a week. Very few large orders are being placed and competition is keen. Price cutting is much in evidence and some manufacturers declare that prices have been quoted in a number of instances which cover only the bare cost of material and labor without any allowance for overhead cost or profit.

From the high mark two years ago of 36 cents a pound for small malleable castings the price has dropped to around 13 to 14 cents a pound at the present time. Some quotations as low as 8 to 10 cents have been reported. For the larger castings the price ranges from 8 to 11 cents per pound. Malleable prices at Pittsburgh have held steady around \$20.50 per ton for the past month. However, slight changes would have little effect on finished castings and there is little to indicate that finished prices will change for some time.

Manufacturers state that many users of malleable castings have large stocks on hand which were purchased a year or so ago and these stocks must be consumed before any considerable activity can be expected.

Westinghouse Company Buys Seattle Plant

Negotiations leading up to the establishment in Seattle by the Westinghouse Electric & Manufacturing Company of a manufacturing and assembling plant were consummated a short time ago when this company purchased the plant of the Kilbourne & Clark Manufacturing Company of Seattle for a reported consideration of \$130,000. The plant will be used for the assembling and testing of machinery, manufacturing switch-boards and instrument panels, warehousing of the company's products and the housing of its sales organization. Seattle is the principal distributing center for the Westinghouse products in the Northwest.

Carbon Brush Demand for Maintenance Needs

Deliveries Are Prompt Though Production Is Still on a Sub-Normal Basis

Manufacturers of carbon brushes quite uniformly report a quiet market for their product so far this fall. With industrial operation at its present low point in almost all lines of activity throughout the country fewer motors are being run and consequently there is not the normal demand for brush replacements. On the other hand, in certain lines of industry it has been possible to take advantage of the opportunity offered by these times of slack production to overhaul electrical equipment, and in those quarters the demand for replacement brushes has held up for the past few months fairly well. Electric railways are not endeavoring to carry surplus stocks, and their buying has continued on a hand-to-mouth basis.

There are many signs, however, of better business ahead. It is stated in several quarters that the carbon brush business is continuously showing an improvement, an indication that a state of normalcy in this line is slowly but surely approaching. Producers naturally are proceeding cautiously on the supposition that the next few months will not bring forth any startling increase in demands. At the present time production is averaging around 65 per cent of capacity while inventories have been brought down to a corresponding level.

Stocks of the semi-finished products are in ample shape to fill customers' current demand and all manufacturers are able to make very prompt shipments. Prices are no longer at their peak, most manufacturers having made reductions in their prices in amounts varying from 10 to 20 per cent. Other manufacturers are still quoting on the same price basis that they have been for the past few years. This was the case when prices were not raised to correspond with peak production costs that existed during this time.

Seven Bids on Queensboro Subway Extension

The New York Transit Commission received seven bids on the construction of certain subway extensions to the Queensboro subway from Grand Central Station to Forty-first Street and Eighth Avenue. The extension will give substantial relief to the congested area of the Interborough shuttle operated in Forty-second Street and will materially improve the service of the Queensboro subway. This extension is regarded as one of the most important remaining links of the dual system to be constructed.

The bids received are: Powers-Kennedy Construction Corporation, 149 Broadway, \$3,839,000; Keystone State Construction Corporation, 17 West 42nd Street, \$3,895,000; F. L. Cranford, Inc., 149 Remsen Street, Brooklyn, \$4,171,000; Patrick McGovern, Inc., 50 East 42nd Street, \$4,235,000; Booth & Flynn, Ltd., \$4,389,000; Rogers & Haggerty, 125th Street and Park Avenue, \$4,800,000 and J. A. Gillespie Co., 7 Dey Street, which stated its bid would be approximately \$5,000,000.

The plan for this extension calls for a two-track subway beginning at a lower level underneath the existing shuttle tracks, near Vanderbilt, ex-

tending west under Forty-second Street to a point in West Forty-second Street, a short distance east of Sixth Avenue where the line bends south under Bryant Park into Sixth Avenue and thence turns west into Forty-first Street and continues along that thoroughfare to a terminal joint just west of Eighth Avenue. Stations on the new line will be two in number, one at Fifth Avenue and Forty-second Street and the second beneath the Times Square station of the Interborough west side subway.

One reason given by the Transit Commission for constructing the line as far as Eighth Avenue is that eventually it will connect with a new subway through the latter thoroughfare, which, it is believed, will be the first to be built when new work begins.

Copper Demand Widespread

The amount of copper available at 13½ cents a pound delivered for November and December shipment is becoming quite small, as most producers are holding at 13½ and some are entirely out of the market.

Consumption is showing improvement, and one large manufacturer of copper and brass goods says that he doubts whether the proportion of copper recently bought and used for building up stocks in consumers' hands is nearly as large as many are inclined to think. Demand for copper goods is today much better than for brass products, but the brass business has improved considerably during recent weeks.

The amount of scrap brass on the American market is becoming quite small, and this will tend to help raise the price of copper during the next few months. One consumer, however, does not expect any large increase in the copper price to result but rather a healthy and sustained moderate increase, while another says that his company has increased stocks of metal on hand greatly in the last few months.

Rolling Stock

Danbury & Bethel Street Railway, Danbury, Conn., will be in the market for four safety cars provided the receiver, J. Moss Ives, receives the permission from the Superior Court, to which he has petitioned.

Staten Island (N. Y.) Midland Railway has purchased from the Second Avenue Railroad New York forty of the 100 double-truck one-man cars which the latter company remodeled from open cars as was described in the Feb. 19, 1921, issue of the *ELECTRIC RAILWAY JOURNAL*.

Pennsylvania-Ohio Electric Co., Youngstown, Ohio, has ordered seventeen one-man safety cars, twelve of which are to be used in giving additional service on the Youngstown Municipal Railway which is a subsidiary company. With the arrival of these cars the number of this type of car used by the company will be increased to sixty-one.

Recent Incorporations

Norwood Street Railway, Birmingham, Ala., has been incorporated with a capital stock of \$2,000. The purpose of the new corporation is to acquire, maintain and operate a railway in the city of Birmingham.

Vincennes (Ind.) Electric Railway has been incorporated with capital of \$100,000, as successor under reorganization to the Vincennes Traction Company. G. H. Armstrong, J. H. Powers and E. C. Theobald are the incorporators.

Plaza Railway, Charlotte, N. C., has been incorporated with a capital stock of \$50,000.

The incorporators are H. B. Heath, D. H. Johnston and C. E. Barnhardt. The new company will resume the service on Central Avenue and along the Plaza which was abandoned some years ago.

Track and Roadway

Chattanooga (Tenn.) Traction Company expects to extend its Red Bank line a distance of about 12 miles along the Dayton highway.

Cape Girardeau-Jackson Interurban Railway, Cape Girardeau, Mo., will rebuild the line at a cost of \$50,000. New tracks and new equipment will be purchased.

Cincinnati (Ohio) Traction Company, will place new rails on Vine Street from Mulberry to McMillan Streets. The estimate submitted by the company to W. J. Kueztz, director of street railroads, is \$58,000.

Cincinnati, Ohio. An initiated ordinance to extend the East End line of the Cincinnati (Ohio) Traction Company to California was overwhelmingly defeated at the municipal election held here on Nov. 8. This was the second time the amendment was defeated by the voters.

Northwestern Ohio Railway & Power Company, Toledo, Ohio, will reballast about 5 miles of track. This ballast will not be put in under the ties until next spring, but can be purchased and distributed much more economically now than during seasons of heavy traffic.

San Diego (Cal.) Electric Railway has completed that part of the reconstruction of the double track and paving between Third and State Streets on Broadway which was begun the latter part of September.

Youngstown (Ohio) Municipal Railway, a subsidiary of the Pennsylvania-Ohio Electric Company, recently completed construction of 2½ miles of double track on one of its principal lines in Youngstown. The rails, with thermit welded joints, are laid on steel ties, embedded in concrete.

Little Rock Railway & Electric Company, Little Rock, Ark., has been urged to build a connecting line through the western portion of the city to provide service for residents of the district between Prospect Avenue and the route of the Highland lines. It is estimated that this proposed line would cost approximately \$90,000.

Trade Notes

Westinghouse Electric & Manufacturing Company has announced the following changes in its service department: B. B. Burkett has been appointed district service manager in the Seattle office, succeeding N. P. Wilson, who has been transferred to sales service activities on switchboards and similar apparatus in the Seattle territory. The Salt Lake service department has been made a branch of the Denver office, under the direction of A. F. MacCallum, district service manager, Denver. M. R. Davis, formerly district service manager at Salt Lake, will remain at Salt Lake and devote his time to field service work and to securing repair business for both ships.

Fred B. Uhrig, for the past forty years an employee of the Western Electric Company has retired from active service. Fred Uhrig joined the Western Electric Company as an office boy in Chicago in 1881. The spirit of application and sincerity of purpose which have marked his whole life showed themselves even then, and promotion came rapidly. By 1883 he had become editor and service man, and in 1895, credit man of the Chicago office. When the Denver branch was opened in January, 1903, Mr. Uhrig was chosen as its manager. The following year he went to Kansas City as manager of the distributing branch there, and later became also western district manager. He contributed more than any other man to the development of his company's business in the southwest between the Mississippi and the Rockies.

New Advertising Literature

David W. Onan, 43 Royalston Avenue, Minneapolis, is distributing a leaflet describing the "Onan" lathe and mica under-cutter.

Texas Company, New York, made "Diesel Engines" the subject about which the leading article was published in a recent issue of *Lubrication*.