

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

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Number 16

He Is from Missouri and Wants to Be Shown

THE favorite slogan of Missourians is supposed to be "Show me." There is a Kansas City in Missouri and another city of the same name across the Kaw River in Kansas. The Kansas City Railways Company operates street cars in both localities. On the Missouri side the company has been permitted to charge a 6-cent fare, but no such relief has been given on the other side of the river. As a result the employees in Missouri have been getting higher wages than their fellows on the Kansas lines. Recently the company undertook to suspend service on one of the Kansas lines in order to make up a deficit. The Kansas Public Utilities Commission promptly directed that the service be restored. President Kealy—as announced in the Oct. 5 issue of the *ELECTRIC RAILWAY JOURNAL*—has sent a letter to the Mayor of Kansas City, Kan., in which he offers to surrender to that city complete control of the local electric railway system in return for a guarantee of 6 per cent interest on the capital invested. He also agrees to help the city authorities remove any legal barrier which may be found to stand in the way of taking over the lines. Can the Kansas authorities ask for a more open-handed offer? What an opportunity is here offered to take over a going concern on a fair basis and furnish service at cost! Surely the rate of return mentioned by President Kealy is not excessive. The Kansas Mayor has a splendid chance to show what kind of service can be given for 5 cents. If his people are behind him they should grasp at this offer and undertake to prove that electric railway managers do not know what they are talking about. Perhaps they can retain enough surplus out of the nickel fare after paying all expenses to reduce the municipal debt. Truly this is too good an opportunity to be passed up.

Colonel Kealy standing on the Missouri side of the Kaw might well say "Show me." Crossing over the river he bids the people to "Let George do it."

Why Should Wages Be the Same Where Conditions Are Different?

PRESIDENT KEALY and his associates in the management of the Kansas City Railways Company are to be commended also for making a strong defense in their case before the National War Labor Board. Ever since the first batch of awards was made by this body fixing wage scales beyond the financial ability of many of the employing companies, there has been a general feeling of despair in the industry. This was aggravated when the higher authorities announced that nothing would be done by the federal government in the way of providing means to meet these new burdens of expense. Some relief has been given here and there by local authorities to take care of individual cases, but there are still numerous companies facing the conditions brought about by the Labor Board's decision which have not been given a helping hand. Far from despairing at the outcome of the first cases handled by this board, President Kealy has set about to prove that the practically uniform wage rate announced for other cities would not be fair in the Kansas City case. First, he went before the board with an agreement signed by the management and the organized employees providing that any advance in the wage rate should be limited by the financial ability of the company to pay. Evidence has been presented since that time to prove that the company would be in a distressing financial condition if any substantial wage increase were given to the employees.

It has been argued in the Kansas City case that general figures on increased cost of living do not show the facts as far as this situation is concerned. Careful studies were made as to costs of food, rentals, etc., in Kansas City. Accurate information was presented on actual living conditions among the employees. An interesting point brought to light is the fact that the average family of the company employee consists of 3.4 persons. Cost of living has usually been figured on the basis of five persons to a family. While this par-

AMERICAN ELECTRIC RAILWAY ASSOCIATION

N. Y. Conference Program

Meeting to be convened at
UNITED ENGINEERING SOCIETIES' BLDG.
29 West Thirty-ninth Street
at 9.30 a.m.

Friday, November 1

MORNING SESSION—

Address by President John J. Stanley
Report of Electric Railway War
Board

Topical Discussion:

*The Needs of the Interurban
Electric Railway*

AFTERNOON SESSION—

Topical Discussion:

*As Follows: — Light - Weight
Cars, Zone System, Higher
Unit Fare, Public Subsidies,
Public Ownership*

The discussion on each topic will be introduced by the presentation of a ten-minute paper prepared by a man of wide reputation in the electric railway field.

ticular showing may have little weight with the Labor Board, it emphasizes the fact that generally accepted bases sometimes are unfair in specific cases.

Significant Program Will Confront New York Conference

THE conference of electric railway men which is to take the place of the annual convention of the American Electric Railway Association will find itself face to face with momentous problems—problems more momentous than have ever before been confronted in this industry. The meeting should bring together the best leadership in the electric railway field. The circumstances are such that very definite progress should result. The five topics listed for the afternoon session indicate the high spots in electric railway management at the moment. They range from physical equipment to broad economic principles. These topics have been carefully selected in the expectation that their discussion will lead to some formulation of the procedure which must be followed if electric railways are to survive and serve. The general public as well as the personnel of the industry will be vitally interested in the outcome of the conference.

Tuning Up the Snow-Fighting Equipment

A MATEUR weather prophets are predicting a mild winter, a condition which will be greatly appreciated by transportation and way departments if it materializes. Squirrels are said to be laying up a lighter supply of nuts than usual, and farmers are reported to have found the corn husks quite thin this fall. Reliable as these omens may be for the farmer, they cannot be depended upon for the electric railway operator; hence, the very considerable activity in getting snow-fighting paraphernalia into shape which is manifest in railway shops everywhere. In comments upon the subject of preparedness in this matter, in the issue of this paper for Aug. 31, four requisites of a successful snow-fighting campaign were listed; namely, equipment, organization, *esprit de corps* and alertness. Equipment is placed first because the best of organizations is badly handicapped unless the proper tools have been provided. The problem in preparing the equipment is to anticipate local conditions on the basis of past experience so that all reasonable demands can be met. In addition to the standard plows and sweepers, excellent progress has been made in some quarters in fitting up work cars and other cars with light plows and scrapers. A number of such have been described in recent issues of this paper.

From the master mechanic's standpoint the special demands in the way of emergency equipment afford the most interesting problems. An example is the ice-cutting device constructed from a plow and from sweeper fittings, made and used at Schenectady and described elsewhere in this issue. A still more simple but very effective ice cutter was rigged up overnight at Rochester last winter. It consists of a knife slightly longer than the track gage, mounted on a stout angle iron attached rigidly to the truck frame of a single-track car in such a position as to clear the rail tops by 2 in. or so. When

this car is weighted down and is propelled, with the assistance of a four-motor car, over ice-clogged track, the ice is sheared off clearly and effectively. Undoubtedly many such plans have been tried out successfully. This paper will be pleased to print accounts of any practicable scheme, knowledge of which will contribute to snow-fighting preparedness.

The wisdom of investing a few thousands of dollars in providing and preparing equipment for snow fighting by way of insurance is obvious when one considers how unnecessarily expensive, in dollars and public irritation, may be a few hours of preventable tie-up. It ought to be easy to get the general manager's "O. K." on a requisition for this purpose by reminding him of what happened last winter.

The "Good" Is Often The Enemy of the "Best"

THERE is many a slip 'twixt cup and lip. When the Mayor of St. Louis last April signed the United Railways resettlement ordinance, which had been approved by the Municipal Assembly by a vote of twenty-eight to one, and when President McCulloch characterized the proposed ordinance as a not ideal but "fairly good solution of a difficult problem" and expressed the hope that it would be accepted as a compromise by both parties, the way for final adoption seemed clear. But now, as noted elsewhere this week, Mr. McCulloch, well within the year allowed for acceptance, has rejected the ordinance. Why? Conditions have changed materially in the last few months, and it is now evident that the company's financial structure cannot be permanently adjusted under the proposed plan. But other objections strike directly at some of its fundamental principles.

In the first place, Mr. McCulloch declares that the ordinance is defective in the light of present standards because it does not make it easy or convenient for the public to assume operation or ownership of the property. The plan was to give the city the right, after the expiration of ten years or any five-year period thereafter, to purchase the property. This is not an unheard of provision; wherein should it cause dissatisfaction? The answer is found in Mr. McCulloch's clearly expressed distrust of commission regulation as a successful means of assuring proper service to the public and a fair return to investors in a period of crisis. Regulation has failed, he seems to feel, and the city should not be estopped by a formal, widely spaced schedule from trying to secure relief in its own way if the public should happen so to desire.

But—and this is the second point—if the public wishes to have service-at-cost operation under private ownership, then the plan should provide for good service at a minimum cost. With regulation as a system under suspicion, however, no faith is maintained that such a result can be obtained with the proposed 5-cent fare, changeable if and when the local commission has jurisdiction. In Mr. McCulloch's opinion, it can be secured only through a public "guarantee" of operating expenses, taxes, provision for future replacements and a fair return. Does this refer to a legal guarantee that the community's taxing power will be exercised to make up deficits in annual net income, as in the case in Boston

until the revenues have made up the deficiency, or does it refer simply to the practical guarantee afforded by a flexible fare capable of prompt and automatic adjustment? The latter appears to be the case, because of possible constitutional restrictions on the former and because, in speaking of the proposed ordinance when it was passed, Mr. McCulloch deprecated its lack of a leading feature of an "ideal" ordinance—"a flexible fare which may be adjusted automatically from time to time so as to guarantee always good service, fair wages and a sure return upon the investment."

In short, the St. Louis resettlement plan is deficient in the very fundamentals in which it should be the strongest; it lacks a maximum of flexibility to provide what the company needs in the way of revenue or what the public wills in the way of control. In rejecting the ordinance the company is not fighting against the city's interests; it is simply asking the city to give full expression to modern far-sighted principles in laying a basis for dealing with future citizens, car riders and investors. In view of the long franchise negotiations in St. Louis, a compromise measure may a few months ago have seemed wise, but the company is right in now declaring that the ends to be gained are worthy of further effort.

The Evolution of the Track Switch

AN AUTOMATIC track switch is one of the easiest things in the world to design on paper and one of the most difficult to bring to a commercially successful status. The urgent necessity for something of the sort, however, has furnished an active stimulus to inventor and manufacturer, so that now several good devices are available. The present and prospective labor shortage, together with the need for all practicable devices which will assist in increasing the schedule speed of cars makes the track switch particularly interesting at this time. For this reason we arranged with R. C. Cram, of the Brooklyn Rapid Transit Company, to make a comprehensive survey of the subject, and the results of his study are given in an article in the present issue. To provide space for this and on account of general space limitations the publication of the next articles in the series on power transmission and choice of car equipment respectively will be deferred until November.

To return to the problem of designing a track switch that will operate in a reliable manner let us first attempt to realize what the designer is up against. His chief enemy is the weather, which has the ability to impose mechanical and electrical obstacles in his way. Devices which would be entirely reliable on a car or in a sub-station cannot be depended upon out of doors. The electric solenoid and plunger or the electric motor can supply all of the mechanical force needed for pushing over a switch tongue provided that current supply is available and ample and that no serious obstructions interfere with the motion of the tongue. But there's the rub, how shall good electric circuit continuity combined with freedom of tongue movement be obtained? How the difficulties have been overcome and the modern track switch evolved is taken up in Mr. Cram's article.

Another feature of switch operation is, of course, that of positive locking. To obtain this is not difficult if the other requirements are met.

Are Unreasonably Low Fares Confiscatory?

ARE the federal courts destined to be the final resort for fare relief? A brief news item in our issue of Sept. 28 told of a decision of Judge English in the Federal Court granting a permanent injunction restraining the Illinois authorities from interfering with the Illinois Traction System in the proposed increased passenger rates above 2 cents a mile with 3 cents as the maximum that can be charged. On page 676 of the issue for last week it was announced that another federal judge has taken up the application of the Grand Rapids, Grand Haven & Muskegon Railway designed to prevent enforcement of the Michigan 2-cent fare law.

The Illinois situation is especially interesting because of the tangle in the rate situation brought about by the court's ruling. An Illinois statute has for several years fixed a limit of 2 cents per mile on passenger hauls. The Public Utilities Commission of the State has frequently held that it is powerless to allow charges above that maximum. Before the federal government took over the operation of steam roads the courts had also refused to grant a higher rate to such carriers in Illinois. With the inauguration of federal rule, the passenger rate for the steam roads was fixed at 3 cents per mile.

This, however, did not apply to electric lines within the State. The decision of Judge English apparently paves the way for other electric roads to secure a 3-cent rate within the State. However, in the case of the Illinois Traction System which operates across the river into Missouri the company encounters the ruling of the Interstate Commerce Commission that not more than 2½ cents per mile shall be charged. This tangle is further complicated in the case of the Alton, Granite & St. Louis Traction Company where the State limit of 2 cents per mile still applies and the I. C. C. maximum is met at the State line. This company has an appeal for a 3-cent rate pending in one of the State courts.

Here we find the Illinois Traction System with federal court authority to charge as high as 3 cents per mile within the State. To put that rate into effect in conjunction with the 2½-cent tariff for interstate hauls might be attacked as discriminatory. Apparently the only way in which full benefit can be had from Judge English's ruling is for the Interstate Commerce Commission to allow a similar rate for trips across the river into Missouri.

It is to be hoped that the Interstate Commerce Commission will have the broad vision of Judge English, who held that "complainants herein are subject to the same operating conditions and expenses as exist on steam lines of railroads now under federal control and that the service performed by the complainants compares favorably and is in competition with such railroads under federal control."

If State commissions or State courts are powerless or unwilling to untangle such situations as the above, we must look to the federal tribunals to clear up such palpable cases of confiscatory laws. Perhaps this latest form of remedy for inadequate rates is the solution for the troubles of the electric railways. Some drastic remedy seems necessary.



A Study of the Development and Present Status of Automatic and Remote-Control Track Switches, with Consideration of the Factors Which Have Contributed to Their Evolution

THE traffic requirements of street railway car operation upon lines having very close headways necessitate the employment of some means for turning the switches in order to minimize delays at junction points. With car schedules under which the cars do not reach a closer spacing interval than three minutes it is possible for the motorman to turn the switch by hand with his switch iron, without causing undue delays to following cars, but where the interval is less than three minutes it becomes necessary to employ a switchman. But the cost for this amounts to \$1,000 or more per year for each switch, and it was the desire to cut

average of the four costs reported, of \$65 per year per switch. It is believed that \$100 will closely approximate the maintenance cost, exclusive of interest for these mechanisms on any road where there is a traffic which requires an average of not less than 500 movements per switch per day. It is to be noted that the electric apparatus is available for operation all of the time, while the use of switchmen is mainly confined to from six to eighteen hours per day.

The first attempts to produce such devices were solely along mechanical lines and the Patent Office undoubtedly has many recorded patents for mechanical devices in

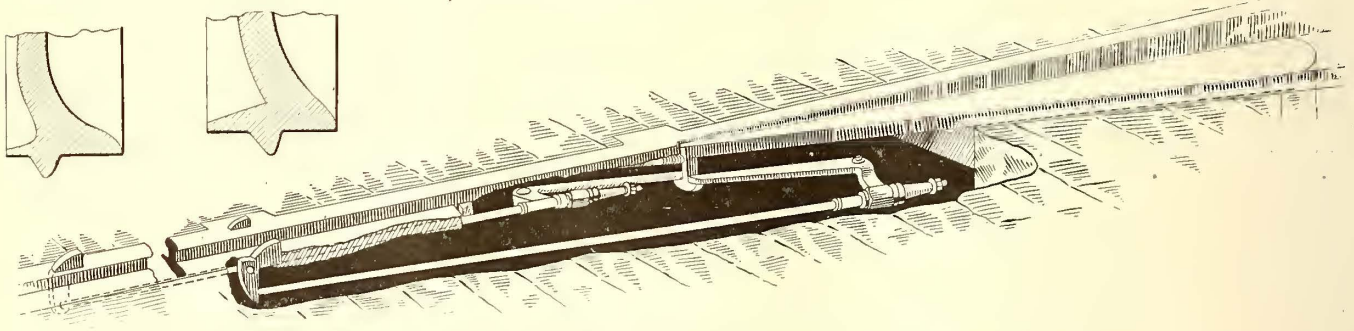


FIG. 1—EARLY MECHANICAL FORM OF TRACK SWITCH USED IN NEW YORK CITY

down this operating expense which led to the employment of mechanical and electrical devices as substitutes. The introduction of various forms of prepayment and center-entrance cars, which impose door-opening and closing duties upon the motorman and render his constant presence upon the car desirable, is another factor which in recent years has contributed to the quite general adoption of switching devices.

There is no question as to the fact that the installation of electric track switching mechanisms will result in an operating economy at any location where traffic conditions warrant the employment of a switchman only in the rush hours, say for a total period of six hours per day. This saving effected is indicated in the accompanying Table I.

The operating costs used in the table are believed to be very conservative. A recent questionnaire in *Aera* developed a range in maintenance costs for electric switching devices of from \$35 to \$100 per year, with an

average of the four costs reported, of \$65 per year per switch. It is believed that \$100 will closely approximate the maintenance cost, exclusive of interest for these mechanisms on any road where there is a traffic which requires an average of not less than 500 movements per switch per day. It is to be noted that the electric apparatus is available for operation all of the time, while the use of switchmen is mainly confined to from six to eighteen hours per day.

The first attempts to produce such devices were solely along mechanical lines and the Patent Office undoubtedly has many recorded patents for mechanical devices in its files. Nevertheless a purely mechanical device has never met with favor nor has one ever been produced which has met with sufficient success to warrant its general adoption in electric railway service. According to information from Fred Bland of Sheffield, England, this statement covers the British situation also.

The first automatic track switches were used on horse car lines and consisted of two platforms resting on opposite ends of a pivot lever, somewhat like a see-saw. One platform was at the right hand side of the switch point while the other was at the left. If the switch was

TABLE I—COMPARISON OF COSTS FOR ELECTRICAL AND MANUAL OPERATION OF TRACK SWITCHES

Type of Operation	Hourly Cost	Annual Cost	Annual Saving
Manual Operation, \$3.50 per day of twenty hours.....	\$0.160	\$1,277.50
Electrical Operation:			
Device cost, installed.....		\$285.00	
Interest at 5%.....		14.25	
Annual maintenance expense..	100.00	.013	114.25
			\$1,163.25

to be thrown to the right the horses were pulled over so that they walked on the right hand platform which depressed under their weight, throwing the switch to the right. A heavy ball weight rolled over at the same time, holding the switch in place. If the movement was to be to the left, the horses were pulled onto the left hand platform with the similar results. The chief difficulty with this device was due to freezing and clogging with mud.

Another one of these early mechanical devices is shown in Fig. 1. It was produced in 1892 by C. E. Carey, then master mechanic of the Dry Dock, East Broadway & Battery Railroad Company, now a subsidiary of the Third Avenue Railway, New York City. As will be seen, it depends upon the use of a projecting lug which would be engaged by the wheels of certain cars only, the latter being equipped with wheels having a wider tread or special flanges.

With the advent of electric cars a mechanical device was designed to be put in the ground, using a cam shaped surface to be engaged by a pedal attached to the car platforms and depressed by the motormen. It was not successful because the mechanical part in the ground would freeze and get clogged, while the mechanism on the cars became broken by contact at too great speed with street obstructions. The requirement of parts to be attached to the car was also a disadvantage.

The early electrical devices attempted to follow steam road practice and the operating magnets were placed on the trolley pole at the curb, with connections by means of rods or wires to the switch point. Undoubtedly

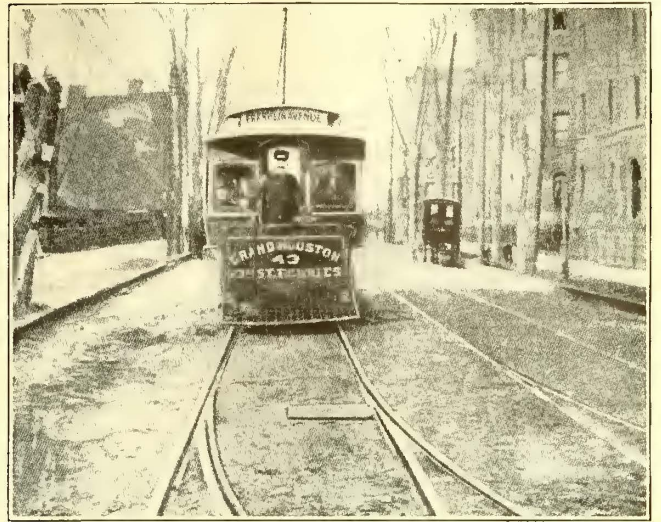
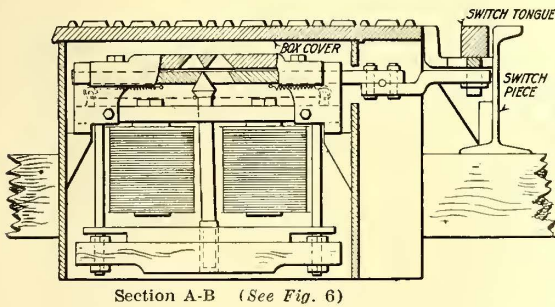


FIG. 2—STREET VIEW OF AN EARLY TYPE OF AUTOMATIC SWITCH

Meanwhile Squires, Cheatham and Baldwin were developing their devices. There is a record of two installations of the Baldwin switch in Brooklyn in March, 1897. They were put on the market by the New York Switch & Crossing Company. It is of interest to note that they were still in service until 1913 when they were removed for replacement with a more modern type. Some details of this device are shown in Figs. 2, 3 and 4 and a wiring diagram is shown in Fig. 6. Squires had his device in service in Springfield, Mass., and



Section A-B (See Fig. 6)

FIG. 3.—SECTION AND VIEW OF A PIONEER ELECTRIC TRACK SWITCH

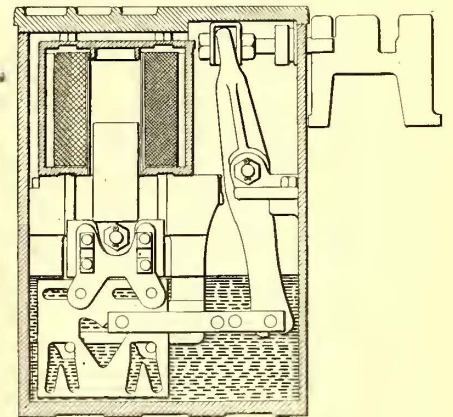
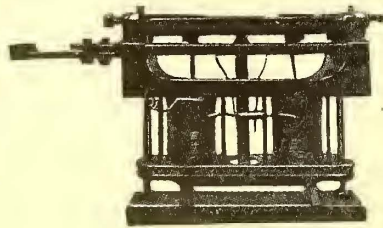


FIG. 5—SWITCH BOX WITH REVERSING CAM PLATE

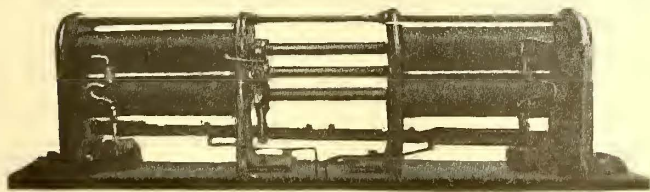


FIG. 4—EARLY DEVICE FOR USE IN CONDUIT TRACK OF METROPOLITAN STREET RAILWAY, NEW YORK

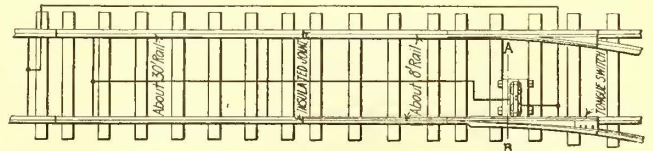


FIG. 6—WIRING DIAGRAM FOR AN EARLY TYPE OF ELECTRIC SWITCH

the placing of the magnets on the poles was for protection against moisture. One of the first electric mechanisms of this kind was the Porter device installed in Detroit, Mich., about 1895 or 1896. Another one of similar design was installed in Brooklyn about 1900 by Spangler. The chief trouble with these designs was due to the fact that the ordinary stuffing box did not keep the water out and the mechanical parts would freeze up.

Cheatham installed his first device in operation in Louisville, Ky., about the year 1899.

These types placed the magnets in a mechanism box in the ground at the switch point, thus simplifying the device and the Baldwin type provided for drainage connection to the sewer, in order to protect the magnets. Cheatham's device placed a water-tight case around the magnets for protection and the Squires device was also designed to be water tight.

The early Baldwin device was operated by an insulated section of the track ahead of the switch, while the Cheatham and Squires mechanisms were operated by overhead contactors. The Baldwin later changed to the overhead contact also. There are three other devices which appeared between 1900 and 1903. These are the Kitt which is and has been used in Denver almost exclusively; the Wooley used in East St. Louis and elsewhere to some extent, and the Collins (American Automatic). The Kitt had two solenoids in the ground box

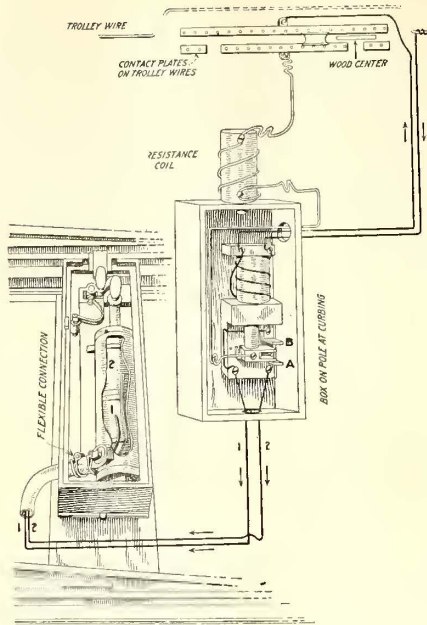


FIG. 7—WIRING DIAGRAM OF A COMPLETE MODERN ELECTRIC SWITCH INSTALLATION

and the circuits were controlled by an electro-mechanical current reversing device. The Wooley had two contactors on the trolley wire and was operated by current "on" or "off" under one contactor or the other as the direction required. The Collins had one solenoid in the ground box and the switch was thrown by a cam plate reversing device, also in the box. (See Fig. 5.) The first Collins devices were designed for underground conduit work in New York and were first used there in 1902. The first Collins devices for regular trolley work were installed in Brooklyn in 1903. The early type of this device was contained in a water-tight box, using an ordinary stuffing box. As this gave some trouble it was superseded by the mercury seal.

It will be seen from Fig. 6 that the modern devices have abandoned the insulated section of track as a factor in their operation and have returned to the overhead wire instead, using some form of contact-making device, operated by the passage of the trolley wheel as a means for setting up circuits which actuate the mechanism.

The development of curb and tower control began about 1904 when the use of automatic switching devices commenced to make headway. The first of these were installed in the Jersey City Terminal of the North Jersey Street Railway and at the Williamsburg Bridge Plaza in Brooklyn. The first complete electro mechanical interlocking for surface street railways was devised by Collins and installed in Washington in 1908.

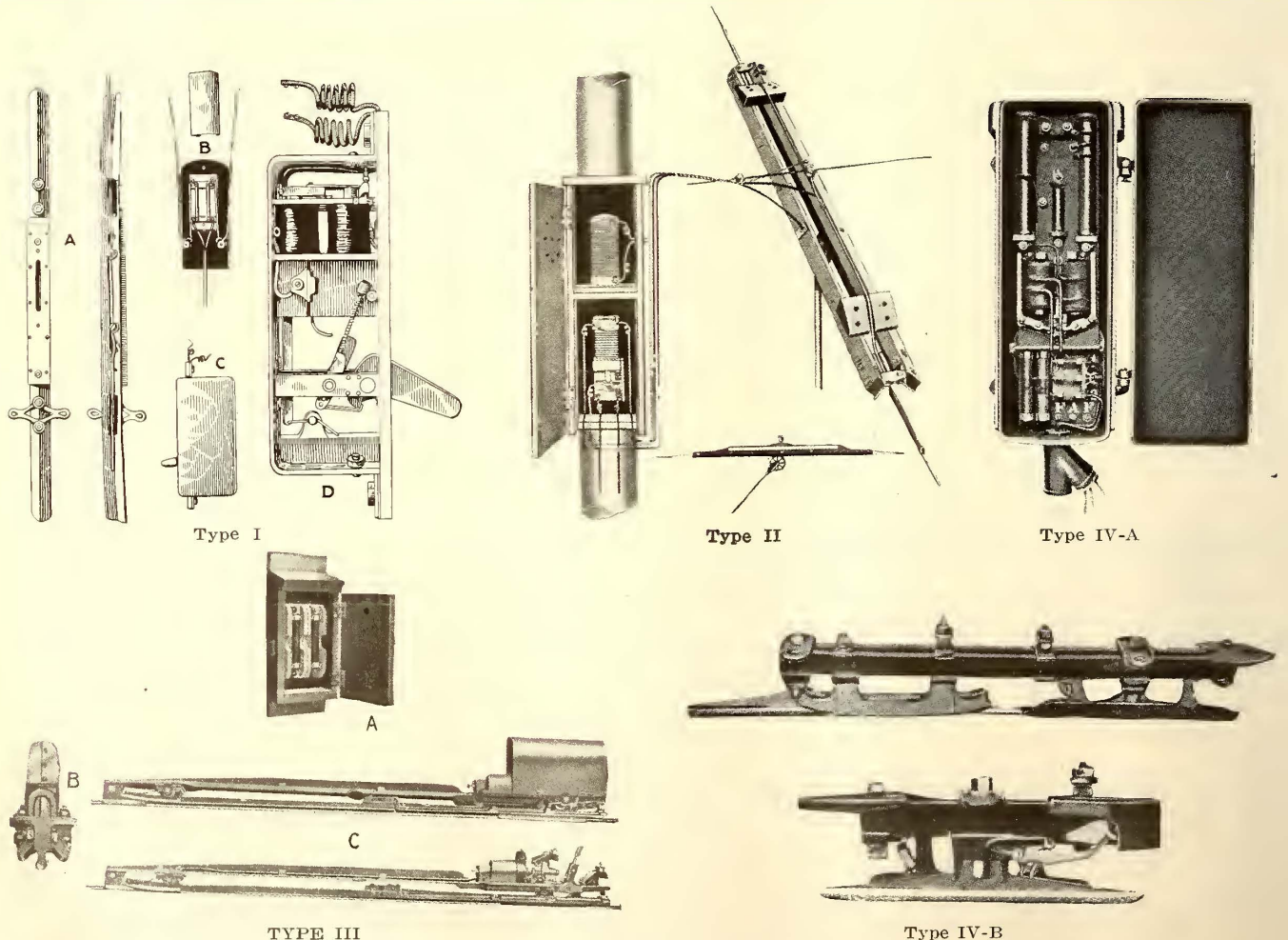


FIG. 8—MODERN TYPES OF CONTACTORS, FUSE BOXES AND CIRCUIT CHANGERS

Type I.—A, trolley contact rail; B, fuse board and cover; C, circuit controller in cover; D, circuit controller on large scale with cover removed. Type II.—Circuit changer and overhead contactor. Type III.—A, fuse box; B, end view of contactor; C, side view of contactor with and without hood. Type IV.—A, relay box; B, starting and stopping contactors.

Perhaps the most radical change in electric switch design is the recent anti-splash type, operated by a small electric motor in the street box, as designed by Collins. This was introduced in 1916 and the first installation was made in Brooklyn in that year. Besides preventing splashing troubles, the device is designed for electric locking to prevent splitting and untimely operation by following cars. The same type of electric lock which is used with this device can be used with other Collins

a small 110-volt motor and trains of gears also located in the street box. (See Fig. 9.) The several devices shown in the figures will be recognized by those who are familiar with such apparatus, but it is not the intention here to indicate either that these are all of the devices available or to express any preference whatever as to the types of apparatus shown.

It is of some interest to note in passing that at least one modern design of street box has the solenoids in a

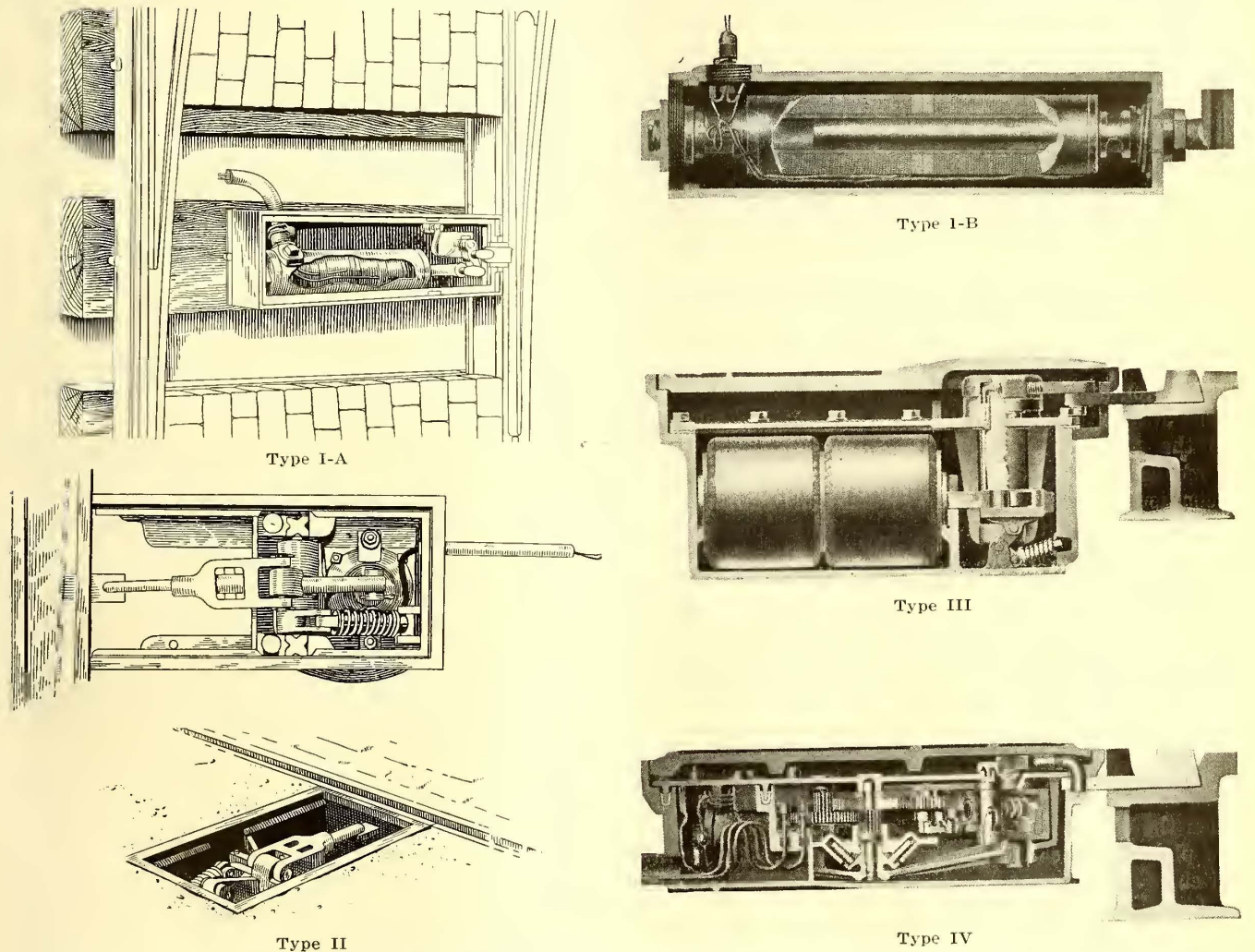


FIG. 9.—TYPES OF MODERN STREET BOX MECHANISMS FOR ELECTRIC SWITCHES
 Type I.—A, mechanism connected to switch tongue; B, water-tight cylinder. Type II.—Switch and switching mechanism in relative positions.
 Type III.—Cast-iron box containing switch-throwing mechanism.
 Type IV.—Street box, mercury seated, with motor and gears.

devices for locking switches against two-car train operation.

Present-day devices consist principally of four main parts, namely, the contactor, the circuit-changer, the fuse box and the main street box. Sometimes the contact device has the circuit-changing device attached thereto, and in some cases the circuit changer is mounted upon the trolley pole at the curb. Several types of contactors, fuse boxes and circuit changers are shown in Fig. 8, while a diagram of wiring of a complete installation is shown in Fig. 7. Views of several street-box mechanisms are shown in Fig. 9.

In general the operation of the switch tongue is accomplished by means of solenoids located in the street box, but a recently developed type does this by means of

vertical position substantially as they were in the early type shown in Fig. 3, although the means for actuating the switch tongue are radically different.

Electric Switches in Underground Conduit Operation

The application of electric switching devices to underground conduit systems on surface lines presents some difficulties not found in ordinary surface operation, since it is necessary to operate the leaves of the conduit slot in conjunction with the switch tongue, thus requiring the movement of the additional weight of the leaves. In consequence a very powerful and rugged apparatus is needed. A drawing of the mechanical connections of the principal type of apparatus in general use on

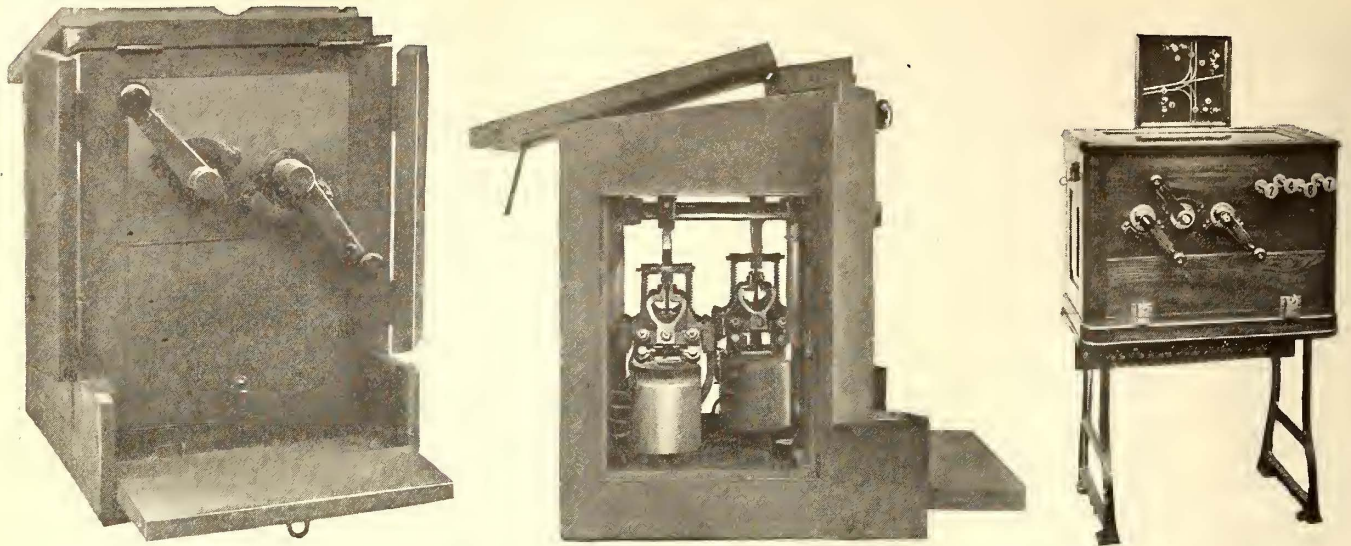


FIG. 10—TYPES OF TOWER AND CURB CONTROL FOR ELECTRIC SWITCH MECHANISMS

conduit lines is shown in Fig. 17, while a very good view of the mechanism is shown in Fig. 18, although the solenoid can not be seen, being hidden by the cylindrical casting. The type shown is in service in New York, Washington and London. It operates as follows:

The switch throwing mechanism has but one solenoid and the motion is transmitted in the two directions by means of a reversing cam plate. The particular mechanism shown in Fig. 18 also has contacts mounted upon it for use with interlocking and these operate the indicators in the tower. In the underground conduit type one of the conductor rails has an insulated section. One of the wires from the solenoid is connected to the live conductor rail and the other is connected to the insulated section.

If the motorman desires to throw the switch, current is applied to the car while the plow is on the insulated rail and the solenoid of the mechanism, being in series with the car motors, becomes energized, its plunger is lifted and the cam plate causes the switch to be thrown. When the car leaves the insulated rail the plunger and cam plate fall back by gravity and re-set to throw the switch in the opposite direction. If the switch is not to be thrown the motorman passes over the insulated section with power off. If the switch is thrown by

hand the reversing cam plate also reverses. There is a toggle movement with heavy spring attached to the switch throwing mechanism to act as a semi-lock and hold the switch point and leaves in the slot rigidly in the position to which they are thrown.

Severe Conditions Must Be Met

There are several rather rigid conditions which electric switching devices must meet in street railway service. They should be composed of the fewest possible parts; they should be simple enough in mechanism and electrical connections to permit the average man of intelligence to maintain them; they must be waterproof

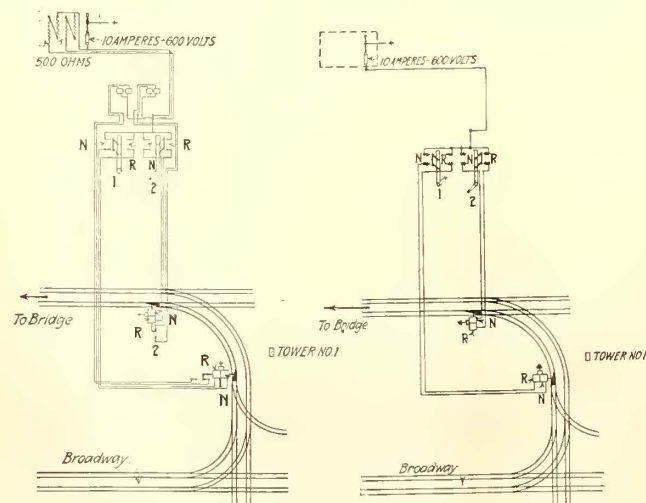


FIG. 11—WIRING DIAGRAMS; AT LEFT, TOWER CONTROL; AT RIGHT, CURB CONTROL



FIG. 12—TOWER CONTROL AT THE BUSY WILLIAMSBURG BRIDGE PLAZA IN BROOKLYN, N. Y.

as far as the parts in the street are concerned; they must prevent any possibility of splitting the switch; they must not require more than ordinary intelligence from the motormen, and they should be non-operative under the combined current required for light, heat and air compressor circuits. Other desirable features are these: Means should be provided to prevent splashing of mud and water upon passengers and pedestrians; it should be impossible for a following car to throw the switch between two trucks of a car which may be passing over the switch; it should not be absolutely necessary

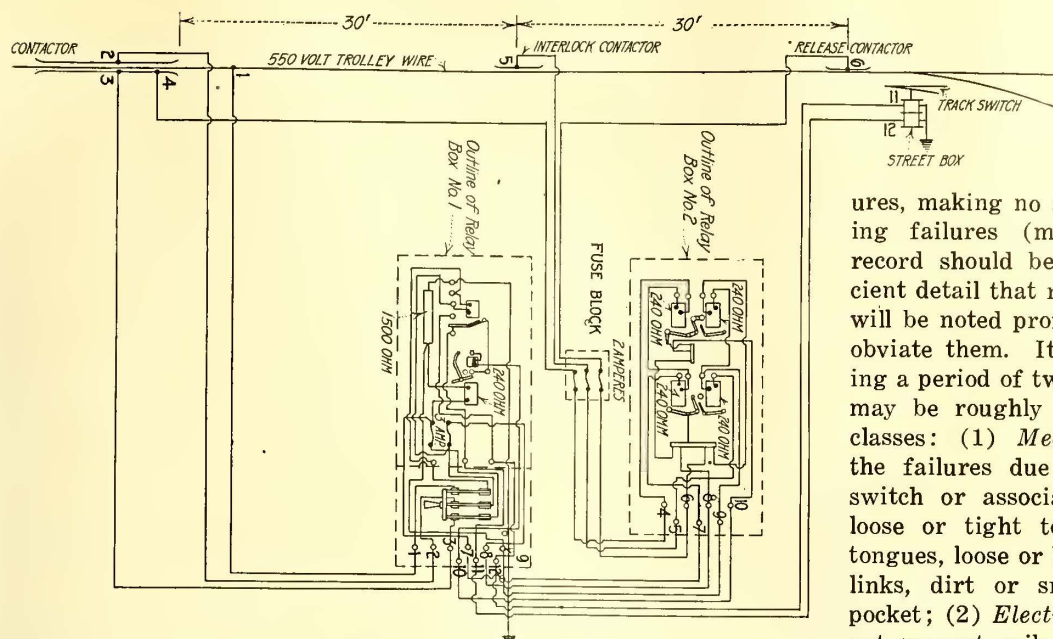


FIG. 13.—WIRING DIAGRAM OF INTERLOCKING FOR ELECTRIC SWITCH OPERATION UNDER TWO-CAR TRAIN SERVICE

for the motorman to see the position of the switch in order to operate it correctly, and it should be impossible for a car to burn out the electrical apparatus by standing with trolley pole directly under the contact device. In two-car train operation, where both cars have their trolley poles in contact with the wire, it is absolutely essential that the second car of the train cannot operate the device.

These somewhat numerous requirements may be summarized into five main factors which should be considered in the selection of automatic switching devices. These are: (1) Perfection of service; (2) economical maintenance; (3) simplicity of design; (4) simplicity of installation, and (5) reasonable first cost.

Where Most of the Operating Troubles Come From

A particularly troublesome factor in connection with electric operation of switches arises from the switch pieces themselves. There are at least eight types of switch tongues which the mechanism may be required to operate. The tongues may vary in weight from 90 lb. to 240 lb. There are at least as many more methods of heel fastenings for switch tongues. It is obvious that the mechanism will work better with certain types of tongues and fastenings than with others. It follows that, in order to obtain the best results, some attention should be paid to the selection of the switch pieces with a view to securing those types which are the most reliable for electric operation. It will even be found advantageous to install the particular switch selected in all cases where electric operation is to be provided.

It has also been noted that track switches which are electrically operated are subject to more abuse from the cars and require more attention for minor repairs, such as "heel tightening," straightening or "shimming," than those not so operated. This is probably due to the fact that the cars are operated over them at greater speeds, since it is often unnecessary to stop the cars before passing over the special work. On the other hand, if the motorman must set the switch by hand, he must stop

to do so and then he cannot do otherwise than pass it slowly. There are at least thirty different things which can cause failures,

making no allowance for car-operating failures (man-failure). A careful record should be kept of these in sufficient detail that repeated defects or faults will be noted promptly and steps taken to obviate them. It has been observed during a period of two years that the failures may be roughly placed in three general classes: (1) *Mechanical*, including only the failures due to faults in the track switch or associated therewith, such as loose or tight tongues, bent or broken tongues, loose or bent connecting rods and links, dirt or snow and ice in switch pocket; (2) *Electrical*, including all burnt-out magnet coils or relays or resistance tubes, blown fuses, wires detached from contactors, worn contactors, defective circuit changers, worn trolley wheels, and weak tension springs in trolley bases; (3) *Operating*, such as fast operation under contactors, failure to use or not to use power at the proper time, failure to preserve proper distance from car ahead. The items of worn wheels and weak tension springs are really mechanical or equipment troubles, and failure due thereto must not be counted against the apparatus. Of course operating failures are not apparatus failures.



FIG. 14.—ELECTRICALLY OPERATED CROSSING DERAIL AND SEMAPHORE SIGNAL

The three groups described have been found to classify themselves into the following approximate percentages of the total "failures" reported yearly: (1) Mechanical, 15 per cent; (2) electrical, 75 per cent, and (3) operating, 10 per cent.

In connection with failures it may be said that the proper measure of electric switch performance is based

upon the total number of car movements per failure without trying to classify the causes. Even this method admits of some discrepancy because very busy switches are subject to excessive heating from their almost constant use and extra trouble may be expected at such locations.

When due consideration is given to the very onerous conditions under which electric switching devices are required to work, their performance in respect to reliability is truly remarkable. It has been observed that, upon one system having 115 devices in service, the average number of operations or movements is 863 per switch per day. The greatest number is 3026 and there are thirty-five which have from 1000 to 2000 movements per day. All the others operate over 500 times daily.

pole to and including the actual magnet coils in the track box at the switch. The only work required of the track department is the adjustment and maintenance of the actual mechanical parts of the tongue switch piece. On one or two roads, however, the track department takes charge from the tongue switch up to and including the relay box on the pole. This is somewhat unsatisfactory, since it divides the responsibility for electrical maintenance between two departments, leading to trouble in placing responsibility for failures and consequent duplication of inspection and emergency calls. There is also a third party, namely, the transportation department, which must assume some of the responsibility for "troubles," since failure to observe the rules on the part of the motormen can cause much trouble and damage.

Automatic Switching at Terminals and Other Congested Points

There are locations on large city systems where car traffic and street traffic are so heavy, and the track switches are so closely grouped, that it is impracticable to attempt automatic operation of the switches. These points of congestion will be found to have a car headway of from forty-five seconds to one and one-quarter minutes. In most cases the operation by switchmen is attended with difficulties, such as dodging cars and vehicles and at some personal risk. These conditions are overcome by the use of tower or curb control devices used in conjunction with the switch-throwing mechanisms of the automatic type. These control devices are shown in Fig. 10.

The tower control consists of a switch control cabinet and resistance board. The operator has in front of him in the tower an indicator board upon which is mounted a model layout of the track and switches, each model switch being electrically operated by contacts in the real switch into positions always in correspondence with its own. Mounted on the control cabinet are control handles, one for each switch and numbered the same as the model switches on the indicator board.

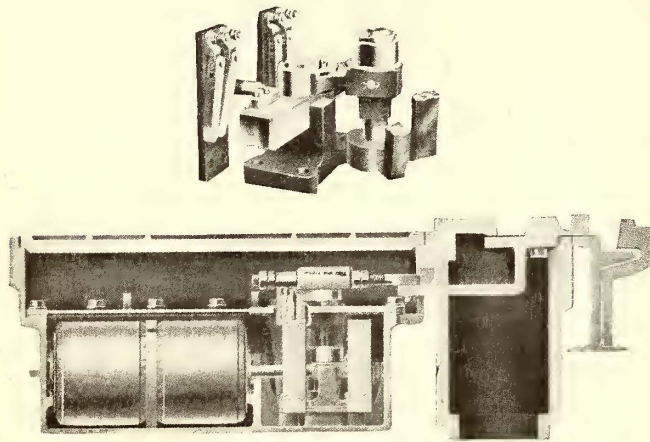


FIG. 15—DETAILS OF CROSSING—DERAIL-THROWING MECHANISM

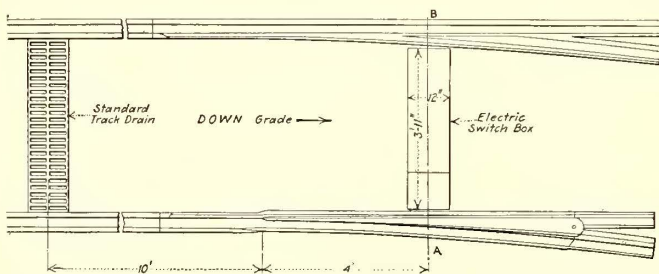
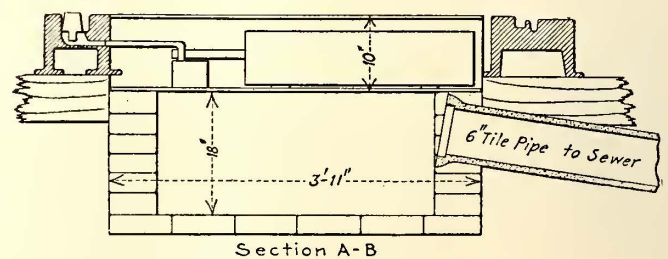


FIG. 16—TRACK SWITCH INSTALLATION SHOWING PROVISION FOR DRAINAGE



There are about 38,205,000 movements per year, and it has been noted that performance records indicate failures due to defects in the device in proportion of one failure to over 46,000 operations as an average for all the switches. On another road there is a record of 117,000 operations to one failure.

The answers to a recent question in the American Electric Railway Association "Question Box" indicate that the electrical department of most companies assumes the maintenance of what may be considered the electric parts, beginning with the contactors at the trolley wire, and extending through the relay boxes on the

The handles have a rotary movement of about 60 deg., being locked in position by a simple latch which the operator must lift to move the handle, thus preventing unintentional movement. Each handle operates a cam which in turn engages a swinging latch of a magnetic blow-out, quick-break switch which makes and breaks the circuits to the solenoids in the switch-throwing mechanisms in the street, throwing the switch in the direction in which the control handle is rotated. Wiring diagrams of tower control and curb control installations are shown in Fig. 11.

In cases where the operator has many switches to

handle it becomes advisable to lock the control handle so that it cannot be moved while a car is passing over the switch. This is prevented by installing two small contactors in advance of the frog on the wire. The first locks the handle by means of a small magnet mounted on the control cabinet and the second contactor unlocks it by similar means after the car has passed the switch. This is a simple form of interlocking, and the difficulties created by two-car trains are

are very many to care for, will require the exclusive services of from one to five men. When their number reaches a hundred or more the latter number of men will have plenty to do as a rule, and they are provided with an automobile for quickly reaching trouble points and covering a large territory. In connection with maintenance the following description of methods for overcoming troubles during the winter season is worth quoting. It is from an article by P. Ney Wilson, covering the practice on the lines of the Connecticut Company at New Haven.

Preventing the Freezing of Electrically Operated Switches

The problem of preventing freezing of switches on the lines of the Connecticut Company is a difficult one on account of the wide variation of temperature and weather conditions. The New Haven lines alone have twenty-seven electrically operated switches and

sixty patented spring boxes of various designs. Aside from salting, which is a common practice, we find the following procedure very satisfactory.

1. When new switches are installed at any season of the year, the tongue and heel tightening device is removed, oiled and carefully adjusted, and the heel box is filled completely with oil-soaked waste.
2. Electrically operated switches require regular inspection and adjustment. A settling box is built under them, connected directly to the sewer. When the switch is installed in a water pocket a track basin is placed so that it will catch sand and dirt before it reaches the switch piece. Salting in snowy weather and oil in dry weather will keep these switches free for satisfactory service.
3. "Anti-kick" spring boxes not equipped with a stuffing box are cleaned and oiled and then filled completely with oil-soaked waste plus a little salt. The waste is packed loosely around the working parts, and care must be taken that it does not interfere with their operation. This treatment applied twice during an ordinary winter will practically eliminate trouble due to freezing.
4. In all spring boxes in which plunger connections operate through a stuffing box the tight compartment should be kept filled with compressor oil.
5. As to the salting of switches at night, we find that the sending of one or more cars over the lines is the cheapest and most effective method of keeping the switches free. These cars salt switches, run through all special work not in regular use and operate all automatic switches.

A Reasonable Amount of Maintenance Necessary

In conclusion, it may be said that electric switching devices, like all other mechanisms, cannot be expected to work perfectly under all conditions and at all times. There are too many adverse factors constantly working to put them out of commission. It can only be expected that a fairly high degree of operating perfection will be obtained, and the measure of success in this will be almost wholly dependent upon the care which is given to the apparatus by the maintenance organization. It must not be expected that the devices will maintain themselves. On the contrary, they require that reasonable amount of inspection and adjustment which should be given to all mechanical and electrical devices.

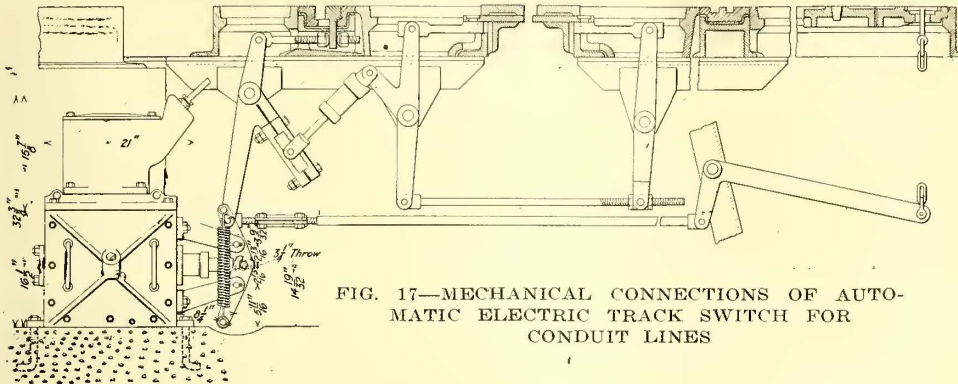


FIG. 17—MECHANICAL CONNECTIONS OF AUTOMATIC ELECTRIC TRACK SWITCH FOR CONDUIT LINES

now being overcome by a similar arrangement applied to the regular automatic devices. A wiring diagram showing how this is accomplished should be of interest. One is presented in Fig. 13.

Apparatus for Operation of Derails at Crossings

A situation somewhat analogous to the traffic conditions at congested points is found at busy surface crossings of steam and street railway lines. At these places, in addition to the crossing gates, it is a safety requirement that the crossing be protected by derailing devices. Where there is a man required to operate the

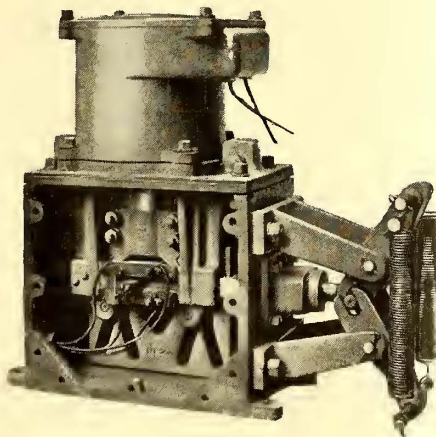


FIG. 18—MECHANISM OF ELECTRIC TRACK SWITCH FOR CONDUIT LINES. SOLENOID IS ENCLOSED IN CAST CYLINDER ON TOP

gates, there is no added labor cost for operation of derailing devices. The electric switch mechanisms lend themselves readily to adaptation for this service. The control device as well as the operating mechanism is substantially the same, and it is only necessary to add a semaphore to complete it. Such an installation is shown in Fig. 14, while the operating mechanism is shown in Fig. 15.

The maintenance of electric switches, where there



"All the Trash in the River Wants to Get Into this Condensing Water Intake"

Keeping Condenser Performance Up to the Mark

By
Hartley Le H. Smith

CHIEF OF TESTING BUREAU
BROOKLYN RAPID TRANSIT SYSTEM

The Power Station Engineer Is Told How He Can Determine the Economy Which He Should Get from His Plant, Then How He Can Correct Causes of Low Vacuum

IN THE writer's article on "Diagnosing and Correcting the Causes of Low Vacuum," which appeared in the Sept. 21 issue of the *ELECTRIC RAILWAY JOURNAL*, the point was made that the variable which exerts very great effect upon condenser vacuum—at the top of the condenser, as elsewhere, and hence in the turbine exhaust connections—and yet which is in no way within the control of the engineer, is the intake temperature of circulating water. It is therefore the rigorously independent variable in condenser performance, and standards of condenser maintenance can only be established as matters relative to it. So important is it in turbine stations that not only does it serve as primary criterion for condenser vacuum maintenance but for comparisons of over-all station economy, or thermal efficiency, as well. A writer in the *Electrical World* of Sept. 28 notices this and illustrates it with a curve drawn between intake circulating water temperature and kilowatt-hours per gallon of fuel oil in an oil-burning power plant. (This curve is reprinted on page 703 of this issue.)

Economy Measured by Vacuum in Terms of Intake Water Temperature

The establishment of the relationship which exists between the highest practically obtainable turbine economy, or power plant over-all economy, and the vacuum in the top of a condenser and at the turbine exhaust nozzle, may be gotten in one way or another, dependent upon test facilities and circumstances, but that relationship which is within the reach of all is to determine the highest vacuum actually attained in terms of intake circulating water temperature. This only requires records of observations kept over a considerable period of time, and naturally the longer the better. All sorts of variable factors conspire to make most observations noticeably less excellent than the best actually attainable, so that in the direction of *poor* results the figures scatter in a haphazard manner when plotted, but in the direction of *best* results they mark out a boundary line which is both smooth in shape and rational in form.

Such a plot is shown in Fig. 1, extending over a period of only about six months and taken in a typical turbine power plant. It covers data not only from nine

different turbine-condenser units, but these units happen to be divisible in the matter of design into groups of three distinct types. All three types are represented at or very near the boundary line.

It is very significant that a plot of the sort shown in Fig. 1 proves that vacuum maintenance at the top of a surface condenser becomes handicapped by the rise of circulating water entrance temperature which takes place during the summer. This is due not merely to the direct effect of the rising temperature but to secondary effects as well, which are somewhat involved but are undoubtedly connected with the rising height of the air cloud, caused by the decreasing efficiency of air removal by the pump equipment during hot weather.

To state the over-all effect briefly it may be said that any plot of the kind shown in Fig. 1 will reveal greater temperature difference between the steam temperature at the top of the condenser corresponding to saturation pressure and the entering temperature of circulating water during summer than during winter.

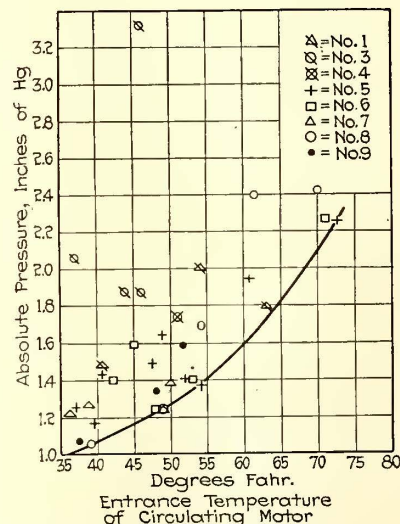


FIG. 1.—VACUUM OBTAINED IN TERMS OF INTAKE CIRCULATING WATER TEMPERATURE

The curve of highest possible plant economy is obtained from the best of these readings.

After the establishment of such a standard it ought to be possible to make a strong drive after good condenser vacuum maintenance, because the operator can tell just how far he can go in condemning the indifferent performances shown by observation, regardless of the season of the year. This should make possible the drawing up in the course of perhaps another year of a new standard plot which would not only better the old one with respect to the boundary line of best

the illustrated form, Fig. 2. It should be noted that if measurements in the air section line are made with the purpose of applying Dalton's law, refinement of measurement should be attempted because rotary pumps of the jet type frequently have quite large displacement, with the result that if small or moderate quantities of air are leaking into a condenser the air in the act of withdrawal may be diffused through such a very great volume of very low pressure steam as to make the detection of the presence of the air, and much more its quantitative measurement, a matter of difficulty. There is the consolation, however, that if air is being withdrawn in large quantity the detection of its presence in the air suction line will not be difficult. It should be remarked also that the Dalton law method

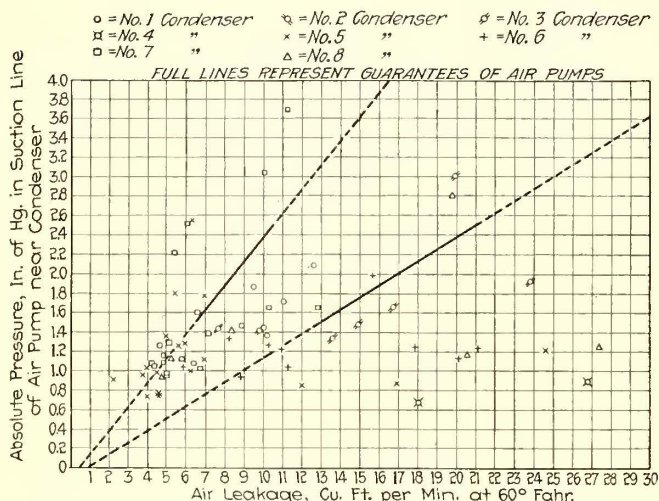


FIG. 3—CHART FOR COMPARISON OF ACTUAL WITH GUARANTEED AIR LEAKAGE

of quantitative measurement of air removal from a condenser is just as applicable to dry-vacuum pump installations as to the others, subject only to the difficulties incurred in pressure measurements in pipe lines supplying any sort of reciprocating pumps.

Other Possible Faults to Which the Form Calls Attention

It may suffice to take up somewhat briefly a number of the remaining items of importance appearing in the form shown in Fig. 2. Where water-sealed glands serve to prevent air from entering the turbine the pressure of water maintained on the gland supply lines by normal pumping action indicate normal or abnormal functioning of the glands with respect to water consumption. If, for instance, the water consumption becomes abnormally large the water pressure will fall and the air-sealing efficacy of the gland will be interfered with, with consequent high air leakage and low condenser vacuum.

The hours that a condenser has run since its last cleaning may affect the vacuum in two ways—it may account for a falling away from the normal quantity of circulating water by reason of trash accumulations actually obstructing the flow, and it may interfere with the transmission of heat through the tubes to the water by reason of the heat insulating effects of mud or sediment in the tubes. The hydraulic circuit of the condenser is capable of being handled much like an electric circuit. The differential pressure across a

condenser varies greatly with the quantity of water flowing through it, but it also varies considerably at constant water flow with different amounts of trash obstructing it, particularly if the obstructing material is to a considerable extent leaves which become plastered over the tube plate.

Again, where open intake wells are used, the fluctuation of levels in them may depend upon more than mere tide level variation. Measurable lost head may occur in them due to perforated openings designed to stop obstructing materials which might be harmful to the circulating pumps. Variation of quantity of water circulated due to any cause will then cause variation of this lost head, but if at some constant quantity of circulating water the lost head in the circulating pump

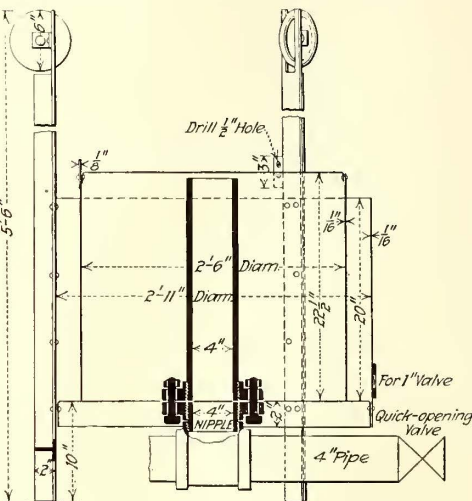


FIG. 4—AIR BELL FOR MEASURING AIR LEAKAGE

suction line increases to values appreciably above normal the the bottom of the open intake well may need cleaning out. The absolute pressure which an air pump can maintain against a closed suction valve has been discussed before. Nothing is more important in vacuum maintenance. It is the prime indication of the pumping ability of the pump. To show forcibly how even the degree of air leakage itself is not more important and may in some installations be distinctly less important than the air-tightness and general perfection of mechanical working of parts, Fig. 3 is published, showing absolute pressure in the suction lines of various pumps in actual service with large variations of air leakage coming through the air suction lines from the condensers. The quantities of air leakage were measured by an air bell. The solid portions of the ruled straight lines were drawn through actual guarantees of the performance of a certain type of rotary pump in which water jet action extracts the air; the upper line representing one pump and the lower line two. The numerous plotted points all represent actual service performance of reciprocating dry-vacuum pumps. The lesson from the plot is clear. If a reciprocating pump is in fine condition it may be capable of removing a great amount of air from a condenser and yet maintain admirably low absolute air pressure while it is doing so. On the other hand, through neglect of skillful maintenance work the absolute pressure may not be notably low even though the air leaking into the condenser and needing to be removed by the pump may be moderate in amount, thanks to a tight condenser.

The use of an air bell gives such powerful means of control of vacuum maintenance by putting air leakage measurement upon a quantitative basis that an illustration of such a bell may be of interest, and is

suction line increases to values appreciably above normal the the bottom of the open intake well may need cleaning out. The absolute pressure which an air pump can maintain against a closed suction valve has been discussed before. Nothing is more important in vacuum maintenance. It is the prime indi-

accordingly shown in Fig. 4. An air bell made from this drawing has been in satisfactory service for several years. The conception of using such a bell for the purpose did not originate with the company with which the writer is connected. So far as he knows it was first used by the New York Edison Company.

As a refinement in the use of an air bell, a hole may be drilled in the top of it and a rubber stopper inserted through which is passed an ordinary chemical thermometer. In this way the temperature of the air may be measured as the bell rises. This allows correction of the air volume to standard temperature to be made.

Relative Life of Manganese and Open-Hearth Rail on Curves

Results of Tests Are Given Showing Manganese Rail to Wear About Seven Times as Long as Open Hearth

BY H. W. ROBERTS

Assistant Engineer of Maintenance of Way,
Elevated Railroads of Chicago

THE accompanying diagrams, which show the wear of rail on the curves of the Chicago Elevated Railroads, will be of interest to the engineering profession in general, as they give a direct comparison between the life of manganese and high-carbon, open-hearth rail.

The curves on which these measurements were taken are all laid with 80-lb. rail, A.S.C.E. section, and are all guarded. The throatway between the running rail and the guard rail is 2 in. on the short-radius curves, and 2½ in. on curves having radii of more than 500 ft. The elevation of the outer rail is not uniform on the various curves, on account of special conditions which must be met, but in general it will run about as follows: For curves having radii less than 250 ft., 4 in.; 250 ft. to 500 ft., 3 in.; more than 500 ft., 2 in.

The wears on the outer and inner rails are given separately, as the wear on the outer rail is somewhat more than that on the inner rail. Speaking generally, however, the life of the two rails is the same, for the reason that by the time the outer rail is worn out, the inner rail is either so badly corrugated or so badly battered at the joints that its removal is also necessary.

The unit of wear which is used is the reduction in the area of the head of the rail in square inches per 100,000 cars; and it was so taken in order that the measurements made on the different branches, where the traffic varies widely, might be reduced to the same basis. The total wheelage over each curve was arrived at by taking the traffic for representative days and applying this as a unit over the entire period. There is, undoubtedly, a small error in the totals arrived at in this manner, but the percentage of error is so small that it is negligible.

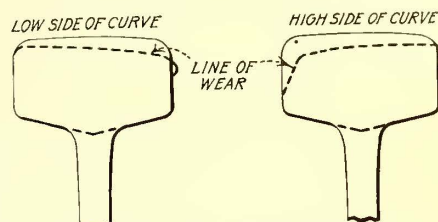
The equipment, at the present time, consists of 1095 motor cars and 575 coaches, the average weight of all equipment being 50,000 lb. per car. The heaviest cars are the steel motors which weigh 69,000 lb., 41,000 lb. on the motor truck and 18,000 lb. on the trailer truck, while the lightest are the coaches, which weigh 33,000 lb.

These cars are all equipped with M.C.B. standard rolled-steel wheels, 34 in. in diameter on the motor trucks and 31 in. in diameter on the trailer trucks. The motor cars are each equipped with two 160-hp. motors,

are braked at a high percentage, and are operated in multiple-unit trains of from two to six cars each. The number of coaches per train bears about the same relation to the total number of cars per train as the total number of coaches bears to the total number of cars on the system.

The maximum wear was found to have been reached when the area of the head of the rail had been reduced by 1.25 sq.in. This was arrived at by taking a number of sections of rail which had been removed from the track, or which was so badly worn that its removal was an immediate necessity.

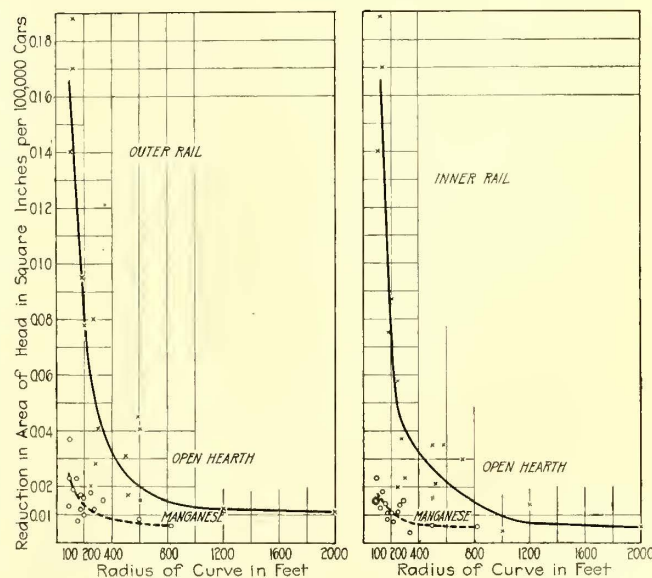
The accompanying rail sections are from manganese rail which had been in the track for 4½ years. This same rail has now been in service for nearly six years and is still in good condition. The best result ever obtained with open-hearth rail on the curve containing this



DIAGRAMS SHOWING WEAR OF HEAD OF 80-LB. MANGANESE STEEL RAIL A.S.C.E. SECTION, LAID IN 1912

rail, which has a radius of 100 ft., was a life of fourteen months, while the average life for open-hearth rail was less than ten months. On another curve of the same radius we have manganese rail which has been in service for seven years, and the average life of open-hearth rail on this curve was also less than ten months.

These results show that the comparison of the wear on the two kinds of rail, as shown on the diagram, is



CURVES SHOWING COMPARATIVE WEAR OF OPEN-HEARTH AND MANGANESE STEEL RAILS ON CURVES

Original area of head of 80-lb. rail, 3.30 sq.in.
Area of head of worn rail, 2.05 sq.in.

conservative, as the diagram shows the life of manganese rail to be about seven times that of open-hearth rail on curves having a radius of 100 ft.

The study described above and the diagrams reproduced in connection with this article were made by the writer for B. J. Fallon, engineer of maintenance of way Chicago Elevated Railroads.

Short, Timely Articles

FOR THE

Way, Mechanical and Electrical Departments

Keeping Account of Trucking Costs The New York State Railways Secures Economical Truck Operation by Making Careful Analysis of Detailed Cost Records

BY C. L. CADLE

Chief Engineer New York State Railways, Rochester Lines

ECONOMY in motor-truck operation is quite as dependent on good operating and accounting practices as in any other business. Systematic operation is usually economic operation, and correct bookkeeping permits of the ready detection of excessive operating charges and affords the only trustworthy source of data for basing comparisons of the economic efficiency of different makes of machines and the relative value of different kinds of supplies. The practice of the New York State Railways, Rochester Lines, with reference to the dispatching of motor trucks was described in the *ELECTRIC RAILWAY JOURNAL* for Jan. 5, 1918, page 45. In response to some inquiries as to operating costs, the data in the accompanying tables are presented.

The gasoline-motor-operated vehicles of this company can be divided into three general classes: line trucks, delivery cars and service cars. The physical characteristics of the first two classes are set forth in Table I. The service cars are runabouts used by the several heads of departments in conducting their inspection work. The duty of these cars cannot, of course, be compared

with that of the trucks, but the data are interesting from the standpoint of showing the operating costs of so-called pleasure vehicles.

To facilitate analysis the several costs, together with the car-mileage for each truck, are tabulated each month for the month and for the year ending with that month, on a form similar to that shown in Table II. The cost figures here presented are for the month of December, 1917, and for the year ended Dec. 31, 1917. The figures under the heading, "Cents per Car-Mile," which are found on the lines beginning "Average," are calculated by dividing the corresponding total cost for all trucks by the mileage for all trucks. The remainder of the table, it is believed, is self-explanatory. The high tire cost for trucks 2, 4, 5, 20 and 22, resulted because the

TABLE I—SERVICE AND PHYSICAL CHARACTERISTICS OF TRUCKS

Truck No.	Weight of Machine, Pounds	Carrying Capacity, Pounds	Total Weight, Pounds	General Equipment	Motive Power	Class of Work Normally Assigned to Each
2	6,000	2,000	8,000	Line and wrecking tools	Gasoline	Overhead line work
3	6,000	2,000	8,000	Line and wrecking tools	Gasoline	Overhead line work
4	6,000	2,000	8,000	Line and wrecking tools	Gasoline	Overhead line work
5	6,000	2,000	8,000	Line and wrecking tools	Gasoline	Overhead line work
20	6,450	4,000	10,450	None	Gasoline	Delivery purposes
21	3,000	1,750	4,750	None	Gasoline	Delivery purposes
22	3,500	1,500	5,000	None	Gasoline	Delivery purposes
23	5,000	4,000	9,000	None	Gasoline	Delivery purposes

TABLE II—COST OF OPERATING MOTOR VEHICLES

Car No.	Car Mileage		Gasoline				Oil				Tires				Repairs				General				Total			
	Month	Year	Month		Year		Month		Year		Month		Year		Month		Year		Month		Year		Month		Year	
			Total Cost	Cents per Car-Mile	Total Cost	Cents per Car-Mile	Total Cost	Cents per Car-Mile	Total Cost	Cents per Car-Mile	Total Cost	Cents per Car-Mile	Total Cost	Cents per Car-Mile	Total Cost	Cents per Car-Mile	Total Cost	Cents per Car-Mile	Total Cost	Cents per Car-Mile	Total Cost	Cents per Car-Mile	Total Cost	Cents per Car-Mile		
White	2652	7404	\$89.50	13.7	\$642.63	8.6	\$8.01	1.2	\$48.75	0.6	\$13.65	2.1	\$834.21	11.2	\$44.08	6.7	\$525.23	7.1	\$8.76	1.3	\$175.04	2.3	\$164.00	25.1	\$2225.86	30.06
White	3335	4164	61.72	18.4	601.46	14.4	5.97	1.7	44.57	1.0	12.60	3.7	50.49	1.2	24.21	7.2	182.60	4.3	8.76	2.5	175.04	4.1	113.26	33.8	1054.16	25.31
White	4400	6635	70.64	17.6	606.15	9.1	5.61	1.4	48.21	0.7	3.30	0.8	826.78	12.4	57.94	14.4	471.10	7.1	8.76	2.1	175.08	2.6	146.26	36.5	2137.32	32.06
White	5574	6863	68.67	11.9	602.89	8.7	5.30	0.9	54.11	0.7	6.10	1.1	1404.31	20.4	142.45	24.8	910.96	13.2	8.76	1.5	175.08	2.5	231.29	40.2	3147.35	45.85
Average	490	6266	\$72.63	14.8	\$613.28	9.8	\$6.15	1.3	\$48.91	0.8	\$8.91	1.8	\$778.98	12.5	\$67.17	13.7	\$522.47	8.4	\$8.76	1.7	\$175.06	2.8	\$163.70	33.4	\$2141.17	34.3
Seldon Ford Jwt.	20805	10415	\$84.88	10.5	\$721.51	6.9	\$7.90	1.1	\$68.69	0.6	\$4.85	0.6	\$422.43	4.0	\$189.89	21.1	\$679.10	6.5	\$8.77	1.0	\$180.07	1.7	\$296.29	35.5	\$2071.80	19.81
White	21685	8347	45.78	6.6	429.55	5.1	5.65	0.8	69.56	0.8	0.00	0.0	169.70	2.0	146.58	21.4	731.89	8.7	8.77	1.3	175.08	2.0	206.78	30.2	1575.78	18.87
White	22815	8107	57.04	7.0	412.18	5.1	4.94	0.6	34.04	0.4	171.97	21.1	549.37	6.7	51.56	6.3	289.04	3.5	8.77	1.0	174.76	2.1	294.28	36.1	1459.41	18.00
White	23870	3562	60.26	6.9	196.47	5.5	5.97	0.6	18.96	0.5	14.73	1.6	18.16	0.5	4.06	0.4	58.69	1.6	8.77	1.0	48.03	1.2	93.79	10.7	340.31	9.55
Average	794	7608	\$61.99	7.9	\$439.93	5.8	\$6.12	0.7	\$47.85	0.6	\$47.89	6.0	\$283.91	3.8	\$98.02	12.3	\$439.68	5.0	\$8.77	1.1	\$144.48	1.9	\$222.78	28.1	\$1361.82	17.90
Ford	30812	10385	\$9.30	1.1	\$166.52	1.6	\$2.50	0.3	\$7.14	0.1	\$19.80	2.4	\$195.80	1.8	\$44.03	5.4	\$167.12	1.6	\$8.77	1.0	\$156.01	1.4	\$84.40	10.3	\$692.59	6.66
Ford	31800	8515	9.55	1.2	143.72	1.6	2.14	0.2	6.93	0.1	4.86	0.6	108.10	1.2	22.64	2.8	112.38	1.3	8.77	1.0	156.00	1.8	47.96	6.0	527.13	6.19
Ford	32543	12590	19.22	3.5	208.80	1.6	4.20	0.7	9.24	0.1	2.25	0.4	101.59	0.8	9.10	1.6	111.11	0.8	8.77	1.6	156.00	2.0	43.54	8.0	586.74	4.66
Ford	33329	7643	11.45	3.4	118.11	1.5	2.72	0.8	4.80	0.1	1.00	0.3	95.16	1.2	19.06	5.8	125.93	1.6	8.77	2.6	156.00	2.0	43.00	13.0	499.98	6.54
Overland	34350	5353	12.68	3.6	110.10	2.0	0.71	0.2	3.83	0.1	34.55	9.8	282.22	5.2	27.60	7.8	157.39	2.9	8.77	2.4	98.33	1.7	84.31	24.0	651.87	12.17
Ford	35329	329	13.07	3.9	16.31	4.9	2.84	0.8	3.32	0.1	0.00	0.0	0.00	0.0	34.41	10.4	46.56	14.1	8.77	2.6	-8.77	2.6	59.09	17.9	74.96	22.78
Average	533	7469	\$12.54	2.4	\$127.26	1.7	\$2.52	0.5	\$5.88	0.1	\$10.41	2.0	\$130.48	1.7	\$26.14	4.9	\$120.08	1.6	\$8.77	1.7	\$121.85	1.8	\$60.38	11.5	\$505.54	6.8

Editor's Note—In the original table the garage cost per month of \$2.62 for each truck or car was itemized separately. However, on account of space limitations it has been included in the general charges listed in this table.

trucks were equipped with pneumatic tires when originally purchased. It was found after considerable experience that a special solid tire purchased from the Overman Company, New York, gave the best tire economy on a car-mile basis. These tires cost approximately \$650 for one complete set, dual rears and single fronts. Offsetting this cost, however, is the fact that these tires have a guaranteed mileage of 15,000 as against 6000 miles for the pneumatic tires. Our experience has been that the use of these tires reduces our tire cost per car-mile by about 50 per cent.

Ice Cutter Made From a Snowplow

A Simple but Effective Device Which Proved a "Life-Saver" in Schenectady Last Winter

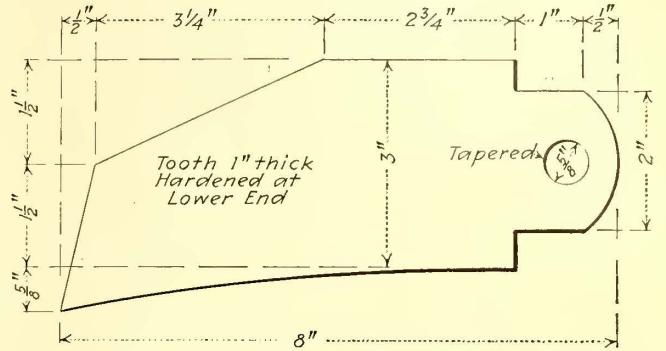
FOR use in the winter of 1916-1917 the Schenectady (N. Y.) Railway constructed the ice-cutting attachment for one of its snowplows which is shown from two angles in the accompanying illustrations. The plow was one of several that had been built some time previously in the company's shops. The rigging can readily be placed on a sweeper body, using materials available in any shop storeroom.

On one end of the underframe three malleable-iron broom-bearing brackets were attached, one in the middle and one on each side of the diagonal head block from which the plow formerly hung. In the bearing housings on these brackets coiled springs were placed over the bearings to resist the upward thrust from the cutter spindle which replaced the rotary broom.

The cutter spindle consists of two built-up wood drums, 18 in. in diameter, mounted on the ordinary broom shaft. On the drum surface are numerous cutters or teeth of the form and dimensions given in the scale drawing reproduced herewith. The cut-

studded with sixteen teeth each. The inside collars are $\frac{3}{4}$ -in. x 3-in. steel, with six teeth each. The total number of teeth is, therefore, seventy-two. The halves of each split collar are drawn together with two $\frac{3}{4}$ -in. bolts on each side.

The shanks of the cutters are inserted in the collars and are held loosely in place by means of the tapered

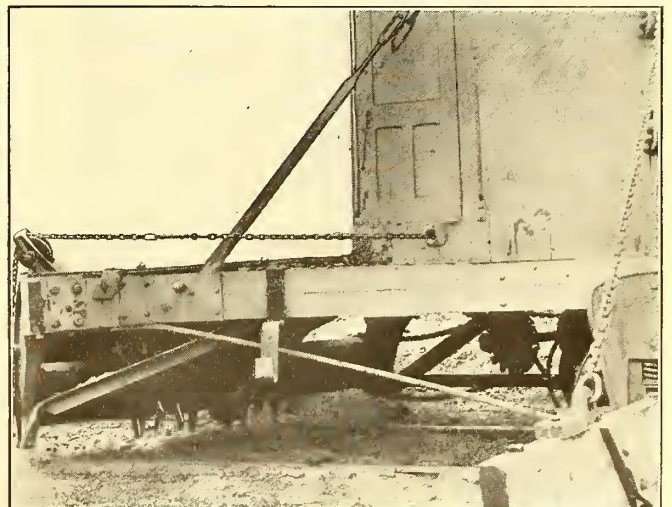
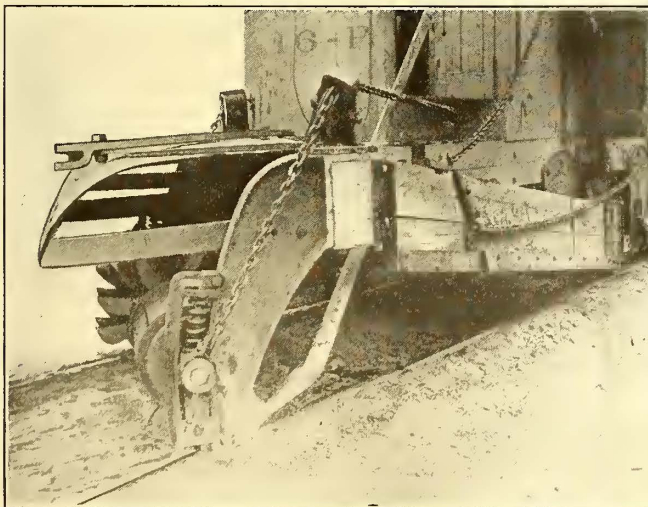


DIMENSION SKETCH OF STEEL TOOTH FOR ICE CUTTER

plugs. These in turn are locked in position with cotter pins. The wood drums are recessed to accommodate these, thus providing a keying effect of the collars against rotation, supplementing friction.

Provision is made for raising and lowering the outer spindle by means of chains attached to the bearings and winding upon a shaft driven from a geared hand-wheel staff. The driving motor is a GE-52 motor on the floor of the cab, geared to a jackshaft mounted in the axle bearings. By means of a chain the jackshaft in turn drives a countershaft under the body, from which chain drives lead to the cutter spindle and to a rotary broom at the rear end.

With the cutter on one end, the broom on the other, and the two wing plows on the side, this outfit is most



TWO VIEWS OF ICE-CUTTING ATTACHMENT FOR SNOWPLOW, SCHENECTADY (N. Y.) RAILWAY

ters are of steel, hardened for about one-half their height from the cutting end. On the other end is a tapered hole, $\frac{3}{8}$ in. in diameter at the large end, for the reception of a tapered plug. For the purpose of holding the cutters there are three split collars on each drum, two wide ones outside carrying two rings of teeth each, and one in the middle carrying one ring. The outside collars or straps are of $\frac{1}{2}$ -in. x 7-in. steel,

convenient for work too heavy for a sweeper. It is particularly adapted for service on one-way streets. The wing plows have the usual control, one handwheel raising the heel and one the toe, a third being used to pull the wing out to the desired angle.

The ice-cutter scheme was the joint idea of F. J. Doyle, master mechanic, and W. G. Miller, now with the electric railway at Havana, Cuba.

Some Experiences with Low-Voltage Control

The Author Describes the Methods Necessary in the Maintenance of Low-Voltage Car Equipment to Prevent Trouble

BY O. GOTTSCHALK

Master Mechanic Richmond Light & Railroad Company,
New Brighton, N. Y.

TWO of the most essential points in the maintenance of low-voltage control equipment are to have all connections tight and all contact surfaces clean. Experience has shown that 90 per cent of the trouble occurring comes from one of these two causes.

ALL INSULATION MUST BE KEPT CLEAN

Insulators are often located so that they are very difficult to get at for cleaning. In such cases, the best method is to blow the dirt and metallic dust off with compressed air. The insulation is sometimes in a delicate state due to heating, which tends to cause it to become brittle. If too high air pressure is used, the insulation is liable to be destroyed by the force of the blast. My experience has indicated that 40 lb. of air is the best for use, as this has sufficient force for cleaning and involves less danger of damaging the insulation than would a higher pressure. The air used must be free from moisture and vaporized oil, as both of these have an affinity for dirt and metallic dust.

HOW CONTACTS ARE CLEANED

The cleaning of interlocking contacts is best done by using a fine grade of sandpaper (No. 1 preferred). After using the sandpaper, the contacts should be wiped off with a cheap grade of cheesecloth. Waste should never be used for wiping off contacts, as small pieces are liable to become detached and cling to the contacts so as to cause open-circuits or improper contact which will result in burning of the contact surfaces. After the contact surfaces are thoroughly clean, they should be lubricated slightly with a good grade of vaseline. Care should be taken not to apply too much, but just sufficient to lubricate thoroughly, as arcing vaporizes the vaseline and this causes the arc to hold longer than it would otherwise. Dirt and metallic dust will accumulate, but with proper lubrication it will remain in a soft state and the contact surfaces will be kept clean with each wiping action.

In cases where contacts have little or no wiping action, such as interlock contacts and relay contacts, the best results are obtained by making one contact surface of carbon. I have found this an excellent opportunity to use up worn-out motor carbon brushes. It has been found that where metal against metal is used for such contacts a small arc will cause carbonization with sufficient resistance to prevent the flow of the low-voltage current. When one surface is made of carbon the arc disintegrates the carbon only and leaves the metal surface clean. The disintegrated carbon, being of a soft composition, does not remain on the surface of the contact, but is carried away in the form of soot by the heat generated by the arc.

Where carbon contacts are used it is necessary to back them up with a suitable support to avoid excessive breakage. With interlock contacts which have a sliding

or wiping action, I have found that the best wear is obtained by using a spring steel finger and a contact plate of cold-rolled copper. Cast brass or copper should never be used for contacts that make and break, as the metal often contains minute blowholes and is of such soft composition that imperfect contact will cause welding. Inspectors should be careful to see that all contact surfaces wear evenly. If uneven wear takes place or if point contact exists, excessive heating will take place and welding will result.

Cylindrical contacts should not be allowed to get out of round as this will result in unequal pressure on the various parts of the contact surfaces and cause welding or arcing.

Other repairs that require attention by the inspectors are the arc deflectors or division plates. These should be cleaned carefully, as any accumulation of dirt or metallic dust will serve as a conductor for the arc and may cause a short-circuit. Careful adjustment of all contact fingers should be made so that the cylinder contacts strike at a point which is about one-third the thickness of the finger metal. Where fingers have excessive vibration, it has been found that this often causes stubbing when rapid opening or breaking of the circuit takes place.

JUMPERS REQUIRE CAREFUL INSPECTION

The service obtained from jumpers depends upon the amount of handling which they receive and also upon the manner in which they are handled. On roads where trains are cut frequently it has been found necessary to replace all jumper cable at least once each year. The greatest percentage of failures occur inside the jumper head and about 1 in. away from the point where the cable enters the jumper. These failures are caused by switchmen using the cable to pull the jumper out of the coupler socket, or by pounding the jumper head when it is not easily inserted or removed as often occurs in wet or freezing weather. These switchmen are usually not over-careful to strike the metal head only, but strike the insulation as well which causes the damage. Operating men are bound to use the easiest method for their labor at all times, and excessive damage can only be prevented by the mechanical department using such designs of jumpers as will be easy to remove and replace and make certain that they are kept in easy working condition at all times.

Proper inspection should include the cleaning and spreading of all male and female contacts of the jumpers. Any corrosion will prevent or interrupt the flow of current.

In making up jumpers I have found the following to give the best results: Wires attached to the terminals inside the jumper heads should be secured with solder composed of 90 per cent of tin and 10 per cent of lead. This composition gives the greatest strength. A piece of leather or rubber should be placed around the cable inside the head and at a point where the cable passes through to the inside. A rubber bushing installed around the cable at the point immediately outside of the head and under the bell casting will prevent water from entering. For filling in the heads with compound, two small holes should be drilled in the head casting. One of these is for use while pouring in the asphaltum com-

pound after it has been heated to a liquid state and the other permits the hot air to escape and insures a solid compound without cavities. This compound secures the wires firmly and prevents chafing. It also acts as an insulation and protects the wires from moisture. Where possible the compound should be forced in under pressure, as this gives a more even distribution inside the head.

PREVENTING AND LOCATING WRONG CONNECTIONS

With multiple-unit control equipment it often happens that after repairs have been made to jumper sockets the men performing the work neglect to get the wires connected to their proper contact posts and also frequently leave loose or short-circuited connections. The best method for locating wrong connections and insuring that all is in proper condition before the car is allowed to go into service is to make use of a bank of lamps with each lamp representing a given wire in the train line. This bank of lamps should be connected to a test jumper head which is inserted in the coupler socket being tested. The controller is then moved to its various positions and record is made to see that the proper lamps become lighted as each point of the controller is reached.

Frequently trouble which cannot be located with the bank-of-lamps test will develop. For such cases I have found what has been termed "shooting the circuits" to be a satisfactory test. This is made by grounding each individual train wire successively and applying 600 volts to the wire under test through a 20-amp. fuse. This test will cause loose connections to become welded or burnt off and the short-circuited or burnt-off connection can then be easily located. All jumpers should be put through a 30-amp. test at least four times a year. Suitable testing apparatus can usually be made in the shop by using lamps or heater coils so arranged as to give the desired value of current and by having suitable switches so connected that a lamp will indicate the wire which is being subjected to the heavy current test. In making this test the jumpers should be in the same position as when they are used between cars, and in addition, they should be moved about and pulled by hand, as this will facilitate locating any weak connections or partly broken wires.

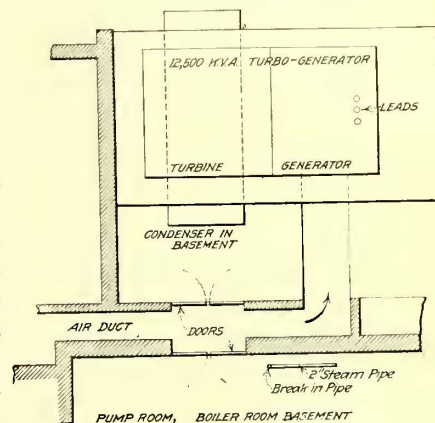
Generating Plants of Large Capacity Save Fuel

The *Tramway and Railway World*, of London, reports from a German source of information that at least one economist in Germany favors a state power monopoly after the war on grounds of fuel economy as well as on financial grounds. He thinks that all the railways and all industrial and agricultural plants should be electrified and that electricity should be produced in large plants of 100,000 kw. and distributed over high-tension mains at 100,000 volts. He calculates that by electrifying the railways it will be possible to save at least one-third of the coal consumed by them, which amounted to about 20,000,000 tons in the year immediately before the war. He urges that the state should endeavor to reduce home consumption of coal by a third and should reckon to make the most of its profit on coal for export.

Turbine Generator Burn-Out Caused by Steam Leakage

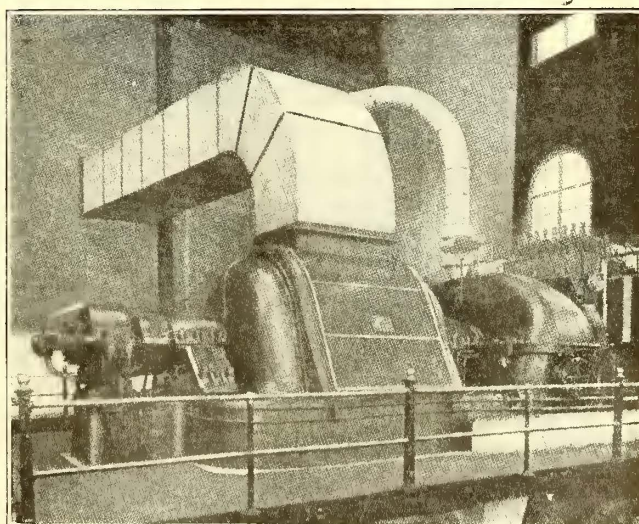
Failure of Union in Steam Pipe Allowed Steam to Be Sucked Into Air Duct Leading to Generator

SOME months ago the 12,500-kva., three-phase, 60-cycle, 11,000-volt generator, in the Reeves Avenue power house of the Virginia Railway & Power Company at Norfolk, described in the issue of this paper for Dec. 23, 1916, short-circuited when carrying a load of about 6000 kva. The accident had such a serious effect on the local transportation that a notice of it was printed in the issue of this paper for Aug. 24. Inquiry of the company elicited the following details of the accident: Air for the turbine ventilation comes from outside the building



GENERAL ARRANGEMENT OF APPARATUS INVOLVED IN SHORT CIRCUIT

through a masonry duct constructed on the turbine room side of the division wall which separates the turbine and boiler rooms. It is discharged through a galvanized duct into the boiler room above the boilers. The main steam header is located along the division wall on the boiler-room side, and the steam connection for the turbine is taken off above the boilers and passes through the division wall direct to the turbine. There



TURBO-GENERATOR WITH DISCHARGE DUCT IN REEVES AVENUE POWER PLANT, NORFOLK, VA.

is a drop leg near each end of the main steam header which leads to the boiler-room basement with steam trap at the lower end. Steam for the auxiliaries is taken off a short distance above the bottom of the drop leg.

The accident was due to a failure in a 2-in. union in a pipe between the bottom of the drop leg and the

steam trap, about 6 ft. from the bulkhead door in the wall of the air duct leading to the generator. This door was necessary for removing condenser tubes. This bulkhead door was built to insurance specifications and was originally a close-fit. A slight inequality in the mason work at the bottom had been produced, however, in removing condenser tubes. Steam from this leak at the union was sucked through the bulkhead door into the air duct and the generator.

The damage to the generator consisted of the burning off of three leads from the terminal blocks. About a foot of 15,000-volt, 1,000,000-circ. mil cable, insulated with varnished cambric and rubber, and flameproof braided, was also melted. The insulation on the end of all coils extending beyond the lamination slots was almost entirely burned off. The heat from the burning insulation fanned by the ventilating air damaged the end shield and the laminations for some distance from the end.

Straightening a Car Axle in Ten Minutes

By Utilizing a Wheel Press for Axle Straightening the Cleveland Railway Has Reduced by Nearly 80 per Cent the Time Required for This Operation

BY H. C. EBELING

Engineer, Cleveland (Ohio) Railway.

THIS company has had very good success with an attachment for use in connection with its wheel press by means of which it has been possible greatly to reduce the amount of time necessary for straightening axles. The equipment is shown in the accompanying pictures.

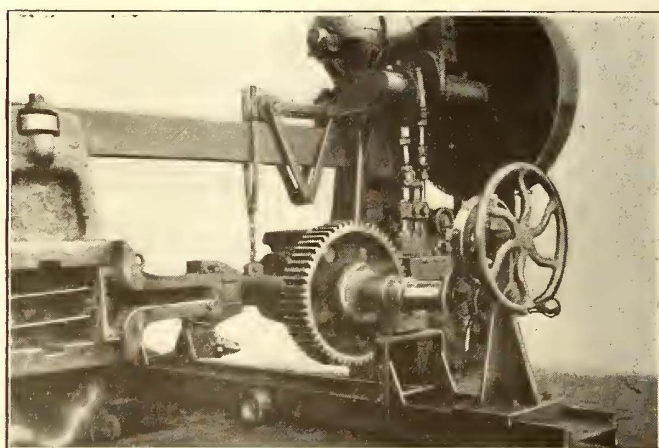
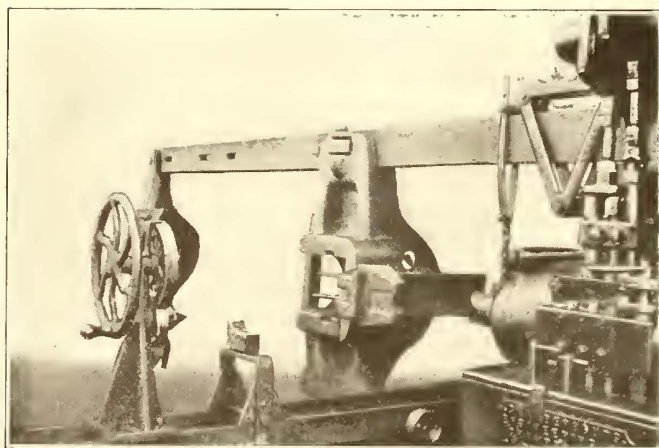
The equipment consists essentially of three parts: a carriage with centers for supporting the axle and provi-

The rotating and supporting mechanism consists of two standards, mounted on a 10-in. I-beam lying flat-wise. At the tops of the standards are adjustable centers by which the axle is secured. Connected with one center is a small crank which engages with the projection of a lathe dog clamped on the axle. This center is connected through a pair of gears to a hand wheel by means of which the axle is easily and positively rotated.

Two blocks are provided beneath the axle to take the weight when the axle is removed from the centers. These blocks also assist in testing, as they provide surfaces upon which a straight edge can be laid to be used as a support for the operator's hand. The tests for bent portions of the axle are made by touching the high points with a piece of chalk as the axle is rapidly rotated. The operation of straightening an axle consists simply in applying force, at the high points indicated by the chalk marks, which bends it back toward its original shape.

From the description it will be obvious that the operation of testing, pressing, testing again, etc., is a very simple one with this equipment. The operation is kept up, of course, until, in testing, the chalk makes a complete circle around the circumference. In straightening an axle it is not necessary to remove the gear or to remove the axle from the centers when applying pressure.

A casual observer might inquire why a large company like ours does not have a machine designed especially for straightening axles. The fact is that we have such a machine but it is too slow, being fitted with a hand-operated hydraulic ram. When it is used, the axle is supported on pillow blocks near the bend and pressure is applied by means of hydraulic plungers. It takes considerable time and man power to pump up to 5, 10 or 12 tons, and all of this work is lost when the pressure is released and the axle rotated to deter-



WHEEL PRESS EQUIPPED FOR STRAIGHTENING AXLES AT HARVARD AVENUE SHOP, CLEVELAND (OHIO) RAILWAY. AT LEFT, VIEW SHOWING THREE ESSENTIAL PARTS OF STRAIGHTENING DEVICE. AT RIGHT, BENT AXLE IN POSITION FOR STRAIGHTENING

sion for rotating it, a base block mounted on the yoke of the wheel press, and an elongation of the plunger of the press through which the force is applied to the axle.

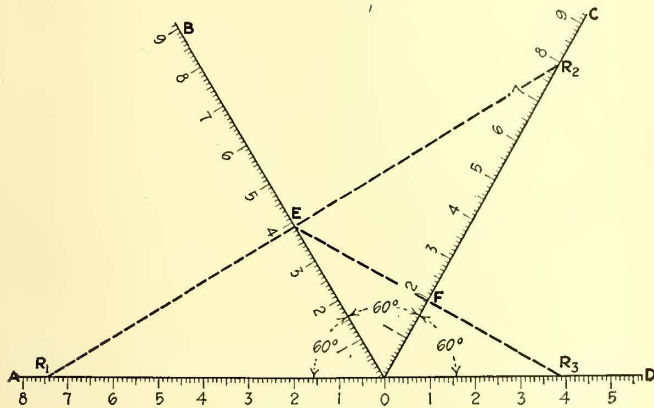
The base block mounted on the yoke is provided with movable pillow blocks arranged to receive the axle, while the plunger extension consists of a short shaft having the end which comes in contact with the axle notched to prevent slipping on the latter.

mine whether or not the bend has been removed. This loss of time and energy is considerable, as an axle must sometimes be tested as many as ten times before it is pronounced straight. With the hydraulic apparatus it required about forty-five minutes to straighten an axle, while now we are able to straighten one in ten minutes, the saving being due in part to the fact that the wheel press is power driven.

Short-Cut for Finding Combined Resistance of Multiple Circuits

Simple and Fairly Accurate Graphical Method for Determining the Value of Several Resistances, Connected in Parallel

WITH certain practical problems, especially those connected with distribution systems, it is frequently necessary to calculate the combined resistance of several circuits connected in parallel. When there are a large number of these circuits, the standard method of calculation becomes somewhat tedious. A



GRAPHICAL DETERMINATION OF RESISTANCE OF MULTIPLE CIRCUITS

considerable amount of this routine work can be eliminated by using the following graphical method.*

The method is best illustrated by the solution of a practical problem. Let us find the combined resistance of an overhead trolley system consisting of two trolley wires for two parallel tracks fed from a common feeder. The trolley wires have a resistance of $7\frac{1}{2}$ and 8 ohms respectively and the feeder 4 ohms.

The solution of the problem as indicated in the accompanying diagram consists of drawing four lines with each pair including an angle of 60 deg., along the first line OA lay off the resistance of the first trolley wire, $7\frac{1}{2}$ ohms equal to OR_1 , then along the third line OC, lay off the resistance of the second trolley wire 8 ohms equal to OR_2 , draw the line R_1R_2 , this intersects the second line OB at E and the distance OE measured to the same scale as was used in laying off the previous values

*This graphical method is a short-cut solution of the algebraic equation of parallel circuits. The theory of the method, as given in a recent issue of the *Revue Generale de l'Electricite* is as follows:

Consider axes of rectangular co-ordinates OX and OY and draw two straight lines passing through the origin O and making an angle of 60 deg. with the axis OX as shown in the accompanying diagram.

Lay off on these lines two lengths OA and OB proportional respectively to the resistances R_1 and R_2 of two conductors connected in parallel. The points A and B determine a straight line AB whose equation with respect to the system of co-ordinates is $X(R_1 + R_2) - Y(R_1 - R_2) - R_1R_2 = 0$.

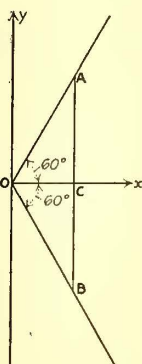
The line AB cuts the axis OX at a point C. This intercept may be expressed by the equation

$$x = \frac{R_1R_2}{R_1 + R_2}$$

This may also be written

$$\frac{1}{x} = \frac{1}{R_1} + \frac{1}{R_2}$$

This equation is the same as that of the standard formula used for determining the combined resistance of two parallel circuits and shows that the length OC is proportional to the resistance of the combined conductors R_1 and R_2 when connected in parallel.

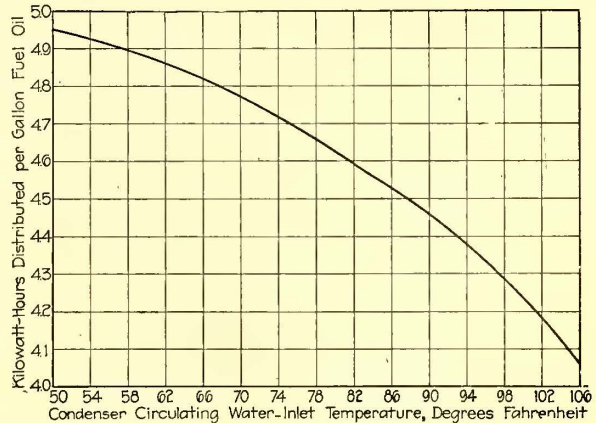


is 3.9 ohms. This gives the combined resistance of the two trolley wires. Next lay out the resistance of the feeder, 4 ohms along the line OD as indicated by the distance OR_2 and draw the line R_2E . This intersects the line OC at F and the distance OF measured to the same scale as the preceding is 1.97 ohms. This is the combined resistance of the three circuits which we are considering. Should there be a fourth resistance in circuit, this is then laid off along the axis OA and the operation continued as already described.

Like all graphical methods the accuracy of the result depends to a certain extent upon the scale which is used. This method, however, will be found very convenient for checking results, and where extreme accuracy is not necessary it gives a quick and less tedious method than the usual calculation.

Relation of Intake Water Temperature and Power Plant Efficiency

IN THE ISSUE of this paper for Sept. 21, Hartley LeH. Smith emphasized the importance of the temperature of the intake circulating water in connection with the turbine vacuum and, therefore, the plant efficiency. His point is illustrated by the accompanying "bogie" curve from the Houston Lighting & Power Company, Houston, Tex. This was prepared from the steam curve of the turbine to show the output per unit of force with different intake water temperatures. The per-



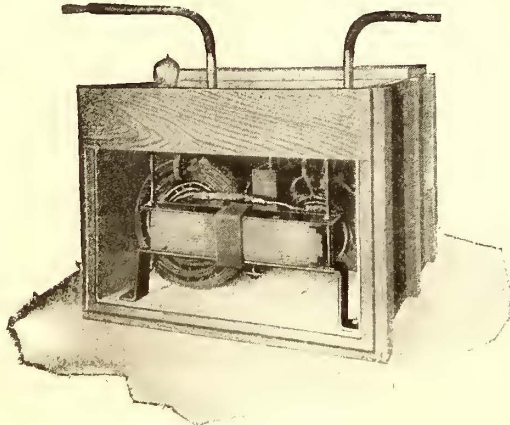
"BOGIE" CURVE OF EFFICIENCY OF POWER PLANT AS INDICATED BY OUTPUT PER UNIT OF FUEL

centage by which each day's results are above or below the "bogie" is posted in the turbine room to indicate the actual economies which are being achieved in the station.

The New York State Railways, Syracuse lines, is installing an acetylene generator at its Wolf Street shops, for the purpose of supplying gas for cutting and welding. This is being done on account of difficulty in procuring gas, although carbide and oxygen are readily obtainable. A concrete foundation has been placed outside the shop wall to support the generator, which will be covered with a light protecting structure. Heat will be supplied from the hot water system used in the shops. The generator is of the Vulcan "positive pressure feed" type, holding 50 lb. of carbide and producing 56 cu.ft. of gas per hour.

Portable Transformer Used for Electric Arc Welding

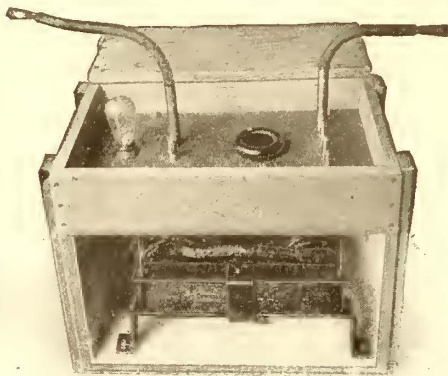
A NEW FORM of arc welding equipment for use with alternating current has been placed on the market by the Electric Arc Cutting & Welding Company, Newark, N. J. This consists essentially of an auto-transformer with taps from the various windings brought out and connected to plug contacts. Connections to these are made in a manner similar to the plugging connec-



TRANSFORMER MOUNTING

tion of a telephone switchboard. The control of the heat conditions of the arc is made by using a shunt in the magnetic circuit which can be readily moved by an adjustment handle. This feature of heat control maintains a constant power consumption automatically for any given setting. The theory is that constant heat requires constant power, that is, the heat in the arc is the product of both the current and voltage across it.

The following are some of the advantages claimed for this type of machine: (1) Light weight and ease in



PLUG CONTACTS AND ADJUSTMENT HANDLE

handling. The largest 60-cycle type weighs 250 lb. and can be handled by two men. (2) No moving parts. (3) Low maintenance cost. (4) High efficiency. The transformer is from 80 per cent to 90 per cent efficient and a pound of mild steel can be deposited by this machine with from $1\frac{1}{2}$ to $2\frac{1}{2}$ kw.-hr. (5) Machines are designed for use with any alternating-current power supply and for any voltage. (6) Positive heat control, preventing burning of the metal or making of imperfect welds through deficiency in heat. (7) High penetrative qualities for cutting.

Steel Hardening Process Makes Substitute for Manganese Specials

A PROCESS for hardening and carbonizing steel by the direct application of an oxy-acetylene flame is being used with success by electric railways on the Pacific Coast. The most important application of the process made by the United Railroads of San Francisco is its use on special work which has been built up in the shops and which is then substituted for manganese special work. Thus far, crossings so treated are reported as giving service equal to the more costly special steel.

A built-up crossing hardened by this process is said to cost about one-third as much as manganese special work. The oldest crossing on which this treatment has been used was until recently at Mission and Sixth Streets in San Francisco. It is still in good shape although it has had four years of moderately heavy service.

The process is based on the theory that iron or steel, when brought to a high temperature, will absorb the carbon and other elements necessary to hardening if solutions of salt, sulphate of copper and potassium are applied to the surface in the presence of a hot gas with high carbon content. The tempering is effected while the metal is still hot by chilling it suddenly with water.

The commercial type of oxy-acetylene apparatus is used for heating, and the particular results desired on the metal to be treated are secured by regulating the proportions of acetylene and oxygen supplied to the heating flame. The acetylene gas which carries the highest percentage of carbon has been found to give best results. The proportions of gas in the flame are not important during the initial stages of the heating; in fact, the combination which will produce the hottest flame is generally used. The need for regulation of the flame comes when the metal reaches a high heat and its "pores begin to open" and the affinity for carbon and other elements develops. In this condition the metal has been found to saturate itself with carbon if that element is available. In this "hardening flame" the acetylene gas predominates.

A distinction is made between this process and the common case-hardening methods. The new process is intended actually to alter the chemical composition of the metal treated and the tempering is done as a separate final step in the work. The temper can be made to any degree of hardness, it is claimed, and to any ordinary depth. In the ball of a rail the temper is usually made $\frac{3}{8}$ in. deep.

In treating crossings in place it is usually the practice to harden each rail for about 9 in. each side of the crossover. Then where each unit joins rail to rail a length of 6 in. to 9 in. is hardened to insure against breaks at this point. It is claimed that during hardening no expansion can occur in the bolts which might later result in a loosening of the crossing because the high heat is limited to the spot where hardening is desired.

Special work can be treated by this oxy-acetylene method for a cost of about 10 cents per square inch of surface treated. The process has been patented by Nelson H. Bray, San Francisco, Cal.

P. R. T. Acts on Epidemic

Effective Work Against the Influenza Done by the Company by Means of Car Signs and Preventive Measures

WHEN the so-called Spanish influenza, or epidemic influenza as it is now known in this country, made its appearance in Philadelphia late in September, the Philadelphia Rapid Transit Company was one of the first institutions in the city to realize the need for quick action. President T. E. Mitten at once took steps to insure that everything possible be done, not only to prevent the spread of the influenza among the company's employees but in co-operation with the Board of Health, Bureau of Police and Street Cleaning Departments of the city, the most vigorous precautions were taken to protect the traveling public.

Signs were posted in the windows of all the cars, urging the public to prevent the spread of germs by refraining from careless sneezing, coughing or expectorating, avoiding dust and keeping the ventilators

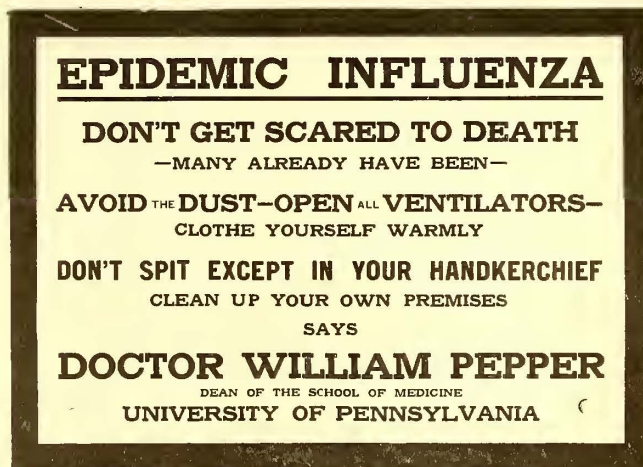
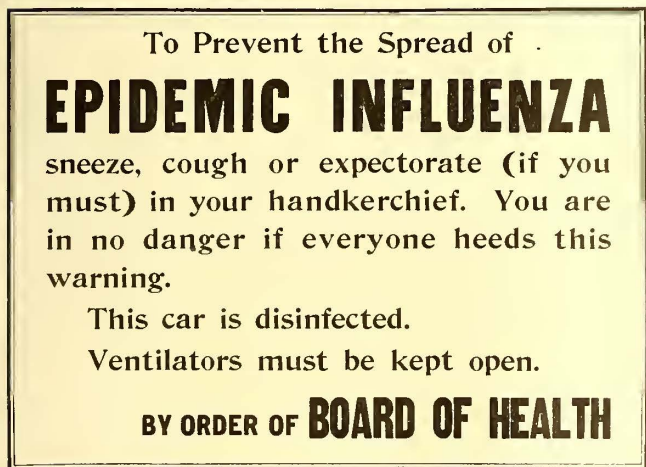
their handkerchiefs when necessary to sneeze, cough or expectorate. The need for rigid enforcement of the ordinance prohibiting spitting upon the cars and stations of the company was emphasized and employees were instructed to co-operate with the Police Department to this end.

The company also placed under the direction of the city street cleaning department, six car sprinklers and five wagon sprinklers, which were used continuously night and day for thoroughly flushing streets. These sprinklers also carried large banners reading "Avoid the Dust."

PREVENTIVE METHODS AMONG EMPLOYEES

Among its own employees, the management, by instruction and assistance, left no precaution untried to prevent the spread of the influenza and to relieve those employees afflicted with the disease.

By vigorous follow-up work including the institution of special automobile messenger service between New York and Philadelphia, a supply of a nasal oint-



SIGNS POSTED IN PHILADELPHIA CARS

open in the cars. The signs attracted favorable comment because of their effectiveness in quieting hysteria and unnecessary fear. A quotation from Doctor William Pepper, Dean of the School of Medicine, University of Pennsylvania reading "Do not get scared to death—many already have been" was used to special advantage in restoring confidence and cool judgment.

Another slogan "Sneeze, cough or expectorate (if you must) in your handkerchief," which has been used in other cities as well, met with quick response on the part of the public.

The company organized a special force of seventy-five men for the purpose of disinfecting all cars at the ends of the lines, with Fer-sul and carbolic acid. Instructions were issued to conductors to keep the car ventilators open and to air the car thoroughly at the lay-over end of the line by opening the doors and end windows of every car.

Motormen and conductors were also cautioned to use

ment with nasal applicator was obtained in sufficient quantities to distribute one of the nasal applicators and a tube of the compound to each of the 11,000 employees. The ointment known as V. E. M. is a cooling, soothing, mildly antiseptic combination of menthol and eucalyptol (Australian) in a pure hydro-carbon base. No charge was made to the employees for this, and its use was recommended as a preventive.

Flying squads of demonstrators, each consisting of a physician, a nurse and an assistant nurse, were sent out over the entire system, and at each carhouse demonstrations were given as to the method of using the nasal applicator and ointment. These squads at the same time took the opportunity to give talks to the employees on the care of health and the need for cleanliness and general precautionary and preventive measures.

The daily disinfecting of all telephones throughout the company's offices was another one of the preventive measures taken. A circular issue by the Metropolitan

Life Insurance Company on what and what not to do when the influenza makes its appearance was distributed to all employees.

The Philadelphia Rapid Transit Company did not lose so many of its employees through sickness as some of the other large institutions in the city and it was able to provide adequate service throughout the epidemic. At the peak of the contagion the largest number out because of sickness was 2100 from a total of about 11,000 employees. Of the 6000 motormen and conductors employed, the highest number reported sick on any one day was 1339.

The company on Sept. 1, 1918, had taken out a blanket policy with the Metropolitan Life Insurance Company insuring in the amount of \$1,000 the lives of all employees who became members of the Co-operative Association. Between Sept. 1, and Oct. 15, upwards of forty of these policies became payable because of death. The monthly dues are \$1 and none of these deceased employees had paid in more than \$2 as premiums. Nevertheless, the sum of \$1,000 was paid promptly to the beneficiary in each case.

The Health of Women in Railway Service

Woman Specialist in Brooklyn, After Observation of Months, Notes Marked General Improvement in Physical Condition

AN INTERVIEW is published in the October issue of the *B. R. T. Monthly* with Dr. Alice Bowman on the general health of the women conductors employed in Brooklyn. The *Monthly* explains that Dr. Bowman, who is a woman specialist of long experience, was retained by the company last March to pass upon the physical condition of women applicants for positions in the transportation departments. In connection with this work, and through her association, both professionally and personally, with women in the service, Dr. Bowman has had exceptional opportunities to observe any variations in the health of the women, whether for better or worse, that might occur. She spoke recently with great enthusiasm of the results of her observations. Her remarks, as quoted, follow:

"Speaking generally," she said, "I have observed a remarkable improvement in the spirits of the girls who have entered the transportation service—a marked change for the better in their mental attitude, a broadening in their outlook on life, and perceptible physical improvement in those cases where there was noticeable room for such improvement.

"For women who are strong enough to undertake such work, normally constituted women—and it is the purpose of our examination to eliminate those who are not—the work is not too hard. In the first place, once they have become accustomed to it, the girls really enjoy 'railroading.' There is action to it, motion, change of scene, new faces—the perpetual touch and go of humanity that sustains us all, more or less, and makes life worth the living. These elements compensate for the inevitable irritations that, in common with the men conductors and guards, the girls must encounter, and which are regarded simply as part of the day's work. There is, in short, very little of that monotony which so unfortunately characterizes the average work, whether

domestic or industrial, which is performed by the average woman.

"Specifically, my observations have led me to the conclusion that there is nothing in the strictly physical part of the work—the motion or lurching of the cars, the reaching for bell and register cord, the necessity of making their way through crowded cars—that is essentially injurious to the feminine organization. The tensioning of limbs and balancing of body that are called for in moving about in a moving car seemed to have a tendency to strengthen rather than weaken the muscles brought into play, and the open air, enjoyed almost continuously on the surface cars and part of the time on the Rapid Transit lines, brings results in clearer skin and brighter eyes and better lung capacity.

"Three cases that were especially convincing to me were those of girls who were in poor condition, although not sufficiently ill to be rejected on entering the company's service, but who showed really astonishing improvement after anywhere from six weeks to two months on the cars. One of these girls was suffering from anemia, the second from incipient lung trouble, and the third from a bad condition of her skin. All three not only showed great improvement, but all declared that the work on the cars agreed with them better than anything they had ever done before in their lives. All were on the job feeling fit the last time I saw them.

"Another girl I know who liked the work—a typical case, I think—gave it up because of some criticism on the part of her friends, and returned to a factory where she had been working before. It was not long, however, before she was back asking for reinstatement. She declared that the factory work seemed unbearable after 'railroading,' and that she had not felt nearly so well. From then on, as she expressed it, the cars were good enough for her. Incidentally, her husband was in France, and she was supporting her little boy, four years old, and living with her parents. By working extra when she felt like it, she was making regularly from \$18 to \$24 a week."

Electrolysis of Condenser Tubes

A RECENT issue of *London Engineering* contains the results of an analysis of two cases of condenser tube corrosion made by the Material Prüfungsamt near Berlin, Germany. One brass originally contained the following percentages of metals: Copper, 70.5; zinc, 28.8; lead, 0.21; tin, 0.28; iron, 0.08. The corroded alloy contained: Copper, 97.4; zinc, 0.69; lead, 0.06; tin, 0.46; iron, 0.08. In the other case the original analysis yielded the following percentages: Copper, 59.2; zinc, 40.37; no tin; iron, 0.32; lead, 0.24. The corroded alloy had the composition: Copper, 97.76; zinc, 1.29; no tin; iron, 0.10; lead, 0.05.

In both cases the corrosion had bleached out the zinc and had also diminished the small percentage of lead, while there was little or no change in the iron. That the ordinary water of the supply main may give rise to considerable differences of electric potential is shown by the water of Charlottenburg, a suburb of Berlin. In this water couples of zinc and brass acquire a potential difference of 0.888 volt. In view of the actual wide uses of substitutes for metals and alloys the Prussian government has drawn attention to the danger of electrolysis.

Bay State Asks 10-Cent City Fare

Suburban Lines Divided Into Zones of Two Miles With Fare of 5-Cent and 10-Cent Minimum— Reduced Rate Tickets to Be Abolished

ON OCT. 11 the Bay State Street Railway of Boston asked for an increase in fares with abolition of all reduced-rate tickets including those sold for off-peak hours. The petition requested authority to put the new fares in operation on Nov. 11. Presumably the Public Service Commission will grant hearings to consider the petition and to hear any opposition.

Briefly, the proposed plan divides the cities into "city zones," approximately $4\frac{1}{2}$ to 5 miles in diameter, in which the fare will be 10 cents, and the interurban lines into 2-mile zones, in which the fare will be 5 cents a zone with a 10-cent minimum fare. The fare schedule, which was adopted June 24, has much smaller city zones, averaging perhaps $2\frac{1}{2}$ to 3 miles in diameter with a 6-cent cash fare, and outer zones of about 1 mile in

use. The company's present schedule has generally been criticised as being too complicated. The revenue has been unsatisfactory, and it is hoped by the adoption of the proposed schedule greatly to improve the situation.

Where the Bay State lines are in competition with the Boston Elevated Railway, as in Chelsea and Hyde Park, the city zone fare unit is to be established at 7 cents, as in Boston.

The explanation of the plan given to the press by Receiver Wallace B. Donham follows:

STATEMENT OF RECEIVER DONHAM

The Bay State Street Railway Company must have a large increase in revenue immediately, and I am filing a new fare schedule to-day. It has been my intention not to file with the Public Service Commission another tariff revising the fares but to leave this problem to the trustees who are appointed by the Governor to manage the property under the legislation passed last winter. This however turned out to be impossible for several reasons.

In the first place, financial conditions arising out of the war have made it so difficult to raise money, particularly for street railways, that it has not yet been possible to accomplish a reorganization of the property under the public control act. Such a reorganization necessitates raising several millions of dollars. Trustees could not therefore take over the management of the property, and the receivership could not be brought to an end.

In the meantime, the labor situation has developed in such a way as to bring about a crisis, requiring an immediate readjustment of revenue. The Bay State Street Railway employees are to-day getting less compensation than the employees on street railways such as the Springfield Street Railway, Worcester Consolidated and Middlesex & Boston, and very much less than the employees of the Boston Elevated.

It is impossible that this situation should continue long, and I, as receiver, have no funds with which to pay higher wages. If wages are not raised the property cannot continuously be operated because it will be impossible to get men to operate the cars. If wages were raised without an increase in revenue, the property could not be operated because the United States Court which appointed the receiver would not allow me to borrow money for the purpose of paying operating expenses.

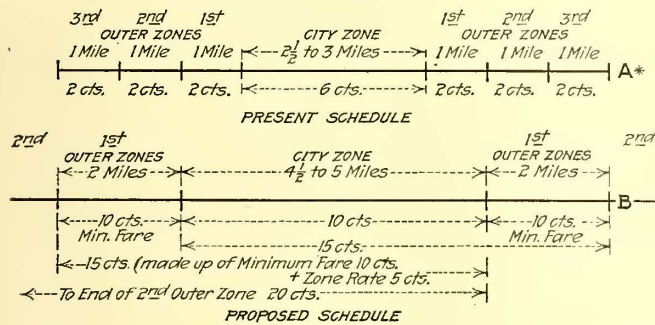
Nothing else therefore is possible but an increase in fares and in order to accomplish the result, this increase in fares must be substantial.

The schedule under which the company has been operating this summer has not proved satisfactory to the public or to the employees of the road, and has generally been criticized because it is too complicated. The reduced rate city tickets have not built up traffic and the city fares were not therefore on the average increased appreciably. The city revenue has therefore been unsatisfactory.

The revised schedule filed to-day is drawn with a view to eliminating all possible complications and getting the system on a simple, readily understood and workable system of fares. The city areas are made larger than the city areas in the tariff operated this summer and the country zones are made approximately two miles in length instead of one mile in length. The whole system is then put upon a uniform basis of fares with a 10-cent minimum fare, good in the cities with universal transfers and in the outlying districts good for two zones or any part of two zones with additional fares of 5 cents a zone for rides extending outside the cities or more than two zones in the country. In general, reduced rate city, suburban and workingmen's tickets are abolished.

The present Hyde Park city zone is left as it now exists and the unit fare is made 7 cents because of its proximity to the elevated system. Similarly in the Chelsea system to Scollay Square which is within the limits of the Boston elevated territory, the fare will be by later tariff placed on the same basis as the elevated fare.

Increases in the rates of electric railway fare are not confined to the United States. In Japan the Imperial Government Railway recently made a decided advance which is expected to have a widespread influence in the movement for higher fares throughout the empire.



CASH FARES, PRESENT AND PROPOSED SCHEDULES ON BAY STATE RAILWAY

The upper diagram shows present cash fares, but certain reduced-rate tickets are sold. The lower diagram shows the proposed schedule of fares. Under this schedule all reduced-rate tickets, except school tickets, are eliminated.

Note: On some of the lines in the present schedule the outer zone rates are $2\frac{1}{2}$ cents and 3 cents per mile.

length with fares at the rate of 2 cents per mile. The accompanying diagram shows the general plan.

The proposed schedule also calls for the abolition on all reduced rate tickets with the exception of those sold to school children. The company believes that the use of the nickel and its multiple, the dime, will prove of great advantage from the point of view of simplifying the collection, handling and accounting of its revenue.

In increasing the so-called city zones these zones have in general been increased by taking in the first zone on each side of the former urban zone limit. Beyond the new urban zone limit the zones have practically been doubled in length in comparison with the previous zones. Within the city zones, universal transfers will be given.

The principal reduced-rate tickets which will be eliminated are: All-day city tickets, six for 30 cents; mid-day or off-peak city tickets, six for 25 cents; all-day suburban tickets, seven for 50 cents (good from the city zone to the limit of the first outer zone); mid-day or off-peak suburban tickets, four for 25 cents (good from the city zone to the limit of the first outer zone).

All four of these present reduced-rate tickets are good only to the traffic center.

The company's experience has been that the reduced-rate tickets have not built up traffic, and the city fares were not on the average increased appreciably by their

AMERICAN ASSOCIATION NEWS

War Board Recommends Two Types of Cars to Housing Bureau

IN RESPONSE to the Aug. 19 invitation of Otto M. Eidlitz, director of the United States Bureau of Industrial Housing and Transportation, that the War Board of the American Electric Railway Association suggest a car suitable for use under average city conditions on standard gage track, the majority of the committee appointed for that purpose has recommended two types, "A" and "B," for its consideration.

Type "A" is arranged for both prepayment and side-door pay-as-you-leave operation, with one or two operators on the car. It is 47 ft. 9 in. over all. Type "B" car, which is 47 ft. long, has doors at all corners and is arranged for either one-man or two-man operation. Both cars are designed for train service if desired. The specifications were drawn up by C. O. Birney in co-operation with car builders, electrical manufacturers and others.

As some of the members of the committee felt that wider doors and drop platforms would be more desirable for heavy service conditions, it was moved to appoint a new sub-committee with H. H. Adams as chairman to prepare comparative plans and specifications. The details of membership of this committee were left to the discretion of E. C. Faber, manager of the War Board.

A resolution of appreciation and thanks, proposed by J. H. Hanna, was voted. C. O. Birney and his aides for their thorough work in so short a period. A similar motion was proposed by Mr. Faber and carried at the meeting of the sub-committee (Messrs. Lambert, Layng, Birney, Seely and Wells) on Monday, Oct. 14.

The committee members present at the meeting were E. C. Faber, J. H. Hanna, John Lindall, H. H. Adams, M. B. Lambert, J. F. Layng, C. O. Birney and Gardner F. Wells, the latter representing the Bureau of Housing and Transportation. There were also present as guests of the committee J. C. Thirlwall and Walter Jackson.

Pamphlet Gives Testimony on Utility Taxation

THE national committee on public utility conditions, with which the American Electric Railway War Board is associated, has published in pamphlet form a transcript of the testimony given on Sept. 14 by Philip H. Gadsden, chairman of the committee, before the committee on finance, United States Senate, on the war revenue bill. Mr. Gadsden's testimony was a plea for the reduction of the tax of 12 per cent and 18 per cent on net earnings. During this testimony Mr. Gadsden pointed out that the War Finance Corporation in several cases had required companies to discontinue paying dividends when it loaned the money to them, whereas the bill required the companies to pay 6 per cent more on earnings which are not paid out in the form of dividends. In other words, the railways were penalized by the taxing authorities for doing what they were instructed to do by the War Finance Corporation.

LETTER TO THE EDITORS

Further Objections to Proposed Daylight Saving Extension

NEW YORK DAYLIGHT SAVING COMMITTEE

NEW YORK, Oct. 14, 1918.

To the Editors:

In addition to the arguments against the proposed winter extension of daylight saving quoted in the admirable editorial in your issue of Sept 21, there are the following objections:

1. We have no precedent of successful experience of other countries to base an action which, on the very face of it, seems ridiculous, namely to try to save daylight *before* daylight in winter short days.

2. It would throw our time out of uniformity with European time.

3. It would arouse such opposition as would result in killing the summer movement which has been so beneficial.

MARCUS M. MARKS,

President National and New York
Daylight Saving Associations.

Canadian Association Elects Officers

THE Canadian Electric Railway Association met at Toronto, Ontario, on Sept. 17 and 18, with the president, C. L. Wilson, assistant manager Toronto & York Radial Railway, in the chair. On account of war conditions, the usual practice of having papers read and discussed was omitted, and the greater part of the time was devoted to the reading and discussion of the honorary secretary's report on the association's work for the past year, and the discussion of other matters vitally affecting all electric railway companies, such as the necessity for securing increased revenues, etc.

The following were unanimously elected as officers: President, A. Eastman, vice-president and general manager Windsor, Essex & Lake Shore Rapid Railway; vice-president, A. Gaboury, superintendent Montreal Tramways; honorary secretary-treasurer, Acton Burrows, managing director *Canadian Railway & Marine World*; executive committee: E. P. Coleman, general manager Dominion Power & Transmission Company; James D. Fraser, director and secretary-treasurer Ottawa Electric Railway; G. Gordon Gale, vice-president and general manager Hull Electric Company; H. M. Hopper, general manager New Brunswick Power Company; George Kidd, general manager British Columbia Electric Railway; M. W. Kirkwood, general manager Grand River Railway; J. S. Mackenzie, treasurer Winnipeg Electric Railway; R. M. Reade, superintendent city and Quebec County divisions, Quebec Railway, Light & Power Company; C. L. Wilson, assistant manager Toronto & York Radial Railway; assistant secretary, A. A. Burrows, business manager *Canadian Railway & Marine World*.

The American Society of Mechanical Engineers has issued a roll of honor of members in national service. Of the 9141 members of the society 933, or more than 10 per cent, have responded to the country's call.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

No One-Man Makeshifts

Massachusetts Commission Insists that One-Man Cars Must Contain Safety Features

In a decision dated Oct. 10 the Public Service Commission of Massachusetts dismissed a petition of the Connecticut Valley Street Railway for approval of type and use of one-man cars upon its Millers Falls division in the town of Montague and upon its Conway Street line in the town of Greenfield.

WANTED TO USE OLD CARS

The company desired to operate the cars now in use on the Millers Falls division with one man without remodeling, merely closing the rear doors and requiring passengers to enter and leave by the front end. The company maintained that it does not feel that it ought to go to the expense of furnishing new cars for this division under existing conditions. It was a part of the company's plan to provide two men on the morning trip and the late afternoon trip, on which workmen are taken to Millers Falls, and vice versa at night, by utilizing as a spare conductor one of the passengers who is an employee of the railway.

The commission is of the opinion that the use of old and inappropriate equipment for one-man service on such lines is apt to prove disappointing to both patrons and company. The chief question in the case is that of safety of operation, as the traffic is light except when the company plans to provide two men. The operating conditions on a portion of the route, at the Turners Falls end, are unfavorable, in the commission's view, on account of the presence of a long and comparatively steep grade with a 90-deg. turn about 600 ft. from the bottom. The decision says, in closing:

WOULD ENCOURAGE ONE-MAN CARS

"The commission is fully aware of the financial straits in which many railways now find themselves, under war-time prices and wages. It is our belief that one-man operation ought to be encouraged, and the commission is ready to approve the use by the petitioner upon its Millers Falls division of new one-man cars of modern design, or of old cars properly reconstructed for such use. It is possible, indeed, that all the special devices above described (the usual complete safety and automatic features of the safety car) would not be necessary, and any plans for simplified reconstruction which the company may desire to submit will be received and reviewed without prejudice.

"It is our information that reasonably prompt deliveries can be expected, either of new equipment or of apparatus necessary for reconstruction purposes. After careful consideration, however, the commission is not willing to approve the mere elimination of the conductor, without any adaptation of the existing cars for one-man operation. We reach this conclusion not only because of the recently demonstrated danger of operation upon the line in question, but because of a belief that it would not be a desirable precedent to set.

"The companies in other parts of the country which have derived financial advantage from one-man operation have gained not only from the saving of labor, but also, and in perhaps greater degree, from the improvement of service which it has made possible. There may be lines where the make-shift arrangement proposed by the petitioner may reasonably be permitted, but in the great majority of cases it would, in our judgment, be inconsistent with both the public and the company's interest. The petition is dismissed."

Interurban Strike Settled

The strike of platform men employed on the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., on its interurban lines between Erie, Pa., and Buffalo, declared at 4 a.m. on Oct. 3, was called off two days later when George E. Bullock, receiver for the company, agreed to submit the wage question to the War Labor Board for a decision. The men had been receiving 40 cents an hour. They demand an increase of 8 cents an hour. An offer of 45 cents an hour made by Mr. Bullock was rejected.

Although the strike was called off by the trainmen on Oct. 5, the company was unable at once to operate cars from the Buffalo city line to its Main Street terminal, a distance of almost 5 miles, because of the strike in the power houses of the International Railway, Buffalo, which supplies the company with power. This situation has been remedied and now the company is operating cars along its entire route. For a short time after the strike was settled, no cars were operated between Buffalo and Dunkirk because Receiver Bullock said the traffic did not warrant the service. The Buffalo & Lake Erie Traction Company is now the only interurban line entering Buffalo. No cars of the Buffalo, Lockport & Rochester line operate over the International lines between the Lockport city line and the Buffalo interurban terminal. Buffalo, Lockport & Rochester cars stop at the Lockport city line.

War Labor Board on Rates

Indicates That Where Labor Opposes Fare Advances It Will Nullify Wage Awards

Plain indication was given on Oct. 8 by the National War Labor Board that in cases where organized labor opposes advanced electric railway fares recommended by the board in connection with increased wages awarded to employees of public utility companies, the entire award will be suspended.

THE BOARD'S LETTER

In this connection the board made public a letter to John R. Alpine, acting president of the American Federation of Labor, calling his attention to the fact that labor organizations in New Orleans were planning to oppose increased fares recommended by the board when it granted an increase to the railway employees there. The letter of Messrs. Taft and Walsh, joint chairmen of the board, follows:

"We are advised that an organized labor meeting is to be called in New Orleans to protest against a recommendation made by us as arbitrators in the issue made by complaint of street railway employees of the Amalgamated Association against the New Orleans Railway & Light Company.

"In that case we made a very substantial increase in the wages of platform men, equal to approximately 70 per cent, and in order that the company might have the money with which to meet this very great increase in its operating expenses we recommended to the local municipal authorities that there be made an adequate increase in the rates of fare. This matter was brought to the attention of the Municipal Council on the application of the railway and in the face of our award was resisted by the president of the Local Amalgamated Association and by other representatives of the local organizations affiliated with the American Federation of Labor.

MAY SUSPEND AWARD

"We are advised that on Sunday, Oct. 6, a meeting of organized labor is to be called to protest against compliance with our recommendations as to the increase in fare. If this action is taken by the labor organizations it would seem that in justice we shall be compelled to suspend the entire award, including the increase in wages, pending a rehearing of this matter which we now have under advisement.

"We trust that you will take whatever action you may be advised will fit the situation."

The rate matter is referred to on page 717 of this issue.

Boston Accepts Wage Award

Trustees Recognize Ineffectiveness of Increase in Unit Fare and Start Zone Fare Studies—Messrs. Richey and Witt Retained

The board of trustees of the Boston (Mass.) Elevated Railway at a regular meeting on Oct. 8 accepted the award of Messrs. Taft and Walsh on the application of the employees for increased wages. It is understood that the local carmen's union has also accepted the award.

WAGE INCREASE \$3,000,000 A YEAR

Officials of the company estimate that the increase in the rate of wages granted by this action of the War Labor Board will be in the neighborhood of \$3,000,000 per annum. With the adjustments in the wages of other classes of employees which are bound to follow, and which are in principle accepted by the board of trustees, the total increase is likely to exceed the sum named.

Now that the award of wages has been made, and as soon as the application of the same can be figured out, it will be the policy of the board of trustees to make regular monthly publications, beginning as soon as possible with the figures for July, August and September, of all receipts and expenses incident to the operation of the property. In this connection Stanley R. Miller, of the trustees for the public operation of the railway, has made the following statement:

"It is obvious that with the disappointing increase in revenue which has followed the increase in the fare unit, the showing for the first quarter will be very poor. In particular, the statement for the month of July is certain to be almost disastrously bad, because in that month were some unusual expenses while the fare increase did not become effective until Aug. 1.

"The trustees are confronted with an extremely difficult and serious problem. They are required by law to establish rates of fare sufficient to meet the cost of providing service. When they assumed office it was very evident that a crisis was at hand and quick action was imperative. Acting on the best advice then obtainable, the fare unit was increased from 5 cents to 7 cents, the increase taking effect on Aug. 1. The effect of that increase upon the actual revenue received has already indicated the necessity of some further very radical action in the matter either of the rate of fare or the entire basis of fares. It is obvious that there must be a very large increase in the company's revenue.

TOTAL NEW EXPENSES \$7,500,000

"Speaking roughly, the trustees are confronted with new expenses and financial requirements chargeable against the cost of operation, expressly required by the statute, amounting to \$7,500,000. This sum is made up of the \$3,000,000 wage increase, an item of additional depreciation of substantially \$1,600,000, an additional rental

charge on account of the Dorchester subway of \$400,000, increased cost of coal \$500,000, interest and dividend charges upon recent issues of bonds and the new preferred stock of the Boston Elevated Railway of \$300,000, 5 per cent dividend upon the common stock of the Boston Elevated Railway of about \$1,200,000.

"The increase in the fare unit from 5 cents to 7 cents on Aug. 1 was followed by an increase in revenue of \$368,000 for the month of August, which was 23.79 per cent more than the revenue in August, 1917.

"In September the revenue increase was \$186,000, or 12.15 per cent. For the first ten days of October there has been an actual decrease in revenue as compared with the same period of 1917. It should be pointed out that the low rate of revenue increase in September and the actual decrease suffered in October have undoubtedly been due in a considerable measure to the epidemic of influenza recently prevalent.

"The trustees have no option under the law but to establish rates of fare of some kind that will, in their judg-

and thereafter. The wage scales in cents per hour are compared in the accompanying table.

In the 1916 agreement column, the established scale after the first year ranged between the rates shown, extending from the second to the fifth year inclusive, subsequent rates being those of the fifth year. The War Labor Board's award wipes out four of the five years of the sliding scale agreed upon between the company and the union, and scheduled to run from 1916-1919. The wages in the 1916 column are those the company was paying in 1918. By that agreement there were progressive increases from year to year. The actual rates paid in 1916 are not shown, the comparison being merely between the 1918 rates and the award of the War Labor Board. The war compensation added to the rates in the second column, 2 cents an hour, was awarded by Henry B. Endicott in 1918 in a special arbitration between the company and the union. This flat increase when added to the second column gives the actual rates the employees tabulated were receiving prior to the War Labor Board's award.

The wages of employees other than those fixed above were increased by 28 per cent, in the board's award, and in any case where this percentage in-

	Award of War Labor Board	1918 Wage Scale by 1916 Agreement, Established Scale	Total, Incl. War Compensation of 2 Cents per Hour
Surface lines, motormen and conductors:			
First three months' service.....	43	30.25	32.25
Next nine months' service.....	46	30.5	32.5
Thereafter.....	48	31.75-35.5	33.75-37.5
Rapid transit lines, motormen:			
First three months' service.....	45	33.75	35.75
Next nine months' service.....	48	33.75	35.75
Thereafter.....	50	34.5-37.5	36.5-39.5
Rapid transit lines, guards:			
First three months' service.....	43	29	31
Next nine months' service.....	43.75	29	31
Thereafter.....	44.5	30.5-32.00	32.5-34.00
Rapid transit lines, brakemen:			
First three months' service.....	40	25.5	27.5
Next nine months' service.....	41	25.5	27.5
Thereafter.....	42.5	26.75-28.25	28.25-30.25

ment, meet the cost of service. Any deficit which results if such cost of service is not covered is in the first instance reimbursed to the company by the Commonwealth, and later pro-rated by the Commonwealth on the cities and towns served by the elevated. The question, therefore, is a very intimate one for every taxpayer of the Metropolitan District.

"Recognizing the evident ineffectiveness of the mere increase in the fare unit, the trustees have inaugurated searching investigations as to various possible other means of fare collections. It is in the mind of everybody that the zone system of fare charges should be carefully considered in its possible application to the Boston situation. Professor Richey has already been giving considerable time to this question, and Peter Witt, Cleveland, Ohio, will come to Boston to make an exhaustive study and recommendations."

The wage rates just referred to are fixed for the period of the war only. The Boston five-year graduated scale is cut down to a graduated scale covering the first three months, next nine months

and did not bring the wage up to a minimum of 42½ cents an hour, that minimum was established by the War Labor Board in the case of all adult male employees and of women employed in the same classification as men, the women receiving equal pay for equal work. Two instances of the striking increase of pay granted to miscellaneous employees follow: Porters received 22½ cents an hour, and now receive 42½; car cleaners received 26 cents an hour, and now receive 42½. This is a weekly increase of \$14 for porters and of \$10.23 for cleaners.

Another important recommendation of the board was that for the duration of the war the agreement as to schedule runs on both the surface and the rapid transit lines be modified so that 55 per cent instead of 70 per cent of the schedule runs are to be laid out with outside time not to exceed eleven hours. The award is dated Oct. 2, 1918, and takes effect as of June 15, 1918, continuing for the duration of the war with a provision for reopening by either party at six months' intervals, beginning on April 1, 1919.

St. Louis Franchise Settlement Rejected

New Ordinance Not Sufficiently Flexible, Says Company President, Who Sees Breakdown of Commission Regulation

The franchise settlement ordinance of April 10 has been rejected by the United Railways, St. Louis, Mo. This was made known by the company through a letter addressed on Oct. 8 by President Richard McCulloch of the company to Mayor Kiel. The reasons for rejection as summarized by President McCulloch are as follows:

CONDITIONS HAVE CHANGED

1. Fundamental conditions have so changed that the company confesses its inability to give St. Louis and contiguous territory adequate transportation facilities under the ordinance of April 10.

2. The growth of government ownership since the war began indicates that every facility for the public operation or ownership of these railways should be provided in any settlement ordinance; the present ordinance is not sufficiently flexible in these respects.

3. Street railway service should be sold at cost. Lowest cost will result from a public guarantee of integrity of investment and interest thereon; the present ordinance does not permit this result.

4. An equitable adjustment of the company's capitalization cannot be made under this ordinance.

The ordinance known as the "compromise ordinance," affecting the relations of the city of St. Louis and the United Railways, after being passed by the Board of Aldermen, was signed by the Mayor on April 10. The conference and hearings on the ordinance were begun in 1916, and have been reviewed in the *ELECTRIC RAILWAY JOURNAL*. In his letter to the Mayor President McCulloch said in part:

"This country had not at that time (the start of negotiations) entered into the world war. Regulation of street railway rates by commissions was then thought practicable and sufficiently responsive to moderate changes in expenses and cost of service to meet all reasonable requirements. Public ownership appeared many years off and an issue to conjure with rather than to consider seriously.

CONCESSIONS BURDENSOME

"In the progress of the settlement conferences, representatives of the railway conceded many matters which they believed at the time to be of importance. We felt that we were justified in traveling far along the road required to meet your views and those of your associates in the administration to the end that harmony might finally result.

"While the ordinance was in the Board of Aldermen fundamental conditions began to show changes visible even to the layman. Prices of all commodities showed a heavy upward trend. With the rise of commodities there

came increases in cost of living. Fairness to labor required that wages be largely increased. With the general rise in commodity prices and wage level, there came the increased cost of capital. Interest rates have gone so high that little capital for the extension of our railway system could be obtained on the basis contemplated as fair at the time that the ordinance was first discussed. In the light of present conditions and those likely to obtain during the war readjustment period, it now appears that we would have misled not only ourselves but also your administration and the public with respect to improved street railway facilities in St. Louis and contiguous territory. The ordinance of April 10 could not have accomplished its expected purpose.

COMMISSION REGULATION HAS FAILED

"In Massachusetts, where regulation of street railways has been practiced the longest, it has been determined that commission regulation failed. It cannot meet the crisis of rapidly changing conditions. It has proved satisfactory neither to the public nor to the investors. It failed to provide the facilities to which the public believed they were entitled. It failed to give to the investors that certainty of return which they were led to believe was rightfully theirs because of the State supervision of issue of securities and the limitation of profits to mere legal interest rates.

"The operation of the steam railroads and the lines of wire communication by the federal government has been made necessary by the war. There, too, in the case of the railroads regulation by commission failed to carry them over the crisis. There are many thoughtful people who see the necessity of public ownership of municipal and intercity public utilities. The public will decide this question and decide it right. But the franchise of April 10, 1918, did not make it easy or convenient for the public to assume the operation either with or without public ownership of the railways. In this respect, the ordinance was defective judged from present-day standards and would likely have been found to be unsatisfactory both to the public and to the company.

"Public utilities have suffered large losses in earnings since the war began. Variation in earning power makes an industry hazardous from the investors' viewpoint. Certainty of return makes an industry stable. Low interest rates are associated with stable earnings, and high interest rates with hazardous industries. Where the nation, state or municipality, guarantees the return, capital can be cheaply obtained. The best present-day thought is that the making of such guarantees in respect of public utilities is a proper function of government.

"If for the time the public wishes the street railways in St. Louis and contiguous territory to be privately owned and operated under a service-at-cost plan, then any street railway settlement ordinance should provide for making the cost a minimum. This can be done only by arranging for the public guarantee of operating expenses, taxes, allowances for future replacements and a return upon the money fairly invested in the enterprise. On no other basis could the public expect good service. And on no other basis would the company be justified in entering into new arrangements which involved an undertaking to expand the present facilities. The financial structure of the company cannot be permanently adjusted under the ordinance of April 10.

A MODERN SETTLEMENT NECESSARY

"For these reasons, the United Railways respectfully advises you that the ordinance of April 10 cannot be accepted by the company, and is hereby declined.

"We think that we are cognizant of the transportation requirements of the city of St. Louis and contiguous territory. We know that the present disturbed conditions are satisfactory neither to the public nor to the investors who have provided such facilities as you now enjoy. The best interests of a Greater St. Louis require that a modern settlement be reached involving conditions that will be readily approved by the public. We stand ready to discuss the subject and continue the discussion until a fair arrangement has been concluded."

Status of St. Louis Wage Question

The United Railways, St. Louis, Mo., has refused to accede to a proposal made by the local union that the wage scale now in existence be abrogated and that hearing be held before the War Labor Board to determine if the men are entitled to an increase in salary. The present wage scale of the company was agreed upon by both sides June 1, when, at a conference of the company officials and the officials of the newly formed union, the strike was formally settled. More than a month ago the employees through their union asked that the wage question be left to the War Labor Board. This request was rejected. Following this refusal the employees appealed to the War Labor Board in a letter from A. O. Piant, president of the union. The secretary of the War Labor Board then mailed a copy of this letter to the United Railways and asked if the company would submit to the conference suggested. The reply of the company, while it does not refuse to arrange a conference, sets forth the reasons why the company cannot entertain a proposition dealing with any increase in salary. It suggests that the employees make their request to the Public Service Commission at the time that the petition of the company for another increase in fares is heard.

Buffalo Strike Unsettled

Company Making Effort to Operate,
But Mayor Seems Determined to
Force Receivership

Three plans are being advanced to end the strike of employees of the International Railway, Buffalo, N. Y., and thus bring about a complete resumption of service in Buffalo, Niagara Falls and Lockport and on the Olcott division of the International lines. They are all suggested by members of the City Council. Two have the approval of the International Railway while one is being opposed by the company.

The plan opposed by the company is that being carried out by the Mayor and one member of the City Council. Justice Louis B. Marcus of the Supreme Court of Erie County issued a writ of mandamus directing the company to start the operation of cars on all of its lines at noon on Oct. 19. The judge said that failure to operate cars would force him to apply to the United States Court for the Western District of New York for the appointment of a receiver to operate the line. An appeal was taken to the Appellate Division of the Supreme Court at Rochester and a stay was granted. The Appellate Division affirmed the decision of Justice Marcus and a further appeal has been taken by the company to the New York State Court of Appeals. Arguments were set to be heard in Albany on Oct. 18. If the Court of Appeals affirms the judgment of the lower court, the case may be carried to the United States Supreme Court.

Despite the efforts of every daily newspaper, the Chamber of Commerce, the Retail Merchants' Association and other commercial organizations to have the Council enact an emergency ordinance which would end the strike at once, the Mayor says he will hold out indefinitely.

The two plans for a settlement which have the approval of three members of the City Council and officials of the railway provide for partial reorganization of the company and a 6-cent fare. The first plan provides for the enactment by the City Council of an emergency resolution allowing the company to collect a 6-cent fare from passengers pending an investigation into what should be a reasonable rate of fare by the Public Service Commission of the Second District and the giving of rebate slips for 1-cent to all passengers who pay the 6-cent fare. These rebate slips would allow passengers to get a rebate of 1 cent if the State Public Service Board holds that a 5-cent fare is just and equitable.

This plan also provides for the appointment of additional members to the board of directors of the company by the City Council. Under this plan, which has the approval of E. G. Connette, president of the International Railway, and the directors, the strikers would receive the wage award of the War Labor Board and they would also be guaranteed by the company the back pay to June 1, computed on the basis

of the award of the War Labor Board. Approval of this plan by the Council would not be subject to a referendum of the voters at a special or general election in the same manner as the first 6-cent fare resolution enacted by the Council and later rejected by the voters.

The second plan, which also has the approval of the company and is favored by three members of the City Council, likewise provides for an emergency 6-cent fare ordinance with a 1-cent rebate slip, but other provisions differ from the first plan. This plan provides for a board of three to operate the road, each to receive a salary of \$1,000 a month. One of these commissioners would be named by the city; the second by a Supreme Court justice and the third by the railway. This plan would remain in force until May 1, 1920. The Milburn agreement, under which the company now operates, would be in effect again after this date with all of its previous fare and franchise restrictions.

The company has made an effort to operate cars. In fact, it has been operating cars since the strike to the extent that it could secure men for the purpose.

P. R. T. Urges Employees to Buy Liberty Bonds

T. E. Mitten, president of the Philadelphia Rapid Transit Company, on Oct. 1 sent to all employees of the company a letter reading as follows:

The average pay of this company's employees has been advanced over 90 per cent since June, 1913.

The average cost of living has here been increased 66 per cent since June, 1913. (Cost of living, as published by the Bureau of Labor Statistics.)

Secretary McAdoo is quoted as saying that "Those who spend everything they earn are not only living in a fool's paradise, but they are doing a grievous injury to their country. They are living in a fool's paradise because the same degree of prosperity cannot be expected to continue upon the return of peace."

For your own sake and the sake of the future of your family—**SAVE NOW.**

For the sake of your country in its hour of need, invest your savings in Liberty Bonds. The government wants all the money we can spare to help win the war, and will pay us 4½ per cent interest.

Those of us who stay at home and earn these good wages must now come forward and do our part.

The management earnestly requests that you sign the inclosed order on the treasurer for 10 per cent of your pay for the six months beginning Oct. 12, and return this order in the inclosed envelope. The result will be a subscription of over \$500,000 to the Fourth Liberty Loan, and a very substantial addition to your savings account.

Let us all now sign up and show our patriotism in this unmistakable way.

On Oct. 13 a second letter was sent, explaining that up to that time some 3000 subscriptions had been received. It stated, however, that for those who desired to adopt such a plan the payments for the bonds need be only 5 per cent rather than 10 per cent of the wages per month, the payments to continue over a year instead of six months. This plan, it was explained, would apply to all applications filed unless the treasurer was otherwise directed in writing.

The men have responded very generously with their subscriptions.

Seattle Sale Attacked

Municipal Ownership Advocate Sees
City Piling Up Deficit of \$1,590,000
Annually on Present Basis

Oliver T. Erickson, one of the strongest municipal ownership advocates in the City Council of Seattle, Wash., and the backer and supporter of the present municipal railway in Seattle, has attacked the city's pending deal to pay \$15,000,000 for the railway lines of the Puget Sound Traction, Light & Power Company. Mr. Erickson after investigation expresses the belief that \$15,000,000 is more than the property is worth. He fears that an effort to operate the system on the basis of the purchase price so far discussed may prove a "black eye" for municipal ownership. He states that on a 5-cent fare basis there is a possibility of a deficit of \$1,590,794 annually. When the negotiations for the property were under way, Mr. Erickson was out of the city.

SKEPTICAL ABOUT INCREASED FARES

Mr. Erickson says the vital question is not what the lines cost, or what it would cost to duplicate them, but whether the city can take them over on such a valuation and operate without piling up losses. He says:

"What may be done with fares above 5 cents is pre-mathematical. Increasing revenue by increasing fares has a very limited range, due mostly to the advent of the automobile. The \$750,000 interest charge, of course, would begin to decrease after five years, and other expenses may decrease, but that leaves plenty of room for speculation."

In replying to Councilman Erickson's statements, Mayor Ole Hanson says that he is preparing a detailed reply to show that the city is making a good deal in buying the traction property. Thomas F. Murphine, Superintendent of Public Utilities, is preparing a statement to combat Mr. Erickson's figures.

Due to the time required in checking up the traction properties, city officials stated that it would probably be Oct. 15 before the accountants at work on the books had completed their work.

Walter F. Meier, Corporation Counsel, has been instructed by the City Council to prepare an ordinance authorizing the issuance of the bonds, and the formal transfer of the property. The bonds will be for twenty years and bear interest at 5 per cent.

SUBURBAN LINE OFFERED

The Seattle & Rainier Valley Railway recently made its first definite offer to sell the line to the city of Seattle. The property was tendered to the city for the sum of approximately \$1,600,000. Acceptance of the offer, however, has not yet been determined upon. President Sampsell presented a statement showing that the company has outstanding securities of \$1,755,443, but states that he is willing to turn the property over to the city at a sum approximating \$1,650,000, accepting 5 per cent bonds in payment.

Chicago Staggers Hours

Follows the Lead of Washington and New York in Attempt to Spread the Rush-Hour Peak

The spread of Spanish influenza in Chicago, Ill., led to the prohibition of smoking on cars during the week ended Oct. 12 and is likely to bring about the staggered-hour plan of opening and closing a number of large establishments.

At a meeting of national, state and city members of the influenza commission on Oct. 14, the prohibition of smoking was agreed to as a very necessary measure to prevent the spread of this disease.

On most of the elevated lines there has always been a special smoking car on each train. The new rule against smoking will make these extra cars available for general service and it is expected that the order will thus relieve congestion.

On the surface lines smoking has always been permitted on the front platform. The medical authorities agreed that there was an unusual amount of expectorating by smokers and this had a tendency to spread influenza and other diseases. The officials of both companies were agreeable to the change and the commissioner of health announced that it would become effective at once. The rule will be enforced by the police department.

As a first step in the line of staggered hours for opening and closing, the managers of the State Street department stores announced that they would have their employees report for duty in three shifts, instead of one. A concerted effort will be made to have this system extended in all industrial establishments in the loop district, including the big stores and downtown factories. This move is being promoted by the Association of Commerce, the Illinois Manufacturers' Association, the Office Building Managers' Association, and the State Street merchants. It is expected to have a considerable effect in reducing the peak load mornings and evenings.

Favorable Action on D. C. Belt Line

A favorable decision has been reached by the War and Navy Departments for the establishment of a belt line at Washington, D. C., to relieve electric railway congestion in the center of the city and to accommodate government workers in West Potomac Park. The plan for this belt line formed the subject of a section of the reports of John A. Beeler to the Public Utilities Commission during the summer.

Objection to the plan was made, especially by the War Department, in that it called for the laying of car tracks on B Street through a portion of the Mall, which, officials thought, would mar the beauty of the park. This objection was withdrawn on Oct. 6. The line will be used by both the Capi-

tal Traction Company and the Washington Railway & Electric Company.

It is understood that official objection to the plan was withdrawn in the face of the pressing public necessity for better electric railway facilities. The plan involves the laying of new tracks over a portion of the route. The government will either construct them or guarantee the cost.

The District Commissioners have turned the matter over to the Bureau of Industrial Housing, Otto M. Eidlitz, director, who has full power to build any railway necessary to accommodate war workers.

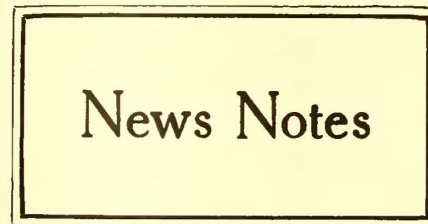
Agree on Pittsburgh Wages

At meetings on Oct. 2 motormen and conductors of the Pittsburgh (Pa.) Railway voted to accept an increase in wages making the maximum pay 48 cents an hour, and agreed to consent to temporary changes in the schedules. The men agreed also to work such hours as are deemed necessary in carrying on the war work of the district.

Effective on Sept. 16 the receivers for the company agree to the following changes in wages:

Present wages: First six months, 37 cents an hour; second six months, 39 cents an hour; second year, 41 cents an hour; third year and thereafter, 45 cents an hour.

New wages: First three months, 43 cents an hour; next nine months, 46 cents an hour; first year and thereafter, 48 cents an hour.



Portland May Employ Women.—The Portland Railway, Light & Power Company, Portland, Ore., is considering the employment of women. The matter is being taken up with the employees.

Influenza Stops Road.—So serious were the inroads made among its employees by the Spanish influenza that the Brattleboro (Vt.) Street Railway, included in the system of the Twin State Gas & Electric Company, was compelled to suspend service on Oct. 11.

Labor Matters Adjusted.—All misunderstandings between the employees of the Seattle & Rainier Valley Railway, Seattle, Wash., and that company, which threatened to cause a strike, have been settled satisfactorily. Back wages will be paid the men for the month of August. If the city of Seattle does not purchase the railway, as is now contemplated, the matter of an increase in wages will be referred to the War Labor Board.

Examinations for Car Equipment Inspectors.—The United States Civil Service Commission announces an open competitive examination for senior in-

spector of car equipment. Applicants must be between twenty-five and sixty years of age, have had at least five years' experience as master mechanic, master car builder, general car foreman or similar service, and within two years preceding the date of application have been in active service in such capacity. Applications must be filed with the Civil Service Commission, Washington, D. C., by Nov. 12. The work is to be with the Interstate Commerce Commission.

New Working Terms Wanted.—A ten-hour work day is asked by the motormen and conductors of the Washington Railway & Electric Company, Washington, D. C., in an agreement which they have submitted to the company. A letter accompanying the agreement asks that representatives of the union be granted a conference with officials of the company to consider the terms of the memorandum. No changes in the wage scale are asked for, the company having recently put into effect a new scale of 43 cents an hour for the first three months, 46 cents an hour for the next nine months and 48 cents thereafter.

Portland Wages Before Board.—The matter of allowing a 60 per cent increase in wages demanded by inter-urban train operators employed by the Portland Railway, Light & Power Company, Portland, Ore., will be decided by the War Labor Board. A review of the testimony has been forwarded to Washington, D. C. Franklin T. Griffith, president of the company, in testifying stated that the men have already been granted substantial increases and that their new demand, if granted, would mean an increase of 128 per cent over what was paid in June, 1917. The application for an increase was filed by the trainmen, engineers and conductors on a basis of 79 cents an hour for conductors, 53 cents for brakemen, 73 cents for motormen and 53½ cents for trolley men. The present scale is 48½ cents for conductors and motormen.

Wages and Fares Coupled.—A delegation representing employees and officials of the Springfield (Mo.) Traction Company, waited on the City Council recently with a request to make an appointment for the purpose of discussing the new demands of the railway workers for an increase in wages. All the members of the delegation assured the Council that the negotiations between the employees and the company for an increase in compensation are of an entirely friendly nature. E. C. Deal, general manager of the company, intimated that the only means apparent to the officials of the company by which to raise the money to pay the increase demanded would be through raising the fares. Mr. Deal said: "It is a matter in which all the citizens of Springfield are interested and our suggestion is that a committee of prominent citizens should be appointed to look into the question and make a report recommending the proper course to pursue."

Financial and Corporate

Canadian Line Scrapped

Electrification of Competing Line and Rise of Auto Compel Suspension by London & Lake Erie Line

Following a period of uncertainty in which municipal purchase and scrapping seemed alternate probabilities, the London & Lake Erie Railway & Transportation Company, London, Ont., has gone the latter route. Freight and passenger service terminated, on twenty-four hours notice, on the night of Oct. 9. The rails, according to report, will go to Japan, while cars, overhead and other property are being disposed of to half a dozen parties who have made offers of purchase.

COMPANY WANTED TO SELL

The company offered some months ago to sell out to London, Ont., St. Thomas, Port Stanley, Lambeth and the other municipalities served, at \$445,000, representing about 50 per cent of the bonded indebtedness. Sir Adam Beck, London, Ont., secured a report from engineers of the Ontario Hydroelectric Power Commission showing that the road would meet capital charges, with no allowance for taxes or depreciation, if \$241,000 were paid in 5 per cent bonds. He reported further that the road had a scrap value of \$261,000 against which a charge of \$20,000 would have to be made for dismantling and disposing of the railway property.

The company rejected the offer but after announcing in May that it would scrap the line at once, it continued negotiations with a group of Lambeth citizens, who reported on Oct. 8 to a meeting of municipal representatives in London that they believed the company would sell for \$325,000. Sir Adam Beck presented a report showing that since May \$8,000 a year would have to be added to operating costs, as the people could no more readily avoid paying advanced wages than the private company. The purchase was therefore considered no longer feasible. Sir Adam suggested as an alternative plan that London and other places directly concerned buy a 10 or 12-mile section south from London to Lambeth or Tempo, tie this in with the London Street Railway system and hand it over to the latter for operation, at a "fair profit."

PROMPT TO DISCONTINUE SERVICE

The directors of the London & Lake Erie Railway & Transportation Company held a meeting immediately afterward and determined to discontinue service the following night, abandon negotiations for the sale and dispose of the physical property of the company without delay.

As stated some months ago in the ELECTRIC RAILWAY JOURNAL, the electrification of the paralleling London & Port Stanley Railway and the development of the use of autos in the rural districts destroyed the earning capacity of the former once prosperous line.

Receiver Fagan a Fighter

Stands Out Stoutly for What He Regards as the Best Interest of Pittsburgh Railways

Charles A. Fagan, one of the receivers of the Pittsburgh (Pa.) Railways, on Oct. 8 in the United States District Court filed a petition and answer dissenting from the answer of his colleagues, J. D. Callery and H. S. A. Stewart, who had replied to the recent petitions of the Colonial Trust Company and the Union Trust Company, trustees, demanding payments of about \$100,000 in the way of fixed charges.

WOULD CONSERVE FUNDS

Mr. Fagan thus continues his opposition to the expenditure of funds in the hands of the receivers of the Pittsburgh Railways for fixed charges and interest due bondholders of underlying companies, in the face of the uncertain results from the 7-cent fare, the recent annual wage increase of approximately \$450,000, and the paramount need of rehabilitating the system.

The majority receivers concurred in the filing of the answer, so far as admitting that the amounts were due. Receivers Callery and Stewart did not state specifically in their answer that they believed that the money should be paid to the bondholders represented by the trust companies.

The petitions demanding that the interest due the bondholders of the Washington & Canonsburg Street Railway and the Pittsburgh & West End Passenger Railway, Oct. 1, 1918, be paid were filed in the United States Court. The petitioners alleged that the two underlying companies were operating on a profitable basis and that the receipts in the hands of the receivers from the two systems were sufficient to pay the interest due. The amount involved is said to be \$100,000.

RECEIVERS HAVE \$1,118,053

Mr. Fagan declared that it was impossible for the receivers to ascertain what portion of the funds in the hands of the receivers had been derived from underlying companies. He said that the funds in the hands of the receivers on Sept. 5, 1918, are \$1,118,053, and that the funds belong generally to all the creditors of the Pittsburgh Railways and not to any one creditor. He further avers that the receivers are under contract with the public to return excess money in the event that the Public Service Commission reverses the 7-cent fare schedule.

In his petition Mr. Fagan said:

"If all the fixed charges due and past due against the Pittsburgh Railways are paid and the court should

order the expenditure of funds which municipalities have asked for improvements and if the receivers should expend the money already ordered by the court for improvements, the receivers would have insufficient funds to carry out their plans."

Mr. Fagan has asked that the court order a general survey of all the fixed charges of the Pittsburgh Railways past due, and determine what funds are necessary to be retained to make the betterments and improvements ordered by the court. He has asked further that some system be adopted by the receivers, with the approval of the court, by which such portions of the fixed charges shall be paid by the receivers as they fall due. He has still further asked that the court make an order by which the receivers shall be guided in the payments of fixed charges so that all creditors of the Pittsburgh Railways may be treated on equal basis.

Petaluma Sale Oct. 29

To aid in the reorganization of the Petaluma & Santa Rosa Railway, Petaluma, Cal., the reorganization committee on Oct. 8 asked authority from the State Railroad Commission to bid the property in and to pay off certain indebtedness. The reorganization committee is composed of Rudolph Spreckels, Frank A. Brush, George P. McNear, Allen I. Kittle, W. H. Hamilton, Russell Daurie, H. P. Goodman, James Otis and L. B. Maclay, and they have incorporated the Petaluma & Santa Rosa Railroad under the order of the Railroad Commission made on Aug. 16 last. The reorganized company has the following officers: Thomas Maclay, president; George P. McNear, vice-president and treasurer; and R. W. Wise, secretary.

According to the applicant railroad company, it wishes to bid for the property of the railway on Oct. 29, in a foreclosure sale ordered by the Superior Court of Sonoma County, and it has proposed to pay for it with bonds to the amount of \$750,000 issued by the reorganized railroad, through an exchange process with the old company's bonds. In addition, the newly incorporated railroad has sold its stock in the sum of \$72,730, and it asks authority to expend \$66,400 of that amount in discharging five notes for different sums.

The authority asked is carrying out the purpose of the reorganization agreement.

The approval of the reorganization plan of the company was referred to in the ELECTRIC RAILWAY JOURNAL for Aug. 31, page 387, at which time the terms of the reorganization were reviewed.

Spokane Company Earnings

Washington Water Power Company Shows Surplus of \$940,709 After Paying Dividends

The income, profit and loss statement of the Washington Water Power Company, Spokane, Wash., for the year ended Dec. 31, 1917, follows:

Gross revenue.....	\$2,856,213	
Operating expenses..	\$1,172,129	
Taxes	268,735	
Uncollectible accounts, etc.	10,028	1,450,892
Gross income from operations	\$1,405,321	
Deductions from income	769,280	
Net income.....	\$636,041	
Surplus Dec. 31, 1916	\$922,796	
Credit adjustments prior years	1,472	924,268
	\$1,560,309	
Dividends paid	619,600	
Surplus Dec. 31, 1917.....	\$940,709	

No separate figures are given in this company's report for light and power and for railway earnings, but it is stated that the number of passengers carried increased from 15,601,850 in 1916 to 17,305,047 in 1917, and that the gross railway receipts gained 15 per cent in the last year.

Owing to the location of the company in the interior, it has not enjoyed, except in the mining district, the prosperity from war business which has been experienced in some parts of the country. The additional business that has come to it, however, is of normal growth and will probably be permanent.

The car-miles in 1917 totaled 3,839,830 as compared to 3,666,944 in 1916, and the car-hours were 534,775 and 413,259 respectively. One-man cars are operated on two-thirds of the total car mileage. The company's records, it is said, show a perceptible decrease in accidents on the one-man car lines.

The total expenditures for additions and betterments in 1917 were \$456,417, of which \$32,407 was for the railway department.

One Value for Rates and Taxes

The State administration of North Dakota contemplates the valuation by the State of every public utility within its boundaries, to determine a basis for tax assessments and service charges. The valuation is being made for the State Tax Commission and the Railroad Commission by Hagenah & Erickson, Chicago, Ill. Physical property in practically all of the companies in the State has been valued and the accountants are beginning on the books.

When the valuations have been fixed by the engineers the companies will have an opportunity to come in for a hearing and ask that the valuation be increased or decreased. They will be heard both as to taxes and rates, and then an official State valuation will be announced. Thereafter the valuation, it is said, will increase or decrease as State engineers give companies credit for additions and betterments and charge off depreciation. If a company

comes into court to complain that its valuation is placed too high for taxation purposes it may be reduced, but the reduced valuation will be used as the basis in rate cases.

Mr. Erickson of the firm which is conducting the valuation work was a member of the original utilities commission of three which established the practices that made the Wisconsin plan a model for other states. Mr. Hagenah was a consulting engineer employed by the Wisconsin Railroad Commission.

North American Net Reduced

The comparative income statement of the North American Company, New York, N. Y., for the calendar years 1916 and 1917 follows:

	1917	1916
Interest received or accrued	\$493,852	\$450,131
Dividends received	1,571,675	1,824,278
Profits and compensation for services....	33,766	29,920
Total	\$2,099,293	\$2,304,329
Administrative expenses	\$100,212	\$77,961
Taxes	87,507	33,334
Interest paid or accrued	108,007	17,491
Accounts written off and reserves	13,625
Total	\$295,726	\$142,411
Net income	\$1,803,567	\$2,161,918
Dividends paid or accrued	1,489,665	1,489,665
Balance forward	\$313,902	\$672,253

This company derives its income almost entirely from interest and dividend payments by subsidiaries. In general the operating revenues of all such enterprises increased during 1917, but the operating expenses also rose to

Omaha Net Falls

Gross Revenues Rise 4 Per Cent But Higher Operating Costs Cut Into Earning Power

During the year ended Dec. 31, 1917, the gross operating revenues of the Omaha & Council Bluffs Street Railway, Omaha, Neb., increased \$141,833 or 4.36 per cent as compared to those in 1916. During the same period, however, the operating expenses rose \$184,584 or 10.07 per cent, and the net income fell off \$68,328 or 13.4 per cent.

WAGE BONUS \$25,494

On July 1 a bonus of 6 per cent of the wages earned during the previous six months was paid to each employee in the service at that time whose earnings did not exceed \$100 a month. This bonus amounted to \$25,494. Effective on July 1 the wage scale of the trainmen was increased 2 cents an hour, and a general increase in wages was made in the shops and all other operating departments. The increased cost of operating the power plant during the year was \$53,790, owing to increased cost of labor and fuel.

Taxes continued to rise, the total taxes for the year being \$315,589, an increase of \$26,613. Most of this increase was caused by the increase in the federal income tax from 2 per cent to 6 per cent of the net income.

NET SURPLUS \$42,108

Despite the large increase in operating expenses, owing to the increased cost of labor, fuel and all materials necessary to the operation of the road, the company had a net surplus for the

COMPARATIVE INCOME STATEMENT OF OMAHA & COUNCIL BLUFFS STREET RAILWAY FOR CALENDAR YEARS 1916 AND 1917

	1917		1916	
	Amount	Per Cent	Amount	Per Cent
Revenue from transportation	\$3,190,834	93.98	\$3,069,324	94.35
Revenue from other operations	204,326	6.02	184,003	5.65
Gross operating revenues	\$3,395,160	100.00	\$3,253,327	100.00
Operating expenses	2,017,731	59.43	1,833,146	56.35
Net operating revenue	\$1,377,429	40.57	\$1,420,180	43.65
Taxes assignable to railway operations.....	314,572	9.27	288,679	8.85
Operating income	\$1,062,857	31.30	\$1,131,501	34.80
Other income	17,368	0.51	14,839	0.45
Gross income	\$1,080,225	31.81	\$1,146,340	35.25
Deductions from income	638,417	18.86	636,204	19.56
Net income	\$441,808	13.01	\$510,136	15.69
Dividends	399,700	11.77	400,000	12.30
Surplus for year	\$42,108	1.24	\$110,136	3.39

such an extent as to leave smaller margins for dividends after provision for increased interest charges. This explains a large part of the loss of almost 54 per cent in the year's surplus income of the holding company, although it should be noted that the expenses of this concern were more than doubled.

The results of operation of the two leading railway subsidiaries, the Milwaukee Electric Railway & Light Company and the United Railways of St. Louis, were noted in the ELECTRIC RAILWAY JOURNAL of July 13 and Sept. 14 respectively.

year of \$42,108, after paying the usual dividends of 5 per cent on the preferred stock and 4 per cent on the common stock.

The balance shown in accrued depreciation, as of Jan. 1, 1918, was \$1,573,886. Of this amount \$110,145 was charged to the account during the year for rebuilding tracks and other renewals. Moreover, \$288,551 was expended during the year for additions and betterments. No new extensions were made, the principal item of expenditures being for the purchase of forty semi-steel pay-as-you-enter passenger cars.

Financial News Notes

Wants City to Take Line.—A hearing was held at Topeka, Kan., on Oct. 5 on the application of the Kansas Electric Utilities Company to the Public Utilities Commission for permission to junk its plant. At the hearing officers of the company told the commission that they would be glad to turn the line over to the city of Parsons if the city would operate the road for the benefit of the citizens. The company said it could not afford to continue the operation of the line under the terms and conditions that exist at present. The losses of the company were referred to briefly in the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 5, page 634.

Stockholders Await Road's Fate.—Stockholders in the Southern Illinois Traction Company, for several years in the hands of a receiver, expect that when the United States District Court convenes on Oct. 21 in special session at East St. Louis, Ill., a final report and order to sell assets will be issued. The rails have been laid for about ten years and never used. This is the road in which former United States Senator William Lorimer, as the head of Lorimer & Gallagher, was interested. The East St. Louis terminus of the line is at Fourth Street and Broadway. At one time the company obtained a franchise for a St. Louis loop and planned to come into the city via the free bridge. The St. Louis franchise was later revoked.

Receiver's Appointment Confirmed.—The appointment of Harrison B. Freeman, Hartford, Conn., as temporary receiver of the Hartford & Springfield

Street Railway, Warehouse Point, Conn., was confirmed by Judge William S. Case on Oct. 14. The appraisers appointed are Warren P. Bristol, local manager of the Connecticut Company at Hartford, and Walter P. Schwabe, Thompsonville, general manager of the Northern Connecticut Light & Power Company. The receiver is authorized to continue the business for four months. The appointment of Mr. Freeman as temporary receiver was noted in the ELECTRIC RAILWAY JOURNAL of Oct. 12, page 672.

Abandonment Stopped by Injunction.—Judge Oliver Branch of the Superior Court at Claremont, N. H., has issued an injunction restraining the Claremont Railway & Lighting Company from discontinuing its freight and passenger service. The company had announced its intention of taking this step on Oct. 19 unless a purchaser for the property came forward. Judge Branch acted on petition of manufacturers and town officials. He set Oct. 15 for a hearing on the question of appointing a receiver for the property. The company operates 6 miles of line. The decision to abandon the road was referred to briefly in the issue of the ELECTRIC RAILWAY JOURNAL of Oct. 5, page 634.

Will Abandon Forty-four Miles.—When the new tariff of the Berkshire Street Railway, Pittsfield, Mass., referred to elsewhere in this issue, goes into effect on Nov. 12, service will be discontinued for the present at least on the "Huckleberry" line from Lee to Huntington and from Great Barrington to Egremont and from Great Barrington to Canaan, Conn. By this order 44 miles of track will be abandoned as follows: From Lee to Huntington, 24 miles; from Great Barrington to Egremont 7 miles; from Great Barrington to Canaan, 13 miles. This order will probably mean giving up the power station at Sheffield and transferring the operating base to Housatonic.

Bristol County Line Dismantled.—Swift-McNutt Company, Boston, Mass., has dismantled the property of the Bristol County Street Railway and its line running from Hebronville to Taunton. This is the whole of the company's property with the exception of the 3½-mile branch from Briggs Corner to Attleboro, which was purchased by the city of Attleboro and is being operated under the name of the "A. B. C. Railway," under an arrangement with the Interstate Consolidated Street Railway. The Bristol County Street Railway is the predecessor company which some time ago took back under its unsatisfied mortgage the property being used by the reorganized company, the Taunton & Pawtucket Street Railway. Notes in regard to efforts to save the line from dismantlement were published in the ELECTRIC RAILWAY JOURNAL of Jan. 26, Feb. 16, May 4 and Aug. 1.

Government Funds to Rehabilitate Line.—William B. Cutter, receiver of the Buffalo & Depew Railway, Buffalo, N. Y., has been granted permission by Justice Louis W. Marcus in the Supreme Court of Erie County to issue \$45,000 of receiver's certificates, and to execute a contract with the United States Housing Corporation of the Bureau of Industrial Housing and Transportation of the Federal Department of Labor, for the rehabilitation and re-equipment of the line. Under this contract the government will buy the receiver's certificates and the proceeds will be applied to the extension of the railroad one-half mile into the village of Lancaster and the renewal of a part of its roadbed. In addition to taking these certificates, the government also agrees to buy twelve additional cars and a new 300-kw. rotary converter and lease them to the receiver for the period of the war. This order and contract are the result of efforts made by the American Car & Foundry Company, Depew, to have the government aid in the rehabilitation of the road. The extension will be between Depew and Lancaster.

Electric Railway Monthly Earnings

ATLANTIC SHORE RAILWAY, SANFORD, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Aug., '18	\$23,054	\$11,944	\$11,110	\$596	\$10,514
1m., Aug., '17	24,863	12,408	12,455	430	12,025

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

1m., July, '18	\$216,072	*\$171,814	\$44,258	\$35,839	\$8,418
1m., July, '17	220,802	*143,462	77,340	35,790	41,550
7m., July, '18	1,179,532	*1,021,780	157,752	250,926	93,174
7m., July, '17	1,218,890	*885,051	333,839	250,385	83,454

CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m., Aug., '18	\$1,696,059	\$54,325	\$1,641,734	\$31,819	\$1,609,915
1m., Aug., '17	1,366,659	30,809	1,335,850	226	1,335,624
12m., Aug., '18	21,661,286	423,096	21,238,190	52,241	21,185,949
12m., Aug., '17	17,296,942	320,588	16,976,354	3,264	16,973,089

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO

1m., July, '18	\$57,656	*\$36,013	\$21,643	\$11,772	\$9,871
1m., July, '17	56,772	*33,540	23,232	11,439	11,793
7m., July, '18	313,849	*211,884	101,965	80,711	21,254
7m., July, '17	300,093	*186,100	113,993	82,007	31,986

GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.

1m., July, '18	\$251,823	*\$159,850	\$91,973	\$39,523	\$52,42
1m., July, '17	175,143	*116,321	58,822	37,192	21,633
12m., July, '18	2,462,034	*1,599,471	862,563	466,650	395,913
12m., July, '17	1,962,079	*1,301,593	660,486	443,142	217,344

*Includes taxes. † Includes non-operating income.

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
12m., Aug., '18	\$6,915,831	\$4,494,572	\$2,421,259	\$1,109,035	\$1,312,224
12m., Aug., '17	6,019,418	3,391,350	2,248,068	948,121	1,479,947

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

1m., Aug., '18	\$2,725,190	\$1,843,234	\$881,956	\$818,358	\$63,598
1m., Aug., '17	2,436,680	1,404,966	1,031,714	812,440	219,274
2m., Aug., '18	5,451,453	3,523,787	1,927,665	1,632,644	295,021
2m., Aug., '17	4,874,074	2,834,441	2,039,633	1,623,771	415,862

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

1m., Aug., '18	\$445,648	*\$337,060	\$108,588	\$103,645	\$39,643
1m., Aug., '17	426,115	*274,715	151,400	85,282	73,167
12m., Aug., '18	5,552,609	*3,961,496	1,591,113	1,143,063	\$563,449
12m., Aug., '17	4,444,721	*2,847,949	1,596,772	939,530	701,590

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

1m., July, '18	\$1,000,340	*\$634,767	\$365,573	\$316,992	\$48,581
1m., July, '17	586,369	*401,049	185,320	192,735	77,415
12m., July, '18	10,927,234	*6,782,383	4,144,851	2,626,716	1,518,135
12m., July, '17	8,734,738	*5,318,963	3,415,775	2,263,456	1,152,319

SAVANNAH (GA.) ELECTRIC COMPANY

1m., July, '18	\$97,977	*\$69,992	\$27,985	\$25,496	\$2,489
1m., July, '17	78,072	*53,543	24,529	24,352	177
12m., July, '18	1,091,340	*735,802	355,538	297,053	58,485
12m., July, '17	897,533	*595,688	301,845	286,971	14,873

Traffic and Transportation

Southern Fare Review

New Orleans Gets Increase—Many Other Rate Cases Still Pending, Including Atlanta

The news from various sections of the Southeast regarding electric railways carries a feeling of optimism. The Alabama Public Service Commission has granted the Anniston Traction Company the right to increase car fares to 6 cents over the entire system with the exception of the Oxford line, on which there will be a 10-cent fare. Permission was likewise granted the Mobile Electric Company to charge 6 cents, with the stipulation that the increase shall remain in effect until after the signing of a general peace. Although the Montgomery Traction Company asked for 7 cents it was allowed an increase to 6 cents. It was also ordered that transfers be given over all the lines, thereby forcing the company to extend this privilege to Pickett Springs and Camp Sheridan. Present rules governing the sale of tickets to school children must be continued and the company must render safe and adequate service. The Georgia Railroad Commission has allowed the Augusta-Aiken Railway & Electric Company to increase its fare from 5 cents to 6 cents. As a concession to the public, the commissioner's order requires that no changes shall be made in regulations regarding transfers, nor any changes in the regulations governing the transportation of infants. The petition of the Athens Railway & Light Company will be heard on Nov. 5.

Following out the recommendations of the War Finance Corporation the City Council of New Orleans has passed an ordinance granting an increase of 35 per cent in rates for gas and electricity. On a writ of injunction filed by attorneys for organized labor, however, orders were issued by Judge Gage in the Civil District Court, for the officials of the New Orleans Railway & Light Company to appear on Oct. 16 and show cause why an injunction should not be issued restraining the company from putting the power increases into effect and charging fares in excess of 5 cents.

The War Finance Corporation loaned the company \$1,000,000 with the understanding that the city would allow an increase in rates. The opposition to the increase is coming from organized labor in the face of a recent ruling by the War Labor Board, whereby wages of the employees of the company were increased in some instances as high as 70 per cent. The agitation has elicited from the War Labor Board a letter to John R. Alpine, acting president of

the American Federation of Labor, as noted on page 709 of this issue.

Taking the position that a public utility company could not be expected to increase its expenses by paying higher wages to employees, without an opportunity to increase its income by means of higher fares, the War Labor Board has put itself on record at last, and the decision in this case will probably have a far-reaching effect. The outcome of the New Orleans situation will have considerable bearing on the Atlanta hearing set for Oct. 14, which in a measure is a parallel case to that of New Orleans.

Five Cents in Indianapolis

The Public Service Commission of Indiana on Oct. 12 granted the Indianapolis Traction & Terminal Company a straight 5-cent cash fare, effective at midnight, on Oct. 13. A charge of 1 cent is to be made for all transfers when issued, and this 1-cent charge is to be rebated when the transfer is offered in payment of fare, in accordance with the transfer regulations.

The sale of 4-cent tickets is discontinued, but patrons may tender these tickets in payment of fare until Oct. 20, when any surplus tickets will be redeemed by the company. The sale of tickets at the rate of five for 25 cents is covered by the new order of the commission.

The decision of the commission also agrees to the proposal which was accepted by the Indianapolis Traction & Terminal Company, covering the appointment of three directors to the company by the Governor of Indiana, the Mayor of Indianapolis and the Indianapolis Chamber of Commerce respectively.

The commission also recommended that to enable the company to compete in the labor market and secure sufficient men for the operation of its cars a 50 per cent increase in its wage budget should be made. The company on Oct. 13 announced that the new wage schedule for motormen and conductors in the employ of the company would be as follows:

In service one year or less, 34 cents; more than one year and less than two years, 35 cents; more than two years and less than three years, 36 cents; more than three years and less than four years, 37 cents; more than four years and less than five years, 38 cents; five years and over, 39 cents.

Increases in wages will also be made in other operating departments of the company.

The new fare system is to be tried for sixty days, at which time it will be determined whether the revenue produced will be adequate.

Columbus Case Reargued

Representatives of the Eastern Bondholders Insist Upon Right to Surrender Franchise

Arguments were heard before United States District Judge H. C. Hollister on Oct. 10 in the case of Eastern bondholders against the city of Columbus, Ohio, to prevent the enforcement of the ordinance which requires the Columbus Railway, Power & Light Company to operate on the basis of eight tickets for a quarter. The allegations were similar to those made in the case brought some time ago by the company itself, except that the protection of bondholders living outside of the State of Ohio was made a consideration in the appeal.

FIRST SUIT DISMISSED

Judge D. C. Westenhaver of Cleveland dismissed the first suit for want of jurisdiction and in his comments said it is not within the province of a court to nullify a contract between the city and a public service corporation. The sanctity of contracts must be upheld, he contended, although he advised the city to enact legislation that would give the company needed relief from the burdens brought on by war conditions.

The principal question argued in the later suit was whether the contract really was binding upon the company, if it wished to give it up, and how much the company was affected by the conditions arising out of war emergency. City Solicitor Scarlett contended that there was no statute under which the company could be released from the contract. He quoted extensively from Judge Westenhaver's opinion. He explained, however, that the City Council was now taking steps to look into the company's financial condition and have an appraisal of its property made with a view to arriving at a fair basis for an increase in the rate of fare. Mr. Scarlett said that members of the Council did not feel they could rely upon the statements furnished by the management of the company.

PREVIOUS ARGUMENT REITERATED

J. S. Clark, president of the E. W. Clark Management Company, by which the road is operated, presented its case. He followed the same line of argument used in the first case. He said that the franchise granted the company in 1901 gave it the privilege of operating on the streets of the city, and that it could be terminated at any time. It was shown that the old rate of fare, eight tickets for a quarter, would not pay the expense of operation, especially since the wages of employees have been so materially increased. The fact that the Federal War Labor Board had recommended an increase in the rate of fare, when the decision on employees' wages was announced, was among the subjects that received attention at the hearing.

Freight Rates Increased

Commission Allows Connecticut Company 40-50 Per Cent Advance in Station-Service Freight Charges

Because of increased operating costs the Connecticut Company, New Haven, Conn., has been authorized by the Public Utilities Commission to advance still farther the freight rates which went into effect on Jan. 1, 1918. The present authorization made effective on Oct. 15 the following rates for one-class station-service freight: 15 cents per 100 lb. for a distance not exceeding 5 miles, and 1 cent per 100 lb. for each additional 5 miles or fraction thereof, the minimum charge being 35 cents for shipment.

STATEMENT OF RATES

Under the old rates the minimum charge was 10 cents per 100 lb. for a short haul of not exceeding 10 miles, the maximum charge being 29 cents per 100 lb. for the longest haul on the system. Under the proposed schedule submitted by the petitioner, the minimum rate would have been 26 cents per 100 lb. for a short haul of not exceeding 5 miles, with a maximum charge of 49 cents per 100 lb. for the longest haul and a minimum charge of 50 cents per shipment.

In commenting upon the proposal the Connecticut Public Service Commission says:

"The proposed rates would represent from 140 to 150 per cent increase over the present rates. The company established a rate solely upon a comparative basis, irrespective of the reasonableness of the return on the amount invested, which is contrary to all well-recognized rate-making principles. It also disregards certain material elements of expense connected with steam railroads, not present in trolley freight service, notably expensive terminal facilities.

"The rates proposed, which are applicable to all less-than-carload shipments (as the company has only one classification) are substantially the same as the first-class rates of the New York, New Haven & Hartford Railroad, although the latter has six classifications and only a small percentage of its freight is carried as first class. The proposed rates cannot, therefore, be justly claimed to be on a parity with steam railroad rates, as they are 55 per cent higher than the average of the second, third and fourth-class steam railroad rates. The petitioner claims that this increase over steam railroad rates is justifiable because of the better and more expeditious service which it renders.

LIBERAL RATE POLICY NECESSARY

"In establishing a rate at this time to meet emergency conditions, the commission feels that a liberal policy should be followed in order that utility companies may be maintained at their maximum efficiency. Such a policy, however, does not contemplate the establishment of rates which would

cause an unnecessary burden upon the public."

Taking into consideration, therefore, the question of depreciation, the increase in wages, the probable future increase in cost of material and supplies, and also the fact that the company's entire business is not producing sufficient revenue to pay operating expenses and fixed charges, the commission decided that an average 40 per cent to 50 per cent increase in station-service freight rates would be reasonable, even with the assumption that a certain per cent increase in rate would not yield a like per cent increase in revenue.

Two Cents a Mile in Holyoke

The Holyoke (Mass.) Street Railway has applied to the Public Service Commission of Massachusetts for the right to put into effect a new fare system on Oct. 30 which will be on a 2-mile basis at approximately 2 cents a mile and will be in the nature of a universal zone system. Permission to sell tickets at the rate of twelve for \$1 will also be sought. The proposal is to divide the operations of the company's cars into twenty zones and will still further reduce the riding power of a nickel. The new project does away with lap-overs and will simplify the operation of the cars to a considerable extent, and transfers will be issued to ticket holders only. The changes that are proposed in the tariff which has just been filed with the commission affect the Holyoke, Chicopee, Amherst and Sunderland lines of the company.

The City Hall will be the center of the inner zone and the company proposes to charge a 5-cent fare from that point to any point within the inner zone. To ride from one point within the inner zone to another point in the same zone will cost 10 cents in cash or 8½ cents by use of tickets. This will mean a double fare when a passenger rides through the zone, past the City Hall.

On the Westfield line there will be three fare limits from the Holyoke City Hall to the Westfield town line. The Chicopee, Chicopee Falls and Springfield lines will have the same fare limits, but instead of being able to make the trip for 6½ cents by the use of tickets it will cost 8½ cents using tickets, or 10 cents cash fare.

Two registers, one for cash and the other for tickets and transfers will be installed in all cars. Passengers using tickets can obtain transfers, but otherwise transfers will not be issued. A cash fare of 5 cents will allow a person to ride no further than 2 miles. A ticket for which 8½ cents has been paid will allow of a ride of approximately 4 miles.

Zone fares have been in effect in the city of Holyoke since Feb. 17. The situation there with respect to revenue obtained by the Holyoke Street Railway was reviewed in the issue of the ELECTRIC RAILWAY JOURNAL for Sept. 14, page 456.

Berkshire Fare Increase

Company at Pittsfield, Mass., Will Retain Five-Cent Unit, But Stop Some Lines

After a careful investigation of the use made by the public of the Berkshires of the service of the Berkshire Street Railway, Pittsfield, Mass., a plan has been worked out and has been filed with the Public Service Commission providing for a uniform rate over the entire system and still maintaining the 5-cent piece as the unit of fare. This has been accomplished by a rearrangement of the fare zone in the suburban territory and a reduction of the fare area in the cities.

The plan contemplates a circle with a radius of approximately 3 miles from the center of North Adams, the center of Pittsfield and the center of Great Barrington. Within that radius the fare will be 5 cents, with certain charges for transfers. Beyond this there will be an additional fare of 5 cents, making the fare from North Adams to Williamstown and Adams 10 cents, from Pittsfield to Dalton 10 cents, and from Great Barrington to Housatonic 10 cents. The portions of the lines outside of the outer circles have been divided into zones of approximately 2 miles each, in each of which zones a 5-cent fare will be charged. It is proposed further that at certain hours of the day transfers will be issued within the inner circle at Pittsfield and North Adams without extra charge, and that at other times a charge of 2 cents will be made for a transfer.

Under this arrangement the fare from Pittsfield to Berkshire will be 15 cents, to Cheshire 25 cents, to Adams Center 35 cents, and to North Adams 45 cents, with the addition of the war tax for all fares over 35 cents.

The fare from Pittsfield to Lenox village will be 20 cents, to Lee 25 cents, to South Lee 35 cents, to Stockbridge 40 cents, to Glendale 45 cents, to Housatonic 50 cents, and to Great Barrington 60 cents, with the addition of the war tax for all fares over 35 cents.

It is the hope of the management that it will not be necessary to abandon and scrap any of the company's property, but for the present at least, it is proposed to discontinue service upon the lines south and west of Great Barrington and upon the line from Lee to Huntington. This is necessitated in order that the company may continue a going concern and not be forced to discontinue service essential to the communities from Great Barrington to the Vermont State line. The management says that without the increase in revenue coupled with economies to be obtained by a discontinuance of service now operated at a loss, the property can no longer be run so as to give the required service to this more densely-settled portion of the county.

The new tariff will go into effect on Nov. 12. After that date 44 miles of track will be abandoned.

Court Hears New Jersey Case

The Public Service Railway, Newark, N. J., began charging a 7-cent fare on Oct. 15, the date set by the Board of Public Utility Commissioners for the new fare. Each passenger is receiving a receipt for the extra 2 cents, however, pending the final court ruling.

The question of issuing these extra fare receipts came before Justice Swayze at the hearing held by him at his home on Oct. 10 on the writ obtained by the League of Municipalities to prevent the new fare being put into effect. The court at this hearing gave it as his conclusion that the legal right to have the status quo preserved was clear. He said that while it had been demonstrated to him by President T. N. McCarter of the railway that the plan which had been suggested for giving receipts for the 2 cents was impracticable, some other arrangement could probably be devised to relieve the situation. The system of receipts now in force was then worked out by the company.

The matter of the rebate slips out of the way, Justice Swayze heard argument on Oct. 14 by both sides as to the validity of the order of the utility commission for the 7-cent fare. At the conclusion of this argument Judge Swayze announced that he would decide the case on or before Nov. 19, the day on which the Court of Errors and Appeals opens. If the case is decided against the company an appeal will probably be taken at once to the Court of Errors and Appeals. An early adjudication is anticipated.

Fare Review at Trenton

Justice Trenchard in the New Jersey Supreme Court has allowed a writ to the city of Trenton to review the decision of the Board of Public Utility Commissioners whereby the Trenton & Mercer County Traction Corporation was authorized to charge a flat 6-cent fare for service beginning on Oct. 15. Under the order of Justice Trenchard the writ will act as a stay pending litigation of the new rate unless the company can devise some plan whereby it will give its passengers receipts entitling them to a refund of the excess fare paid under the new rate in the event of the Supreme Court reversing the rate advance allowed by the commission.

At a conference between Justices Trenchard and Swayze and counsel for the city and the company it was agreed that the final hearing to determine the legality of the commission's 6-cent fare decision would be held before Justice Swayze at Newark on Oct. 16. Justice Swayze will sit as the Supreme Court, and it is expected that his decision in this case will be handed down shortly afterward. At the conference on Oct. 11 the company said it would be difficult to get the receipts for excess fare printed in time to use them by Oct. 15. Justice Swayze said it was entirely up to the company whether it gave receipts and collected the new rate or

whether the writ should act as a stay pending the suit. Justice Trenchard told the company that a system of receipts could be worked out satisfactorily. He pointed out that two classes of riders must be provided for in the scheme—those using strip tickets and those paying cash fares.

George L. Record, counsel for the city of Trenton at the conference, contended that there was no such thing as emergency rates as were contemplated by the public utility law of the State and that the State body acted without legal authority.

Chamber of Commerce Report Unsatisfactory

The special traction committee of the Chamber of Commerce of Norfolk, Va., has made its final report to the board of directors. Among other things, the report states that the committee has found itself "powerless to reach any satisfactory understanding with the Virginia Railway & Power Company for better service, and the matter has to be finally settled by the City Council." Furthermore, that the committee "feels that the service to and from the Army and Navy bases is inadequate and that the company should be required to give such service as will obviate the necessity on the part of the government of using army trucks for transportation" of its employees. The committee recommended that Delos F. Wilcox, who made a report on the traction problem in 1914, be brought to Norfolk again to make a report up to date. Finally, the committee went on record as being opposed to the City Council granting the Virginia Railway & Power Company the right to increase its fares to 6 cents until it first makes improvements in its service to justify the increase. The report has been adopted by the full chamber.

Chicago Fare Hearing Closed

The second hearing before the Public Utilities Commission of Illinois on the petition of the Chicago Elevated Railroads for a 7-cent fare was postponed from Sept. 30 to Oct. 7 because city officials who were to appear in opposition were detained on other matters. The hearings were held on Oct. 7, 8 and 9, the final summing up taking place on the last date.

The discussion and arguments concerned chiefly what increase in revenue the 7-cent fare would produce. As stated in the report of the first hearing in the *ELECTRIC RAILWAY JOURNAL* for Sept. 8, page 592, Britton I. Budd, president of the Chicago Elevated Railroads, testified that judging from the reports of other companies operating with increased fares he believed the 7-cent fare would produce an increase in gross revenue not exceeding 20 per cent or \$2,000,000 while the requirements are \$2,447,000.

The case is now in the hands of the commission.

Transportation News Notes

Eight Cents in Wilkes-Barre.—The Wilkes-Barre (Pa.) Railway went to an 8-cent fare on Oct. 1.

Benton Harbor Asks Relief.—C. K. Minary, president Benton Harbor-St. Joe Railway & Light Company, has asked the Boston Harbor City Council for the right to charge a higher fare.

Survey of Scranton Conditions.—Delos F. Wilcox has been retained by the City of Scranton, Pa., to inquire into and report on the situation affecting service and rates on the Scranton Railway.

Jitney Fares Ten Cents.—Jitney bus fares in San Francisco, Cal., were raised on Oct. 14 to 10 cents, following a meeting of the Jitney Drivers' Union. There were only 270 jitneys on the streets of the city at that time.

Six Cents in Racine.—The 6-cent fare for adults and the 3-cent fare for children, granted to the Milwaukee Heat, Light & Traction Company, operating in Racine, Wis., was put into effect on Oct. 6. The decision of the Railroad Commission of Wisconsin in this case was rendered on Sept. 10.

Six Cents Wanted in Niagara.—The International Railway, Buffalo, N. Y., has asked the Council of Niagara Falls, N. Y., in which it operates, to approve an increase in fare from 5 cents to 6 cents. The Council has taken the request under consideration pending reference to the Public Service Commission.

Harrisburg Increase in Effect.—The 5-cent fare passed out of existence in Harrisburg, Pa., on Oct. 1, when the Harrisburg Railways added 1 cent and the Valley Railways 2 cents to the nickel charge. Certificates are being issued to each passenger for redemption in case the Public Service Commission rules against the increase.

Wants Freight Rate Increase.—The New Jersey & Pennsylvania Traction Company has filed with the Board of Public Utility Commissioners of New Jersey a schedule of proposed increases in freight rates on its lines between Trenton and Princeton. Besides extra charges for smaller articles, there are also increases provided for the freightage of lumber, machinery, etc. There will be a public hearing on Oct. 22 on the company's application for increased passenger rates.

New Seattle-Tacoma Rates.—A new passenger tariff has been filed with the Public Service Commission of Washington by the Puget Sound Electric Railway, increasing the one-way fare between Seattle and Tacoma, and all way points and terminals. The round-trip fare will remain the same.

The new tariff provides for an increase in the one-way fare from 73 cents to 91 cents, between Seattle and Tacoma, and from 2 cents to 2½ cents a mile on way points and terminals.

More Seven-Cent Fares Announced.—The Philadelphia & Easton Electric Railway, Doylestown, Pa., has filed notice of an increase of fares from 6 to 7 cents, and advances in freight and milk rates with the Public Service Commission. Other notices of 7-cent fares have been filed by the Citizens' Traction Company, operating in Oil City, Franklin, and vicinity, while the Lancaster & York Furnace Street Railway, Millersville, Pa., has given notice of an increase in 5-cent fare zones, causing increases in single fares.

Seven Cents for Vicksburg.—At a special meeting of the Aldermen of Vicksburg, Miss., held recently for the purpose of taking up with the Vicksburg Light & Traction Company the readjustment of fares, it was ordered by the board that the city attorney prepare an ordinance together with necessary resolutions allowing the company to make a charge of 7 cents for all fares. Where tickets are purchased, however, a discount of three-fourths of a cent on each fare will be made by the company, thus making all such fares 6½ cents. Tickets for school children are to remain at the same price as in the past.

San Antonio Plea Rejected.—The City Commission of San Antonio, Tex., at the regular Council meeting on Oct. 3 adopted an ordinance denying the application of the traction department of the San Antonio Public Service Corporation for an increase of fares to 6 cents or the alternative of eliminating the transfer and provided that a violation of the 5-cent fare and transfer provisions of the franchise would constitute a misdemeanor, punishable upon conviction by a fine and subject the company to forfeiture of its franchise. The ordinance was adopted by unanimous vote of the Mayor and Commissioners present.

After Dishonest Conductors.—As a result of a careful investigation the New York State Railways has discovered that considerable of the money collected in fares on the Utica lines does not reach the company. In consequence it caused the arrest recently of three conductors, Floyd V. Carter, Ernest W. Miller, and Thomas J. Donnelly. The men were arrested upon the complaint of J. N. Jones, superintendent of transportation of the Utica lines. When arraigned in court Carter and Donnelly pleaded guilty and were sentenced to thirty days while Miller, who pleaded not guilty, was released on \$200 bail for trial later.

Charleston Fare Hearing Nov. 7.—The Charleston Consolidated Railway & Lighting Company, Charleston, S. C., has applied to the Railroad Commission of South Carolina for an increase in passenger rates over the line, viz.; a straight fare of 5 cents, at all times and at all hours, from the city boundary

to the navy yard, with an additional straight fare of 3 cents from the navy yard to North Charleston, with the privilege of a return ticket from the navy yard to North Charleston of 5 cents. The commission will hold a public hearing in regard to the matter in Charleston on Nov. 7.

Six Cents and Tickets in Galveston.—The Galveston (Tex.) Electric Company is now charging a 6-cent fare, with half fares for children under twelve and for school children. The ordinance recently passed by the City Commission became effective on Oct. 1. No change was made in regard to transfers. According to an announcement made by the general manager, the company will place on sale books of tickets, each book containing ten tickets for 60 cents for the convenience of patrons who do not wish to be troubled with pennies. The tickets will be on sale at the carhouses and at all drug stores and other principal places of business in the city.

Will Vote on Jitney Return.—The voters of Los Angeles, Cal., are to be called upon at the election on Nov. 5 to decide whether the proposed ordinance shall be adopted which has been submitted by initiative petition and makes lawful the operation of jitney buses in the downtown district, from which they are now excluded. Inclosed with the ballots at the election will be an argument against the ordinance by George Baker Anderson, in which the voters are appealed to convincingly to vote against the measure. As part of the argument against the ordinance are included the reasons advanced by the New York Commission in ruling against the jitney.

Six-Cent Ordinance for Austin.—The City Council of Austin, Tex., has ordered the city attorney to draft an ordinance authorizing the Austin Street Railway to charge 6 cents for full fares and 3 cents for half fares, with 3 cents as the fare for students. This action was taken after a hearing on a petition presented by the company asking authority to increase fares. The request of the company was reinforced by a petition from the employees of the railway setting forth that the employees should have a wage increase and that the company had declined to increase wages unless it was authorized to increase fares. It is regarded as quite certain that the Council will pass the ordinance when it is drafted by the city attorney.

Court May Fix Fare.—In commenting on the appointment of a receiver for the Binghamton (N. Y.) Railway the *Republican* of that city made the following statement about fares: "In connection with the going of the company into receivership it is interesting to learn that probably the rate of carfare will be increased far beyond what it would have been fixed at if the Council had allowed the rate to be raised. The company has applied for permission to raise it to 8 cents. That

is reported as higher than if the Council had granted its permission. But the court will probably issue an order fixing the carfare at about 8 or 9 cents, and that will be all. There are many Councils, but only one court, and what that court says, according to the attorneys, goes."

Fare Referendum in Houston.—Qualified voters of Houston are to have an opportunity to say at the polls whether or not the Houston Electric Company shall be permitted to charge a 6-cent fare, with half fares at 3 cents. When the City Council decided that the company was entitled to the increased fare an ordinance was passed to that effect, to become effective on Oct. 1. A referendum petition was filed during the week ended Oct. 5, which made the ordinance void pending an election if it was found that sufficient qualified voters had signed. The city secretary has found that the number signing the petition is sufficient and he will so report to the Council. It then becomes the duty of the Council to call a special election or repeal the ordinance.

Six Cents for Montgomery.—The Public Service Commission of Alabama has rendered a decision providing for a fare of 6 cents on all lines of the Montgomery Traction & Light Company, Montgomery, Ala. The order of the commission also requires that transfers be given to and from all lines and that a safe and adequate service be established. The company, under the order, must continue its present rules relative to the hauling of children of certain ages, and the granting of cut rate tickets to school children. The order was made effective as of Oct. 5. The company first applied to the City Commissioners for a 7-cent fare. This was granted, but the Public Service Commission set the rate aside, holding it alone had jurisdiction. That commission then authorized a 6-cent fare.

Increase in Fare Averted.—John Scott, electric railway commissioner, Franklin County, Ohio, found that the Westerville interurban line of the Columbus Railway, Power & Light Company was on the tax duplicate for a valuation of \$1,100,000, while the valuation on which the franchise is based was \$300,000. He went to the Public Utilities Commission and the tax valuation was reduced to \$350,000. The company had been setting aside \$900 a month to pay the tax for 1918. Under the reduction in valuation only \$325 a month is required. The point with Mr. Scott is that the sinking fund, used as a barometer for the rate of fare, had fallen below the required \$15,000 and an increase seemed imminent. The surplus saving through the reduction of the tax value, however, makes the fund more than \$20,000 and the threatened increase in the rate of fare has been averted for the present. Operation under this franchise after it had been in effect a year was described in the *ELECTRIC RAILWAY JOURNAL* for Aug. 10, page 230.

Personal Mention

New Vice-President

R. L. Warner, Boston Banker, Succeeds Murray Carleton as Vice-President of United Railways, St. Louis

At the meeting of the board of directors of the United Railways, St. Louis, Mo., held on Oct. 8, the resignation of David R. Francis, Jr., who has entered the army, was accepted. In his place R. L. Warner was elected a director of the company. Murray Carleton resigned as vice-president of the company and Mr. Warner was elected vice-president in his place. Mr. Warner will begin his duties with the company as soon as he makes his arrangements to move to St. Louis. He will devote his attention principally to the finances and public relations of the company.

Mr. Warner was born in Kansas City, Mo., in 1869, and was graduated as a mechanical engineer at Cornell University in 1892. He then entered the service of the Westinghouse Company and was with that company for fourteen years, engaged in manufacturing, engineering, selling and management. He was for several years the New England manager, resident at Boston. In 1906 he formed a partnership with Randolph F. Tucker in the banking firm of Warner-Tucker & Company, Boston. He will terminate his connection with the firm and move to St. Louis.

During his connection with the Westinghouse Company and later with Warner-Tucker & Company, Mr. Warner has been connected with the organization, construction, financing and operation of various electric railways, more particularly in Connecticut and Massachusetts. He has also been active in the development of a number of water-power and other public service enterprises in New England and in the South, and one steam railroad—the South Carolina Western. This steam railroad is now consolidated with the Seaboard Air Line. His work in the various enterprises with which he has been connected has had largely to do with the construction, financing and reorganization of properties.

G. W. Van Derzee, for the last five years assistant to S. B. Way, vice-president and general manager of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., will also continue as assistant general manager with little change in his present duties.

J. H. Lucas, formerly assistant to H. A. Mullett, superintendent of rolling stock of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been appointed superintendent of rolling stock of the company

to succeed H. A. Mullett, who has become assistant general manager of the company.

C. E. Haygood, manager of the railway department of the Manila Electric Railroad & Light Company, Manila, P. I., is visiting the United States on a vacation and for the purpose of consulting with the officers of the J. G. White Management Corporation, New York, N. Y., the operating managers of the Manila Company. He expects to return to the Philippines before the first of the year.

H. A. Mullett, formerly superintendent of rolling stock of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been appointed assistant general manager of that company. He will generally assist S. B. Way, vice-president and general manager, and assume such other duties as may be assigned to him. Mr. Mullett has been with the company twelve years, seven years of which he spent as superintendent of rolling stock.

Samuel E. Smith has resigned as general manager of railways of the Reading Transit & Light Company, Reading, Pa., effective on Oct. 31, to accept a similar position with the Mobile Light & Railroad Company, Mobile, Ala. Mr. Smith has been manager of railways of the Reading Transit & Light Company since last January. Before that he was superintendent of railways of the company. He entered business as a cash boy in a department store in Reading. He next became connected with the dispatching and storehouse department of the Philadelphia & Reading Railroad. He left railroad work to enter the service of the Holophane Glass Company in New York. About a year later he joined the forces of the Atlantic Refining Company. His next position was with the Monticello Company at Reading and Trenton, dealers in brick. His connection with the Reading Transit & Light Company followed six years later. His first work for the company was as purchasing agent. Subsequently he became claim agent of the company. With the change in control of the railway and light property at Reading Mr. Smith was made superintendent of railways.

Dressel D. Ewing, who for the last five years has been connected with the department of electrical engineering at Purdue University, has been made professor of electric railway engineering. He is a graduate of Ohio Northern University where he specialized in electrical and mechanical engineering. Upon completion of his course in 1906 he spent a short time in cable work, but soon entered the railway field as rod-

man in the maintenance-of-way department of the Missouri Pacific Railway at St. Louis, Mo. After serving as transit man and assistant engineer on this railway he became assistant division engineer of the Hocking Valley Railway at Logan, Ohio, where he had charge of the field and office engineering incident to the reconstruction of some 50 miles of track, which had been damaged by a heavy flood, and to the construction of a large new classification yard in the mining district. In the fall of 1907 Professor Ewing returned to Ohio Northern University as professor of electrical and mechanical engineering. In 1912 he went to Purdue for a year's graduate work, specializing in railway electrification. At the end of the year he was appointed assistant professor of electrical engineering and later was made associate professor of electric railway engineering. In connection with his college work he has done some consulting engineering along general lines and has spent several summers in the railway project section of the general engineering division, Westinghouse Electric & Manufacturing Company, where he was engaged on railway electrification work. For the past three years he has spent a considerable portion of his vacation time in editorial work for the *ELECTRIC RAILWAY JOURNAL*.

Obituary

R. M. Dixon, president of the Safety Car Heating & Lighting Company, New York, N. Y., died of heart disease at his home on Oct. 16. Mr. Dixon was one of the trustees of the United Engineering Society. He was also treasurer of the New York Railroad Club.

William Allis, son of the late E. P. Allis, died on Oct. 10 at the age of sixty-nine years. Mr. Allis succeeded his father as president of the E. P. Allis Company, Milwaukee, Wis., and continued in that position until the consolidation which resulted in placing the Allis-Chalmers Company at the head of the largest engine-building corporations of the world. He then became chairman of the board of directors.

Joseph Parkin, who was the responsible operator and one of the receivers of the Seattle, Renton & Southern Railway, Seattle, Wash., the predecessor of the Seattle & Rainier Valley Railway, Seattle, Wash., is dead. Mr. Parkin was the first superintendent after the construction of the road, and from 1893 to 1897 he was superintendent of the Seattle-Everett Traction Company. For eight years prior to his appointment as receiver of the Seattle, Renton & Southern Railway in 1912 he was employed in the United States Engineering Department in connection with the Puget Sound fortifications. Mr. Parkin was forty-five years old.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Railroad Conditions Improving in New England

Approach of Winter, However, Makes it Advisable to Secure Shipments as Soon as Possible

Electric railway purchasing agents are at present enjoying much better railroad service than was common in the Northeast a few months back. Deliveries are now being handled extremely well, despite the shortage of labor in so many lines of industry. Within the factories conditions are unfavorable to prompt filling of orders, even with the necessary priority classification; but once shipments enter New England their movement to their destinations is reported to be better than for some time past.

CASES OF SHIPMENTS GOING ASTRAY REDUCING IN NUMBER

To be sure, there are some cases of stray shipments, a prominent purchasing agent stated in a recent conference, but probably not many more than in normal times. It is rarely necessary at this time to detach tracers from electric railway office staffs in order to follow up supply shipments on New England rails, and this releases skilled labor for other important work where it is greatly needed.

The railroads are heavily taxed with business and the approach of winter with its threatened embargoes makes the present a highly desirable time to utilize existing facilities to the utmost. An enormous traffic in coal is moving into New England in anticipation of cold weather demands, and the requirements of our overseas forces in rolling stock and motive power are so heavy that there is little certainty of the winter's passing without a good many trying embargoes.

Now is clearly the time for purchasing bureaus to follow up factory production and deliveries as closely as possible, so that all the material which can be shipped before snow flies may be sent into the consumer's territory. "A few dollars spent in follow-up work now may save the loss of hundreds or thousands of dollars later when the non-arrival of important rolling stock parts or other supplies cuts down the available car units on the system below the point of efficient schedule handling.

A good deal of way and roadway maintenance material is being purchased, and the necessity for replacing tracks and other worn-out equipment with available supplies from scattered sources makes it important to watch shipment dates very carefully. Follow-

up work by wire is meeting the present situation reasonably well, so far as relations with the railroads go.

With the increasing employment of women in the offices of purchasing agents, it is desirable to bring out the important aspects of the railroad shipment problem for future action if need be. This applies to other sections of the country as well as to New England.

Rush shipments are occasionally made by motor truck where the completion of an important construction job requires it, as in the extension of central station power plant facilities in which electric railways are to share the benefit; but in general, it appears unnecessary to resort to expensive methods of shipping supplies where the railroad trunk line service is being as well handled as in New England.

The really weak spot in the delivery chain is in the factory producing the supplies and equipment needed, and for six or eight weeks more it is expected that the railroad conditions will continue reasonably favorable to the consignee, considering the load which the transportation companies are carrying and that which is in sight for the end of the year.

St. Louis Car Labor Award

National War Labor Board Renders Decision Raising Day Rates 25 Per Cent

On Friday, Oct. 11, the National War Labor Board rendered its decision and award in the controversy between the St. Louis Car Company and its employees. The case has been pending for five months. A preliminary agreement was reached on May 15 and conferences were held but the two parties could not reach a final agreement. The case was therefore again submitted to the National Board.

The decision just handed down provided for a 25 per cent increase in day work rates over wages in effect on June 15, piece rates to be adjusted by a conference between the company and employees. A guaranteed minimum hourly or daily wage rate is provided for but it is not to operate so as to reduce anyone's pay. The increased wages are retroactive from June 15.

Working hours and overtime are discussed with the latter fully defined. For plain overtime work time and a half is allowed but for Sundays and holidays double time.

The award is to remain in force for the period of the war but provisions are made for application for adjustments at semi-annual periods.

Standardization Resulting from War Conditions

Large Numbers of Types and Sizes of Electrical Goods Now Being Eliminated

In a few ways the entrance of the United States into the war has been a blessing in disguise. Not the least of these pertains to the standardization of electrical supplies. It has in the past been more the rule than the exception to hunt for something special when a new use arose than to employ a standard article. In certain lines it was felt to be almost necessary to add every so often new devices to an already large number that would do equally well.

In some lines that have been closely controlled standardization of product has progressed far. In lines less closely controlled it has been difficult to get the manufacturers to agree on standards. The Associated Manufacturers of Electrical Supplies has done considerable in the different sections. By a free exchange of ideas and opinions a number of standards have resulted and many special designs have been removed from catalogs.

Now, however, that raw materials are so necessary for purely war purposes, standardization is virtually forced on a willing industry. By a sweeping curtailment in the number of types and sizes of appliances and supplies, almost all of the special equipment is put aside. Those styles and sizes that remain, it would be natural to suppose, will be those for which the greatest demand exists and which satisfy, and can be used in the greatest number of instances. In other words, they will virtually become the standards.

The manufacturer has had to take such action but the benefits that will result so far as he is concerned are apparent. By being reduced to a standard output he would under normal conditions be able to produce more cheaply and his operation should show less waste in material. He will have no worry about a competitor getting out a special product. He will be able to save in his catalog and in his sales expenses. Besides these benefits, there are others.

The only question that arises is to what extent the styles and sizes that have been eliminated will again be placed on the market when the supply of raw material becomes easier. It is doubtful if they will all come back under any circumstances, as many of them have not been especially active.

Car Cord Very Scarce and High in Price

Although Cotton Has Dropped 20 Per Cent There Are No Indications That Cord Will Follow

Conditions in the braided cord market have been getting very unsatisfactory from the buyer's point of view for some time. While prices have not advanced for over two months, they are very high. Cords such as are used by electric railways were quoted this week at \$1 per pound. This is an increase of somewhat more than 150 per cent in two years. The price then was 38 cents per pound. This was increased to 85 cents and finally to the present price of \$1.

Even at this price, however, it is almost impossible to obtain any quantity of cord. No stocks of any appreciable size are apparent and deliveries are very poor. It is probable, however, that roads can obtain sufficient for their immediate needs either by utilizing some different grade of cord or else shopping around and perhaps paying a premium for immediate shipment of what they want.

The situation in the basic cotton market, of course, is at the bottom of the whole thing. The high price of cotton necessitated an advance in the price of cord. However, now that cotton has dropped off some 20 per cent from its recent peak price there is no indication that cotton cord will follow downward. What small amount of cord there is now available was probably fabricated from high-priced cotton

and the same is true of that cord which will be available for some weeks. It is improbable with the shortage of cord in the market that the manufacturers will accept any less on their high-priced cotton and therefore it seems natural to expect that present prices will prevail for some time.

Coal Production Suffers Slump

Bituminous Output Falls Off 3.6 Per Cent and Anthracite Slightly

The output of bituminous coal during the week ended Oct. 5 decreased 462,000 net tons or 3.6 per cent compared with the week preceding but exceeded production during the week of Oct. 5, 1917, by 1,774,000 net tons or approximately 16 per cent, according to the regular weekly report of the Geological Survey. Estimates placed production (including lignite and coal made into coke) at 12,585,000 net tons as compared with 13,047,000 net tons during the week ended Sept. 28 and as against 10,811,000 net tons during the corresponding week of 1917. The average production per working day during the current week is estimated at 2,097,000 net tons, 78,000 net tons lower than the daily average during week of Sept. 28, but 295,000 net tons in excess of the daily average of the same week last year.

The production during the week of Oct. 5 while considerably lower than the week preceding, exceeded the weekly requirements by 4 per cent and

the weekly requirements to make up the past deficit by 3.2 per cent.

Production of anthracite during the week ended Oct. 5 is estimated at 2,052,000 net tons, a slight decrease compared to the week preceding and the same tonnage as produced during the corresponding week of last year. Daily average is estimated at 342,000 net tons as compared with 338,000 net tons for the coal year to date and as against 331,000 net tons during the same period of 1917. The total production for the coal year to date is estimated at 53,703,000 net tons, an increase of approximately 2 per cent over last year.

Specifications for W. M., B. & F. C. St. Ry. Cars

Specifications on the three new motor cars ordered by the Webster, Monessen, Belle Vernon & Fayette City Street Railway, Charleroi, Pa., as reported in the ELECTRIC RAILWAY JOURNAL of Oct. 12, are as follows:

Number of cars ordered.....	3
Name of road.....	Webster, Monessen, Belle Vernon & Fayette City Street Railway
Date order was placed.....	Aug. 20, 1918
Date of delivery.....	Oct. 8, 1918
Builder of car body.....	Cincinnati Car Co.
Type of car.....	Semi-convertible
Seating capacity.....	31
Length over all.....	32 ft., 0 in.
Width over all.....	8 ft., 3 1/2 in.
Body.....	Wood
Interior trim.....	Cherry
Roof.....	Monitor
Car trimmings.....	Curtain Supply Co.
Control.....	West K-11-A
Hand brakes.....	Cincinnati Car Co.
Heater equipment.....	Consolidated
Headlights.....	Incandescent
Motors.....	Westinghouse No. 68
Seats.....	Hale & Kilburn
Trucks.....	Peckham No. 7-D

NEW YORK METAL MARKET PRICES

	Oct. 3	Oct. 17
Copper, ingots, cents per lb.....	26	26
Copper wire base, cents per lb.....	28.75	28.75
Lead, cents per lb.....	8.05	8.05
Nickel, cents per lb.....	40	40
Spelter, cents per lb.....	9.35	9.05
Tin, Chinese*, cents per lb.....		
Aluminum, 98 to 99 per cent., cents per lb.....	†33.10	†33.10

* No Straits offering. † Government price in 50-ton lots or more, f. o. b. plant.

OLD METAL PRICES—NEW YORK

	Oct. 3	Oct. 17
Heavy copper, cents per lb.....	23.50 to 24.50	23.50 to 24.00
Light copper, cents per lb.....	21.00 to 21.50	20.50 to 21.50
Red brass, cents per lb.....	22.00 to 23.00	23.00 to 24.00
Yellow brass, cents per lb.....	15.50 to 16.00	15.00 to 16.00
Lead, heavy, cents per lb.....	7.50 to 8.00	7.50 to 8.00
Zinc, cents per lb.....	7.50 to 8.00	7.50 to 8.00
Steel car axles, Chicago, per net ton....	\$41.52	\$41.52
Old carwheels, Chicago, per gross ton....	\$29.00	\$29.00
Steel rails (scrap), Chicago, per gross ton.	\$34.00	\$34.00
Steel rails (relaying), Chicago, gross ton..	\$60.00	\$60.00
Machine shop turnings, Chicago, net ton.	\$16.25	\$16.96

ELECTRIC RAILWAY MATERIAL PRICES

	Oct. 3	Oct. 17
Rubber-covered wire base, New York, cents per lb.....	34	34
Weatherproof wire (100 lb. lots), cents per lb., New York.....	34.40 to 36.75	38.75 to 40.00
Weatherproof wire (100 lb. lots), cents per lb., Chicago.....	35.00 to 37.72	35.00 to 39.00
T rails (A. S. C. E. standard), per gross ton.....	\$70.00 to \$80.00	\$70.00 to \$80.00
T rails (A. S. C. E. standard), 100 to 500 ton lots, per gross ton.....	\$67.50	\$67.50
T rails (A. S. C. E. standard), 500 ton lots, per gross ton.....	\$63.50	\$62.50
T rail, high (Shanghai), cents per lb.....	4 1/2	4 1/2
Rails, girder (grooved), cents per lb.....	4 1/2	4 1/2
Wire nails, Pittsburgh, cents per lb.....	3 1/2	3 1/2
Railroad spikes, drive, Pittsburgh base, cents per lb.....	4 1/2	4 1/2
Railroad spikes, screw, Pittsburgh base, cents per lb.....	8	8
Tie plates (flat type), cents per lb.....	*3 1/2	*3 1/2
Tie plates (brace type), cents per lb.....	*3 1/2	*3 1/2
Tie rods, Pittsburgh base, cents per lb..	7	7
Fish plates, cents per lb.....	*3 1/2	*3 1/2
Angle plates, cents per lb.....	*3 1/2	*3 1/2
Angle bars, cents per lb.....	*3 1/2	*3 1/2
Rail bolts and nuts, Pittsburgh base, cents per lb.....	4.90	4.90
Steel bars, Pittsburgh, cents per lb.....	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb.....	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb.....	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb.....	4.35	4.35

	Oct. 3	Oct. 17
Galvanized wire, ordinary, Pittsburgh, cents per lb.....	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount †.....	77%	77%
Car window glass (single strength, first three brackets, B quality), New York, discount.....	77%	77%
Car window glass (double strength, all sizes AA quality), New York discount..	79%	79%
Waste, wool (according to grade), cents per lb.....	15 to 25	15 to 25
Waste cotton (100 lb. bale), cents per lb..	13 to 13 1/2	13 to 13 1/2
Asphalt, hot (150 tons minimum), per ton delivered.....	\$38.50	\$38.50
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton.....	\$42.50	\$42.50
Asphalt filler, per ton.....	\$45.00	\$45.00
Cement (carload lots), New York, per bbl.....	\$3.20	\$3.20
Cement (carload lots), Chicago, per bbl..	\$3.34	\$3.34
Cement (carload lots), Seattle, per bbl..	\$3.68	\$3.68
Linseed oil (raw, 5 bbl. lots), New York, per gal.....	\$1.90	\$1.80
Linseed oil (boiled, 5 bbl. lots), New York, per gal.....	\$1.92	\$1.82
White lead (100 lb. keg), New York, cents per lb.....	14	14
Turpentine (bbl. lots), New York, cents per gal.....	64	64

* Government price. † These prices are f. o. b. works, with boxing charges extra. ‡ Bid price, no quotation.

Franchises

San Diego, Cal.—A temporary permit has been granted by the City Council of San Diego to the Emergency Fleet Corporation to lay street car tracks from Thirty-second Street to the shipyard site, pending the granting of a franchise. While the tracks and the franchise will be held in the name of the Emergency Fleet Corporation, cars will be operated to the plant by the San Diego Electric Railway.

Bridgeport, Conn.—The Public Utilities Commission of Connecticut has granted the petition of the Connecticut Company for its approval of the method of construction of a single-track electric railway in Bridgeport for a distance of about 3400 ft., together with a 300-ft. turnout east of Noble Avenue. The construction of this railway is made necessary by war emergencies, and the company presented its petition to the commission at the request of the United States Housing Corporation.

Newburyport, Mass.—The Bay State Street Railway has been granted permission by the Board of Aldermen for the relocation of its tracks on State Street from High Street to the Newbury line.

Bellaire, Ohio.—The Wheeling Traction Company has been granted a five-year franchise by the City Council to operate cars within the city limits of Bellaire.

Trade Notes

Tri-City Railway Company of Illinois, Rock Island, Ill.—The Public Utilities Commission of Illinois has denied the petition of the Tri-City Railway Company of Illinois for permission to construct an extension in Moline. The commission found the extension justified, but held that the shortage of labor and materials is such that it cannot be done at present.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md.—A contract has been awarded by the Washington, Baltimore & Annapolis Electric Railroad to the Union Switch & Signal Company, Swissvale, Pa., for block signaling to be installed on its double-track line between Naval Academy Junction and District Line near Washington. This is the second section of signaling to be recently undertaken on the main line of that road between Washington and Baltimore. The new signaling will protect 36 miles of track and thirty-seven switches with twenty blocks on a headway of approximately three minutes under caution and six minutes under clear signals. The signaling has been laid out to reduce this running time one-half by the later addition of intermediate signals when future traffic warrants. The apparatus will be similar to that employed in the first installation, involving continuous alternating current track circuits, style "N," color light signals, mounted on iron pipe posts and model 15 vane-type relays. The switch indicators will be of the light type with push-button attachment, and will be used in all switches. Power at 2200 volts, 25 cycles, will be secured from the railroad company's power system at Naval Academy Junction.

New York Municipal Railway Corporation, Brooklyn, N. Y.—The Sixtieth Street subway tunnel under the East River was "holed through" on Oct. 14. This tunnel is the one through which the line of the New York Municipal Railway Corporation, connecting Manhattan with Corona and Astoria, L. I., will be operated. This tunnel is the deepest of the five new tunnels under the East River. The construction work is being done by P. McGovern & Company, New York, under the supervision of the Public Service Commission for the First District of New York. It is expected that the tunnel will be completed early next year. When it is placed in operation trains will run through it from the Long Island City terminal to Seventh Avenue, thence to Times Square, New York, and south over the Broadway line now operated by the New York Municipal Railway Corporation.

Lebanon & Franklin Traction Company, Dayton, Ohio.—The Lebanon & Franklin Traction Company, which operates a line between Lebanon, Red Lion and Franklin, has applied to the Public Utilities Commission of Ohio, for permission to discontinue the service and abandon the line.

Levis (Quebec) County Railway.—A report from Levis County Railway states that reconstruction is under way of 11½

miles of track. The company has completed 3 miles on the Quebec Bridge division and expects to complete 2 miles more before winter. The remainder will be completed next year.

Moose Jaw (Sask.) Electric Railway.—The City Council of Moose Jaw recently passed a resolution recommending that the Moose Jaw Electric Railway build a line from Fourth Avenue, S. W. and Coteau Street, west to Ninth Avenue, S. W., thence north on Second Avenue to Lillooet Street, thence along Lillooet Street to Fourth Avenue. If the company agrees to build this line at once the Council will submit a by-law to the ratepayers, providing for a straight 5-cent fare, will indorse the one-man car proposals for the duration of the war and will defer the collection of taxes for 1917 and 1918.

Virginia Railway & Power Company, Richmond, Va.—It is reported that the Virginia Railway & Power Company contemplates the double-tracking of its Bay Shore Line to the Naval Base.

Power Houses, Shops and Buildings

United Railways & Electric Company, Baltimore, Md.—A contract has been awarded by the United Railways & Electric Company to Frairie Brothers & Haigley, Baltimore, for the construction of a waiting station at Columbia Avenue and Putnam Street at a cost of about \$10,000.

Long Island Railroad, New York, N. Y.—A contract has been awarded by the Long Island Railroad to the Austin Company, Cleveland, for the construction of a building, 60 ft. x 225 ft. at Jamaica, N. Y., to cost approximately \$40,000.

Pacific Power & Light Company, Portland, Ore.—Additional equipment is being installed by the Pacific Power & Light Company at its reserve power plant in Astoria, consisting of a 700-hp. steam engine and a General Electric 750-kva. generator, the two being direct connected. The increased equipment will give its reserve plant a capacity of 1600 kw. The Hammond Lumber Company, Astoria, has ordered equipment for a steam-electric plant to produce power which will be sold to the Pacific Power & Light Company, and which the latter will distribute to shipyards and other industries in the vicinity. The equipment comprises Erie City boilers of the combined capacity of 1800 hp. and a General Electric 1500-kw. turbo-generator; also a Beyer barometric condenser, a 3000-hp. Cochrane feed-water heater and the necessary circulating and other auxiliary pumps.

Duquesne Light Company, Pittsburgh, Pa.—Preparations are being made by the Duquesne Light Company, which furnishes power to the Pittsburgh Railways, for the construction of an electric generating plant at Cheswick, to develop not less than 120,000 kw. The cost of the proposed plant is estimated at about \$16,000,000, of which amount about 35 per cent will be contributed from federal funds.

West Penn Power Company, Pittsburgh, Pa.—Work has been begun on the construction of a large electric generating plant at Springdale by the West Penn Power Company, which is controlled by the West Penn Railways. The cost is estimated at \$5,000,000. Contracts, it is understood, have been placed with the Westinghouse Electric & Manufacturing Company for two turbo-generators.

Virginia Railway & Power Company, Richmond, Va.—It is reported that the Virginia Railway & Power Company will install two boiler units to increase the capacity of its power plant at Norfolk.

New Advertising Literature

Sanford Riley Stoker Company, Worcester, Mass.—Bulletin No. 31 describing operations of Riley underfeed stokers.

W. S. Barstow & Company, Inc., New York, N. Y.—A sixty-one page booklet containing the latest financial and operating statistics for the various railway and other utility properties in which they are interested.

Beaumont Manufacturing Company, Philadelphia, Pa.—Catalog 37, giving descriptions, illustrations and dimensions of standard Beaumont gates for controlling the flow of granular materials from bunker. The design of ash pits under boilers and the correct gate to use for this purpose are illustrated.

Rolling Stock

Gary (Ind.) Street Railway is in the market for five motor and five trail cars.

United States Housing Corporation, are advised, is in the market for twenty-five cars.

Camaguey (Cuba) Electric Company is reported to be in the market for six open passenger cars.

Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va., reports that it is in the market for ten cars.

Springfield (Mass.) Street Railway has added a new style gravel car and trailer to its equipment. Both the operating car and the trailer are equipped with independent brake devices, while the trailer likewise has its independent equipment for dumping the cars.

Bangor Railway & Electric Company, Bangor, Me., has purchased from the Stone & Webster Company of Boston a freight and express car with a capacity of 30 tons. The company has also purchased from the American Car Company in St. Louis, three large one-man cars and their arrival is expected daily.

Virginia Railway & Power Company, Richmond, Va., it is reported will purchase twenty-five street cars of the latest improved type. It is understood that the money for the purchase will be advanced by the government to the traction company in the form of a loan. The cars will be used on the Norfolk lines.

San Francisco-Oakland Terminal Railways, Oakland, Cal., as noted in the ELECTRIC RAILWAY JOURNAL of Oct. 5, has been delayed on account of the difficulty in securing necessary material, in the construction of the ten trail cars building in the company's own shops, but the work is now well under way.

Trade Notes

Chicago (Ill.) Pneumatic Tool Company announces the appointment of A. G. La Pierre as traffic manager and F. O. Southbrook as manager of the order and production department, with headquarters in the home office of the company, Fisher Building, Chicago.

Boston Woven Hose & Rubber Company, Boston, Mass., at its last annual meeting, elected George E. Hall president. Mr. Hall was formerly vice-president and general manager and succeeded Henry B. Sprague, treasurer, who served as president during a portion of the past year, pending the annual election. Mr. Sprague continues as treasurer and assumes the additional duties of vice-president. Mr. Hall has been associated with the company for eleven years.

Elliott Electric Company, Cleveland, Ohio, announces its removal from 322-323 Champlain Avenue to 813-815 Superior Avenue, N. W., where it occupies the entire five floors and basement. The first floor is occupied by the retail store and supply department office. The second floor is devoted to the general office and the machinery department office. The repair shop for the repairing of motors is on the fourth floor. The remaining floors and basement are utilized to accommodate the large stock of motors and electrical supplies.

Allen & Peck, Inc., Syracuse, N. Y., formally announce the retirement of C. Loomis Allen from the firm and the change of the firm name to Peck-Shannahan-Cherry, Inc. The business conducted is that of engineers and managers of public utilities, and offices will be maintained at rooms 412-413-414 Syracuse Savings Bank Building, Syracuse, N. Y., and at 601 Maryland Trust Building, Baltimore, Md. The members of the firm are: Edward F. Peck, J. N. Shannahan, T. C. Cherry, Milford Badgero, William J. Harvie and C. D. Porter.

Robert C. Byler, for nearly four years advertising production man for the SKF Ball Bearing Company, of Hartford, Conn., has been appointed advertising manager of the SKF Administrative Company of New York City and will direct the advertising of the SKF Ball Bearing Company, of Hartford, the Hess-Bright Manufacturing Company, of Philadelphia, and the Atlas Ball Company of the same city, all of which are controlled by the SKF Administrative Company. Until arrangements are made in New York City Mr. Byler will remain with SKF Ball Bearing Company, of Hartford, Conn.

