

Electric Railway Journal

Published by the McGraw-Hill Publishing Company, Inc.
Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 50

NEW YORK, SATURDAY, DECEMBER 8, 1917

Number 23

Can Electric Railways Save More Coal?

THIS week the United States Fuel Administration has transmitted to the fuel administrators of the several states a communication in which there is special reference to the opportunities for saving energy and therefore fuel on the part of electric railways. The circular has naturally stirred up interest in electric railway circles everywhere, as an appeal from national headquarters for assistance in any direction in the task of winning the war cannot fall upon deaf ears. The Massachusetts commission has already suspended its heating regulation so far as the electric railways are concerned, in response to this request from Washington. There is no doubt that of the present annual coal production of 600,000,000 tons or more, a great deal is being wasted, largely because in the past it has been considered cheaper to waste it than to save it. In other words, the cost of the immediate investment rather than the extent of the future saving has been the controlling factor. At an address delivered before the American Society of Mechanical Engineers on Dec. 5, D. M. Myers, consulting engineer, New York City, estimated that 117,000,000 tons of coal, worth \$250,000,000, could be saved every year by efficient management of boiler furnaces. This is a startling claim, but when one compares the coal consumption per kilowatt-hour in the best plants with that in the average plants the claim seems less extravagant.

What Is the Situation in Our Field?

THE suggestions of the Fuel Administration naturally bring to mind a question as to the relative position of electric railways in comparison with other consumers, and as to the extent to which savings can be effected. An estimate made by this paper a short time ago for another purpose, which was checked for us by government bureaus, indicate that electric railways, in their own power plants, use approximately 9,000,000 tons of coal per annum. They buy energy from central stations which may be assumed to represent a consumption of 5,000,000 tons more. We may say, therefore, that they are, directly and indirectly, responsible for a total consumption of about 14,000,000 tons. This is roughly one-fortieth of the total production and represents in normal times 6 per cent, more or less, of the total electric railway operating cost. If 10 per cent of the fuel required for driving electric cars could be saved it would reduce the total consumption by more

than two-tenths of 1 per cent and the operating expense by more than six-tenths of 1 per cent or relatively three times as much. In times of peace the possibility of cutting operating expense by the amount mentioned has caused the introduction of energy-saving devices and practices, but their use is not yet universal. War prices for fuel have made them more than ever desirable. Of late the element of patriotism has entered into the fuel situation as there is a 10 per cent shortage in the supply of coal needed to meet the increased requirements. This shortage must be made up by economy in all possible directions. If service can be cut and less heat supplied, while at the same time the use of coasting is extended and power-house economies are introduced, it is possible for electric railways to save more than the average requirement of 10 per cent. At least we can accept the responsibility for that much saving.

Care in Manufacture Controlling in Axle Steel

ONE of the interesting points brought out in the article on the science of preparing car axle steel, published in last week's issue of this paper, is the necessity for uniformity of production. It has been the general experience of electric railways that where one axle fails, others of the same lot show no signs of failure. Those responsible for the transportation of passengers feel very keenly the necessity of having axles as perfect as they can be made, and within recent years both manufacturers and electric railway companies have given a great deal of attention to the subject. This has resulted in improvements in the quality of the open-hearth steel itself, as well as in methods of forging and heat treatment. In the latter, control of the heating, as explained in the article last week, is essential, and to this end the electric furnace seems to afford a desirable means. It is well to sound a warning, however, that heat treatment of itself will not free axle steel from all of the defects existing in the ordinary grade or caused by lack of care in the preparation of the steel in the open-hearth furnace or neglect in the safeguards which should be followed during the process of forging and in other vital parts of the manufacture of the axle. For this reason, while heat treatment and the use of the electric furnace should add to the excellence of the finished article, the results which are sought in the finished axle depend finally on the personality and experience of the men actually engaged in the work and the perfection of the system employed in checking the accuracy and uniformity of the methods used.

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Give the Railways a Chance to Work Out the Fare Problem

IN the opinion of F. J. Macleod, chairman Massachusetts Public Service Commission, as expressed last week before the special legislative commission, no increase in electric railway fares in Massachusetts has fulfilled expectations, and past experience does not show that fare increases are a panacea for existing evils. Accordingly he would, "for a limited period," have the State finance on an equipment-trust plan the purchase of needed additional property by companies with a certain standard of past earnings or dividends.

Such financial aid from the State coffers would be of transient value to some companies through the securing of money at cheaper rates than in the open market, but they would never be successful enterprises, capable of repaying borrowed State funds and attracting fresh private capital for further development, until their earning power was assured. "Ay, there's the rub," as Hamlet said. The fact must never be forgotten that, although the public is interested primarily in service, the investor thinks only in terms of earning power. Better management, improved methods, new equipment—these are as much the result as the cause of earning power.

An increase in fare will not of itself insure prosperity and credit, but we are firmly persuaded that the question of a fare scientifically determined to cover the cost of service is of paramount importance. Varied local problems may also have to be solved—of management, taxes, jitneys or what not—but the fare problem is bound to be there. Some commissions in the past have been too inclined to look upon other measures of relief as substitutes for rather than desirable additions to fare increases. They are even now thinking too much about the "difficulty" of prescribing fares on a cost basis.

The most practicable method which has yet been suggested of reducing the present interminable delay between the need of relief and its possession is to allow the railways, when the need occurs, to put the higher rates into effect, subject to commission revision after investigation, with the burden of proof on the complainants that the higher rates are unwarranted. Mr. Macleod is afraid that this would lead to equally objectionable delays as far as the public is concerned, with the higher rates in force; but when he says that presumably no railway would undertake to increase rates unless it had definite and more-than-temporary reasons for believing it would not be able to earn a fair return, he admits not only the lack of necessity but also the inequity of holding up all increases pending commission approval. The railways may not have known it once, but they do now, that public good-will is necessary, and this would militate against any unnecessary rate increase. Why not, therefore, free electric railways from the burden of proof and harmful delays in rates cases? If regulation has meant almost disaster for many lines, the sensible thing is to try a change in regulation.

As for the assertion that no fare increase in Massa-

chusetts has fulfilled expectations—what man can even now predict with certainty the results of a fare increase? How much less could he do so in the past? That expectations, or more properly desires, have not been fully realized means nothing except that fare regulation is still at an unsettled stage. As Mr. Macleod previously stated before the New England Street Railway Club, considerable experimentation must be carried on before one can be sure of the methods that will bring the maximum revenue results in particular cases. The least that the commissions should do is to permit this experimentation for sufficient periods to overcome any temporary boycotting of traffic by unreasoning malcontents.

Has the Tram Girder Come Back to Stay?

THE return of the Public Service Railway to the tram girder rail for paved streets, as described by Martin Schreiber, chief engineer, in our issue for last week, appears to us a very sensible move. The tram head has always been recognized to possess many points of advantage over any form of grooved rail. It is self-cleaning, and this means that it takes less power to operate cars over a tram head than over a grooved head. Moreover, because there is no groove to hold dirt and become clogged with ice and snow in winter, there is less chance for derailment, less wear on the wheel flanges, less danger of flange breakage and less noise. As compared with a T-rail, the tram head has the advantage, or disadvantage, whichever it may be called, of presenting a running surface for street vehicles, and while it is not the function of a rail to supply a track for vehicles, it is often cheaper to do so than to have the vehicles wear ruts in the stone paving next to the rail.

The principal disadvantage which used to be urged against the tram head was that it was more difficult for street vehicles to cross the rail and especially to turn out if their wheels were running on the tram. But this was in the days when most street vehicles were fitted with steel-tired wheels of large diameter. The past ten years have seen a revolution in street vehicle design, motive power and tire construction. The standard tire, of course, now is the pneumatic tire of the passenger vehicle and the wide solid rubber tire of the commercial truck. To both of these, partly because of the elastic nature of the tire and partly because of the smaller diameter of the wheel, the tram girder head presents no practical obstruction to either a right-angle turn or even when the vehicle is running in the track and has to turn out from it. The Connecticut Public Utilities Commission was one of the first to recognize this changed condition when, some few years ago, it denied a petition to require the company some years ago to change from a T-rail to a grooved rail on a short section.

It was the trilby modification, introduced, as its name implies, about fifteen years ago, that led to the widespread use of the grooved rail. Previous to this im-

provement the lip was much shorter and the groove narrower. In the trilby design the lip was made flaring to carry street traffic and thus avoid the ruts in the paving which followed the use of the old grooved rail, and the groove itself was made with a wider angle so that the wheel flange could squeeze the dirt out of the sides better than it could with the old grooved rail.

To some it may appear unfortunate that there is a revolt against the use of the grooved rail only a short time after it has been adopted as a standard by the Engineering Association. Such changes, however, are inevitable. Standards necessarily lag behind practice, and it may be that this is a case where they have lagged behind so far that they are adopted at about the time when the standard is becoming obsolete. This does not mean, however, that there will be still no use for the grooved rail, or that more of them will not be rolled after the present ones wear out. Mr. Schreiber describes in his article some points of superiority possessed by the grooved sections on streets of very dense traffic. He also points out that the section of tram girder being used by the Public Service Railway embodies a number of the modern features, such as the crowned head and the $\frac{1}{2}$ in. web, and that it is not simply the old tram girder revived.

What the Electric Lines Could Mean to Chicago Merchants

THE federal government recognizes no municipal regulations where these stand in the way of national necessity. The limitations and restrictions which city authorities have been prone to place around the hauling of freight through the city streets in electric cars do not, therefore, represent any barrier to a program of expansion for the electric railway service if it can be shown to the government that but for these local regulations the electric railways can be utilized to relieve in a remarkably high degree the steam railway congestion. Perhaps the conditions at Chicago offer the best example of what the situation ought not to be.

Here there are no less than six electric interurban railways radiating from the city limits into the surrounding rich agricultural and manufacturing communities, yet only one of these is able to run into or near the business center of the city, and this one is limited within the city to passenger service. All of these lines connect with either the surface or elevated lines—two great systems of trackage which have comparatively little use from midnight to 5 a. m.; yet, if they could be used for freight haulage, they would afford opportunity for the movement in six directions from the city of immense quantities of merchandise. However, the lack of appreciation of this fact or the thought that roads built primarily for passenger service should not carry freight, has withheld the immense value which would otherwise have accrued to the city. Meanwhile, also, the miles and miles of radiating interurban track have been subjected to a use which was only a fractional part of their capacity, and the companies owning them have been unable to serve the city to their fullest ability.

For instance, the Chicago & Joliet Electric has a double-track line all the way from the outskirts of Chicago to Joliet, and during the winter months only three passenger cars are operated, this number being all that is required to maintain an hourly service. Here is an immense capacity lying unused because the cars cannot be operated into the city over the surface companies' tracks, and because it is practically impossible to get the shippers to haul their commodities from the wholesale districts to the present terminal of the line, a distance of some 8 miles.

This is only one instance. The Chicago, North Shore & Milwaukee, and the Aurora, Elgin & Chicago connect with the elevated structures, and their cars are, for the most part, designed to give the necessary clearances at the station platforms and on the curves, but the franchise specifies that no freight other than mail and such baggage as is carried by hand may be hauled through the streets. And of course the elevated structure is largely in the streets and very little on private right-of-way. To deliver freight to these two interurban lines the shippers must haul to Church Street, Evanston, on the north, and to Fifty-second Street on the west. Even in spite of these handicaps these roads are handling a considerable quantity of freight, but not a beginning on what they could haul were it possible to have reasonably centrally-located freight terminals.

The shippers are very much interested in the service the electric lines are able to give, but with the cost of operating a 5-ton truck more than \$20 a day, and of a 3-ton truck more than \$14 a day (these figures being those given to a group of electric-railway men last month by the traffic manager of Butler Brothers in Chicago), they cannot haul 8 to 12 miles to make delivery to the electric lines, as is now necessary. So there is now in Chicago, the second largest city in the country, with its immense outgoing tonnage into the surrounding country from the hosts of manufacturing and distributing companies, and with its enormous daily inbound tonnage of vegetables and dairy products and raw materials, and its congested steam railroad terminals, none of the advantages which the electric lines bring to other cities, for instance, to Indianapolis, through service at freight rates. In this connection it should be borne in mind that every car of freight hauled over an electric line is the equivalent of adding from three to five cars to the steam-road equipment, for the shipment will be consummated and the car released for another shipper within twenty-four hours on the electric, while it would take from three to five days, and longer, on the steam lines to complete the same cycle. This condition is not universal, most fortunately, but it is widespread.

The electric lines must make their service known now. They must break down these barriers to greater freight traffic now, while their service can be of greater importance than it ever will be again after this war is over. Their watchword should be that wherever there is an originating movement of freight between points which an electric line connects, that shipment should be hauled by the electric and thus release several car-days to the steam roads for the long-haul movements.

Catenary Overhead Construction

An Intimate Study of the Design of the Overhead System for the Montreal Tunnel and Terminal of the Canadian Northern Railroad

By W. C. LANCASTER

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WHATEVER adverse criticisms may be heaped upon alternating current electrifications, they must nevertheless be given credit for the impetus which began the development of our catenary trolley systems. Away back in the dark ages, about 1905, before the days of high-voltage direct current, it was found that direct suspension of the trolley wire was not adapted to these alternating-current railroads. They required greater insulation for their high potentials, necessitating the use of porcelain, for which direct suspension was not suitable. Mechanically, too, they required something different because the heavy pantograph collector, on account of its greater inertia at generally higher speeds, could not follow the ups and downs of the trolley wire like the ordinary trolley wheel. A perfectly level contact wire was essential.

The catenary type of overhead resulted. At first it was thought that the overhead system must be as rigid as possible; but it soon developed that a certain amount of flexibility was absolutely necessary. Even with the catenary type of construction, so-called "hard spots" occurred at the hangers; that is to say, the contact wire yielded to the upward pressure of the pantograph collector less readily where it was clamped by the hangers than elsewhere, and slight kinks were formed at which sooner or later crystallization and breakage occurred due to the hammering effect of the pantographs. In order to obtain greater flexibility, a steel contact wire was placed underneath the trolley wire and held to it

by small clamps midway between the hangers. This gave more satisfactory results.

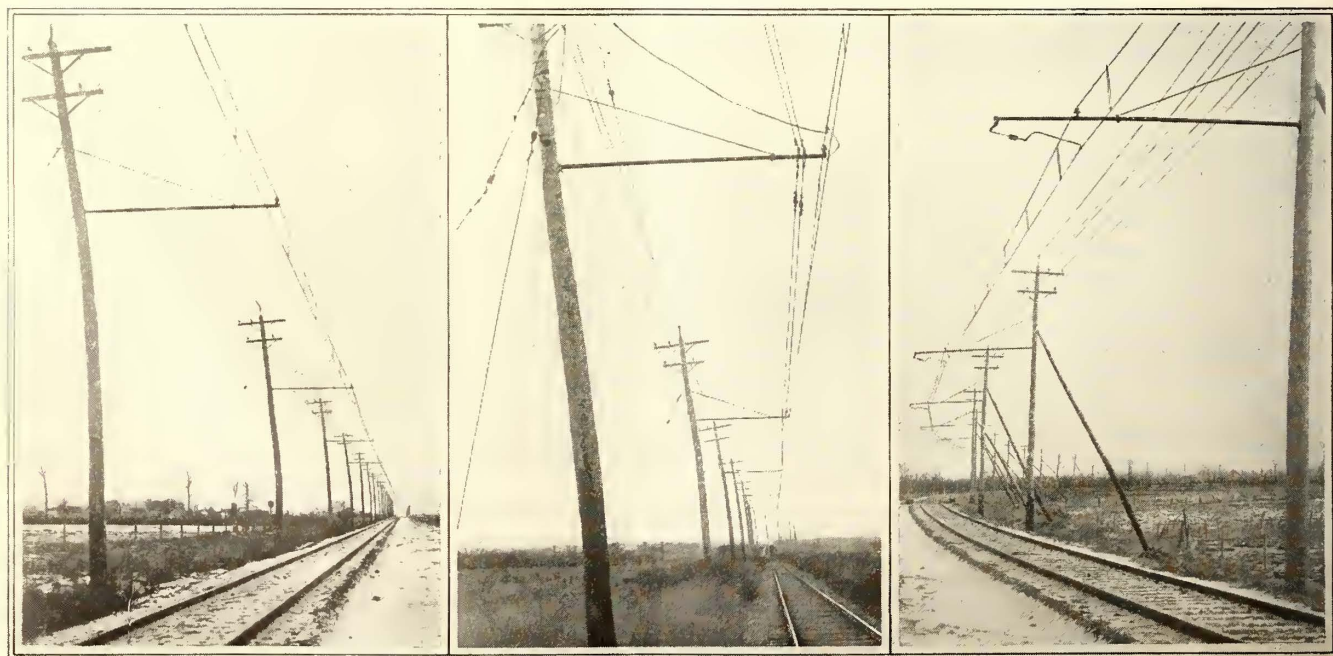
In the last few years, however, the tendency has been decidedly towards lightness of construction and maximum flexibility. Hangers are made with a loop so that they merely hang from the messenger, instead of being fastened rigidly to it, and rise with the passage of the pantograph under the contact wire.

CATENARY SUSPENSION POSSESSES CERTAIN VIRTUES

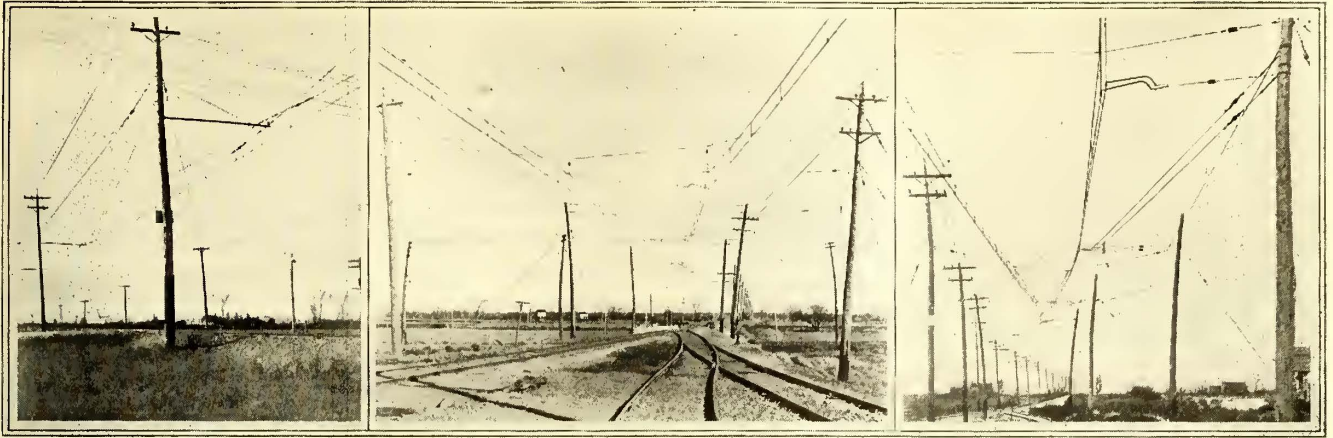
The advantages of the catenary type of contact wire suspension over the direct suspension are: (1) High-speed operation without danger of collector leaving the wire. (2) Freedom from hammer blows causing crystallization and breakage. (3) Longer spans and a consequent saving in poles. (4) Use of porcelain insulators.

Catenary construction has become fairly well standardized in the last ten years, but local conditions and the state of the metal market when the material is purchased often make it necessary to depart somewhat from standard designs. Such matters as types of poles, pole spacing, size and material for messenger and kind of trolley wire must all be thought out carefully with a full knowledge of the conditions under which the system is to be operated.

The 2400-volt, direct-current electrification of the Canadian Northern Railroad's terminal at Montreal has already been described in the *ELECTRIC RAILWAY*



CANADIAN NORTHERN OVERHEAD CONSTRUCTION—BRACKET-TYPE CONSTRUCTION—LEFT, STANDARD SINGLE-TRACK; MIDDLE, SECTION INSULATION; RIGHT, ON 2-DEG. CURVE



CANADIAN NORTHERN OVERHEAD CONSTRUCTION—CATENARY CONSTRUCTION AT MONTREAL TERMINAL—LEFT, CONTACT WIRE ANCHORAGE AND ONE END OF MESSENGER ANCHORAGE; MIDDLE, YARD CONSTRUCTION SHOWING DROPPER STRANDS AND PULL-OFF; RIGHT, CONSTRUCTION AT TURN-OUTS, CHANGING FROM SINGLE CONTACT WIRE, SINGLE TRACK, TO DOUBLE CONTACT WIRE, DOUBLE TRACK

JOURNAL for March 4, 1914, page 572, and Aug. 15, 1914, page 295. Special local conditions and extremely low temperatures are features which made the design of the catenary system for this electrification somewhat out of the ordinary. The electrified track is 10 miles long, and in this distance there is a passenger terminal station and coach yard in the city, a double-track tunnel $3\frac{1}{3}$ miles long, double tracks in a cut with low clearances under highway bridges, a long stretch of single track, both tangent and curve, and a large freight yard with repair shops and storage tracks. The temperature in the coldest winter weather reaches 35 deg. below zero; while in the hottest summer weather it will go as high as 110 in the sun. In the early spring, severe sleet storms sometimes occur, though infrequently.

WHY WOOD POLES WERE USED IN THIS CASE

For the electrified tracks outside the tunnel the use of wood poles was decided upon, but not until a careful study had been made comparing them with steel poles and reinforced concrete poles. Steel bridges with 300-ft. spans were not to be considered as they were obviously uneconomical for single track, and the only double-track construction was under the highway bridges where the low clearances required short spans. Wood poles were not only cheaper than those of either steel or concrete, but it was thought they would furnish an additional factor of safety, due to their greater flexibility. The only disadvantage in the use of wood poles was their comparatively short life. To overcome this to a large extent the butts were creosoted by the open tank process.

The poles are of Eastern white cedar. The specifications for these poles and also for the creosote oil used as a preservative, were based upon those of the National Electric Light Association. The only steel poles used are those in the terminal yard in the city, for which place they were chosen on account of their more slightly appearance. These steel poles were described in the *ELECTRIC RAILWAY JOURNAL* for Sept. 29, 1917, page 585. The wood poles are set 7 ft. in the ground and every pole is back-guyed. They are of sufficient length to carry two cross-arms for feeders, signal circuit and a three-phase transmission line for supplying the shops in the Cartierville yard with electric

power. On top of the poles there is a No. 000 copper ground wire which serves both as a protection against lightning for the circuits on the poles and also as a preventive against any trouble that might be caused by breakage of the rail bonds.

The poles throughout the single-track construction are spaced 150 ft. on tangents and 120 ft. on the 2-deg. curve. On the double-track portion, where the overhead clearance is limited, the spacing is reduced to 105 ft. on tangents. There are no curves.

DETAILS OF THE MESSENGER SPANS

The messenger for the electrification outside the tunnel consists of a $\frac{1}{2}$ -in. seven-strand Siemens Martin steel cable with an ultimate strength of 11,000 lb. and an elastic limit of 6600 lb. A hard-drawn copper or phosphor-bronze messenger was considered, in order to obtain greater conductivity. Steel, however, has a lower temperature coefficient than copper and therefore there is less variation in the length of a steel messenger with change in temperature than is the case with a copper messenger. Copper or bronze, too, must be of much larger section than steel in order to give the requisite strength, and is accordingly much heavier, so that the spans must be reduced and the number of poles largely increased. It was found that the saving in feeder copper did not justify this construction. The steel messenger was therefore adopted and two No. 0000 copper feeders installed, one the full length of the electrification outside the tunnel and the other for about 1 mile west of the substation.

The messenger is anchored every half mile. This is accomplished simply by running the end of one half-mile length past the end of the next for a distance of one span. It is then made fast to an anchor eye on the bracket through an insulator and turnbuckle, and the same point of the bracket guyed back to the next pole, which in turn is guyed against this strain. The two messengers, where they pass each other, are kept from 8 in. to 10 in. apart. By anchoring the trolley wire on the same bracket the anchorage becomes a section insulation, the air space between the messengers and trolley wires forming the insulation. If section insulation is not required a copper jumper is placed between the messengers and trolley wires.

For the double-track portion of the line cross-span

construction is used, the cross span being a $\frac{3}{8}$ -in. seven-wire Siemens Martin steel strand. The messenger is fastened to this by means of a small malleable-iron clamp called a "messenger hanger." This cross span is made up with a turnbuckle, strain insulator and wedge grip in each end, and fastened to the poles by means of eyebolts.

Where more than two tracks are spanned, as in the yards, the construction is similar, but with the addition of a cross messenger of half-inch strand above the $\frac{3}{8}$ -in. strand. This cross messenger is made fast to the poles directly, without insulators or turnbuckles, and carries the weight of the spans below through "dropper strands" of $\frac{1}{4}$ -in. steel strand. These fasten to eyes in the tops of the messenger hangers and to the cross messenger by means of Crosby clips. There is a strain insulator in each dropper strand.

Pull-offs are used on curves for holding the contact wire and messenger in the correct position over the track and on long tangents where needed for steadying the contact wire. The pull-offs are made of sherardized steel tubing bent so as to allow the passage of the pantograph. Each pull-off is fitted with a clamp ear at one end and an eye at the other. They are made as light as is consistent with strength. Adjustable links are sometimes required with pull-offs to keep the trolley wires the right distance apart at certain points, such as where the trolley wire for a turnout approaches the main trolley wire at an angle. Each link is composed of two malleable-iron brackets, with clamp ears, connected by means of a $\frac{1}{2}$ -in. pipe, the length of which between brackets can be adjusted and held by a set screw.

INSULATORS AND CONTACT WIRE

Strain insulators are of the Locke "goose-egg" type. Two sizes are used. The larger, used with $\frac{1}{2}$ -in. and $\frac{3}{8}$ -in. steel strand, withstands a wet flash-over test of 14,000 volts, and has a breaking strength of 22,000 lb. The smaller, used with $\frac{3}{8}$ -in. and $\frac{1}{4}$ -in. steel strand, withstands the same voltage test, and has a breaking strength of 12,000 lb.

The insulator used on the bracket construction is of the ordinary glazed porcelain, double-petticoat, pin type, $4\frac{1}{2}$ in. in diameter. It has a wet flash-over test of 20,000 volts. The messenger rests in the groove in the top of this insulator and is not tied except on curves.

The contact wire is of a special bronze composition, size No. 0000, with a breaking strength of 65,000 lb. per square inch and an elastic limit of 39,000 lb. per square inch. Its section is the standard of the American Electric Railway Association for No. 0000 grooved trolley wire. It weighs approximately 2104 lb. per mile-ohm at 20 deg. C. The use of this wire instead of hard-drawn copper was thought advisable both because of its probably longer life when subjected to the wear caused by sliding pantographs, and also because it could be pulled up tighter than copper on account of its greater strength. This latter reason was considered of special importance because of the wide variation in temperature in Montreal, with the consequent great variation in the sag of ordinary copper trolley wire between winter and summer.

When stressed to 2000 lb. at 70 deg. Fahr., the tension in this bronze wire reaches 4350 lb. at 30 deg. Fahr., a value well below its elastic limit.

Compensating devices consisting of systems of pulleys and weights to maintain a constant tension in the trolley wire, such as are often employed in Europe, were considered, but the complication and extra cost were thought to be too great for what they were supposed to accomplish.

The trolley wire is hung straight over the center of the track. The natural side sway of the pantographs is sufficient to prevent wearing grooves in the contact strips, making a zig-zag contact wire unnecessary.

The height of the trolley wire above top of rail is ordinarily 23 ft., except along the double-track construction and in the tunnel, where it is 16 ft. In this section two wires are used over each track. They hang side by side, supported from the same messenger, the hangers of one wire being staggered with those of the other. These double wires do not raise the hanger



CANADIAN NORTHERN OVERHEAD CONSTRUCTION—OVERHEAD IN MONTREAL TUNNEL—LEFT, SECTION INSULATION AND ANCHORAGE AT PORTAL (TWIN-ARCH SECTION); MIDDLE, IN SINGLE-ARCH SECTION; RIGHT, ON CURVE IN TWIN-ARCH SECTION

loops as high as would a single wire when a pantograph passes along, which is an obvious advantage where the head room is limited under bridges. Sparking and consequent wear both of the contact shoe and trolley wire is reduced to a minimum, since the current which would cause a spark and burn at a rough spot on one trolley wire generally finds a smooth passage through the parallel wire. Sparkless operation is obtained. This second trolley wire takes the place of a No. 0000 feeder, and thus the copper is put where it will do the most good.

The use of a steel contact wire was considered, but exhaustive tests by the General Electric Company on the wearing qualities of hard-drawn copper wire seemed to prove that the extra expense and complication of the additional wire was not justified; especially as the bronze wire adopted would have even a longer life than the hard-drawn copper wire used in the tests. The use of a steel contact wire, too, is open to the objection that rust forms on it, and unless the traffic is sufficient to keep all the rust rubbed off, this is washed down by rain on the locomotives and coaches. Rust on the under surface of the wire may also cause excessive sparking and pantograph wear.

The hangers are all of the long-loop type, having a malleable-iron, single-bolt clamp ear, and a strap varying in length to suit its position in the span. All parts are sherardized. In spans of all lengths from 150 ft. to 90 ft. the hangers are spaced 15 ft. apart.

Lightning arresters of the magnetic blow-out type are installed at half-mile intervals. The arrester is placed near the top of the pole and the ground wire run down the pole to a 3/4-in. iron pipe driven about 10 ft. into the ground. Before driving this pipe, a 2-in. pipe was driven down about 5 ft., then withdrawn and the hole filled with rock salt. The 3/4-in. pipe was driven down through the salt. No connection was made between these grounds and the track rails.

In addition to these arresters on the poles, aluminum cell arresters are installed in the substation on the positive busbars and on each feeder. No trouble whatever has been experienced from lightning, although an unusually large number of severe thunder storms occurred during the past summer.

SAG, TENSION AND TEMPERATURE

Calculations to determine the strength required of the messenger and contact wires, and the sags and tensions at different temperatures, were made in the following way:

As the catenary is very flat, the error in the use of the equation of a parabola rather than the true catenary, is well within the limits of error made in the erection of the line.

$$T = \frac{wL^2}{8y} \dots \dots \dots (1)$$

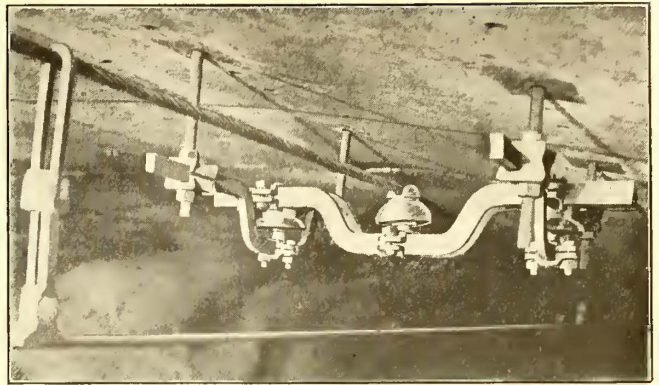
T = tension in pounds
w = weight per foot in pounds
L = length of span in feet

$$s = L + \frac{8}{3} \frac{y^2}{L} \dots \dots \dots (2)$$

y = sag in feet
s = length of wire in feet

$$E = \frac{Ts}{MA} \dots \dots \dots (3)$$

E = elongation in feet, due to stress only
M = modulus of elasticity
A = area of cross-section in square inches



CANADIAN NORTHERN OVERHEAD CONSTRUCTION—MESSENGER SUPPORT IN MONTREAL TUNNEL

To determine the sags and corresponding tensions at certain temperatures under different conditions of loading, it is necessary first to assume as a working basis the sag desired at normal temperature, usually 70 deg. Fahr. As an example of how the calculations were carried out we will take the 1/2-in. steel messenger and figure the sags and stresses for different loads.

Normal temperature	70 deg. Fahr.
Sag at normal temperature	20 in.
Span length	150 ft.
Weight per foot, messenger, contact wire and hangers	1.25 lb.
Assumed ice load, per foot	2.32 lb.
Assumed wind load, per square foot	9 lb.
Area cross-section of messenger	0.15 sq. in.
Modulus of elasticity of messenger	26 × 10 ⁶

From equation 1 in the preceding column, the tension under normal conditions is:

$$T = \frac{wL^2}{8y} = \frac{1.25 \times 150^2}{8 \times 1.67} = 2100 \text{ lb.}$$

The length of the messenger at normal temperature and under normal load is found from equation 2:

$$s = L + \frac{8}{3} \frac{y^2}{L} = 150 + \frac{8}{3} \frac{1.67^2}{150} = 150.05 \text{ ft.}$$

The elongation of the cable due to normal stress is next figured from equation 3:

$$E = \frac{Ts}{MA} = \frac{2100 \times 150.05}{10^6 \times 26 \times 0.15} = 0.081 \text{ ft.}$$

Subtracting this elongation from the length under normal conditions gives the unstressed length at normal temperature if the cable had no weight and there were no load on it. The unstressed length at any temperature is:

Unstressed length at normal temperature × (1 ± coefficient of expansion × degrees Fahr. above or below normal).

Unstressed	150.05 - 0.081 = 149.970 ft.
At 70° Fahr., length	149.97 (1 - 0.0000064 × 110) = 149.864 ft.
At -40° Fahr., length	149.97 (1 + 0.0000064 × 40) = 150.008 ft.
At 110° Fahr., length	149.97 (1 - 0.0000064 × 60) = 149.912 ft.

Curves can now be drawn, see Fig. 3 on page 1028, with sags as abscissas and tensions as ordinates; a separate curve for each temperature, as follows:

Curve for -40 deg. Fahr.: $E = \frac{Ts}{MA} = \frac{149.864T}{26 \times 10^6 \times 0.15} = 0.0000384T$

Assuming suitable values for T, we find the corresponding values of E, which, added to the unstressed

TEMPERATURE-SAG-TENSION DATA FOR 150 FT. SPAN STEEL MESSENGER.

Temperature Deg. Fahr.	Messenger Only		Messenger with Hangers and Single Trolley Wire	
	Sag	Tension	Sag	Tension
-20.....	5 1/4 in.	3,150 lb.	12 in.	3,520 lb.
-10.....	5 3/8 in.	2,910 lb.	12 3/4 in.	3,320 lb.
0.....	6 3/8 in.	2,690 lb.	13 1/2 in.	3,130 lb.
10.....	7 in.	2,460 lb.	14 1/4 in.	2,960 lb.
20.....	7 3/4 in.	2,250 lb.	15 1/8 in.	2,800 lb.
25.....	8 in.	2,143 lb.	15 3/8 in.	2,715 lb.
30.....	8 3/8 in.	2,045 lb.	16 in.	2,640 lb.
35.....	8 3/4 in.	1,945 lb.	16 1/2 in.	2,560 lb.
40.....	9 1/4 in.	1,850 lb.	17 in.	2,485 lb.
45.....	9 3/8 in.	1,755 lb.	17 1/2 in.	2,415 lb.
50.....	10 3/8 in.	1,657 lb.	18 in.	2,350 lb.
55.....	10 7/8 in.	1,565 lb.	18 1/2 in.	2,280 lb.
60.....	11 1/2 in.	1,485 lb.	19 in.	2,215 lb.
65.....	12 1/8 in.	1,410 lb.	19 1/2 in.	2,255 lb.
70.....	12 3/8 in.	1,341 lb.	20 in.	2,100 lb.
75.....	13 1/8 in.	1,270 lb.	20 5/8 in.	2,045 lb.
80.....	14 1/4 in.	1,210 lb.	21 3/8 in.	1,995 lb.
85.....	14 3/4 in.	1,155 lb.	21 7/8 in.	1,945 lb.
90.....	15 3/8 in.	1,100 lb.	22 1/4 in.	1,898 lb.
95.....	16 3/8 in.	1,050 lb.	22 3/4 in.	1,855 lb.
100.....	17 1/8 in.	1,005 lb.	23 3/8 in.	1,810 lb.
105.....	17 3/8 in.	965 lb.	23 7/8 in.	1,765 lb.
110.....	18 3/8 in.	925 lb.	24 3/8 in.	1,728 lb.

leable iron sherardized. The yokes are of 2 in. x 5/8-in. and 1 1/2-in. x 7/8-in. mild steel, painted with an asphaltum compound as a protection against rust.

Two No. 0000 phosphor-bronze trolley wires hang side by side from the messenger. Hangers on each trolley wire are spaced 15 ft., or 7 ft. 6 in. between adjacent hangers. The hanger lengths are given in Fig. 1. The two hangers nearest the messenger support, namely those 11 1/4 in. and 13 3/4 in. in length, are made with two loops, one sliding inside the other, so that the top loop cannot rise over the messenger, where the clearance to the roof is very small. The remaining hangers are similar to those used outside the tunnel, except that the loop is wider in order to take the larger messenger. It was found that the two messenger cables and the four trolley wires over the two tracks in the tunnel would give ample conductivity, so that no feeders through the tunnel were required. Both the messenger and trolley wires are anchored every half mile. Two "bridles" of 1/2-in. steel strand are fastened to the messenger by means of six 7/8-in. Crosby clips, and the ends of these bridles fastened each way, through two cemented-type strain insulators in series, a turnbuckle and wedge grip, to roof plates held by a bolt of the messenger support. The trolley wire is anchored by lapping the ends for a distance of one span and then carrying each end up and slightly to one side of the center, making fast to a roof plate through two insulators, a turnbuckle and a wedge grip.

At the only curve in the tunnel, one of 2 deg., two pull-offs are placed in each span, over each track, one for each of the trolley wires. The pull offs are fastened to the tunnel arch through two strain insulators in series by means of an expansion bolt. Two pull-offs are placed 7 ft. 6 in. apart, and the nearer one about 22 ft. from the messenger support. This spacing keeps the two trolley wires sufficiently close together and at the same time the pull-offs are far enough apart to prevent hard spots.

The writer was ably assisted in the construction of the catenary system by C. G. Lovell, J. F. Faber and W. T. Leslie. The phosphor-bronze trolley wire and tunnel messenger cable were obtained from the Standard Underground Cable Company of Canada; the insulators from the Locke Insulator Manufacturing Company, and the hangers, tunnel messenger supports and all the special line material from the Canadian General Electric Company.

Higher Fares Granted to New York Lines

Public Service Commission for Second District Authorizes Rate Increases to Six Cents for Five Petitioners—One Line Gets Seven-Cent Fare

FAVORABLE action has been taken upon six of the score and more applications for higher electric railway fares before the Public Service Commission for the Second District of New York. To the authorization of an increase from 5 to 6 cents for the Huntington Railroad, Amityville, L. I., which was noted in the ELECTRIC RAILWAY JOURNAL of Nov. 24, page 946, the commission has now added grants of authority for increases by the Hornell Traction Company, the Hudson River & Eastern Traction Company, the Ithaca Traction Corporation, the Orange County Traction Company and the Northport Traction Company. In all these cases the unit fare has been increased from 5 to 6 cents, with the exception of the Hudson River & Eastern Traction Company, to which is granted authority for a 7-cent fare.

The full opinion of the commission in the Huntington Railroad case, which covers 175 typewritten pages, is not yet available. Moreover, the complete details of the fare increases in the other cases cannot be secured as yet, although the authorization of most of them has been announced in the weekly tariff bulletin of the commission.

According to this bulletin the local one-way fare between points within the limits of a fare zone for the Hornell Traction Company was, on Dec. 4, increased from 5 cents to 6 cents. The fare for a book of twenty tickets, good between Hornell and Cook's Switch or between Canisteo and Crittenden, was increased from \$1 to \$1.20. A monthly commutation ticket book, good for one round trip between Canisteo and Hornell each working day during the month, will be sold on a basis of 20 cents per round trip.

Within the village of Ossining, the cash fare of the Hudson River & Eastern Traction Company was, on Dec. 1, increased from 5 to 7 cents. Strip tickets will be sold as follows: Four for 25 cents, sixteen for \$1, and eighty for \$5. Ten-coupon school ticket books, each coupon good for one ride, will be sold for 35 cents, and a twenty-coupon book of the same sort for 70 cents.

The local one-way fare of the Ithaca Traction Corporation, effective Dec. 1, was advanced to 6 cents between all points where a 5-cent fare had theretofore applied. The joint one-way fare in both directions between points on all divisions (except the East Ithaca division) and Remington (on the Central New York Southern) was increased from 5 to 6 cents.

In the case of the Orange County Traction Company, the local one-way fare was increased from 5 to 6 cents between points within the city of Newburgh, between Newburgh and Balmville, West Newburgh, Orange Lake Park, West Walden and Walden; and between Balmville and West Newburgh, Orange Lake Park, West Walden and Walden. These rates became effective on Nov. 29.

In its November issue of *Safety* the Union Traction Company of Indiana, Anderson, Ind., states that 528 of its employees subscribed to \$37,500 of bonds of the second Liberty Loan.

State Aid for Physical Improvements

Chairman Macleod of Massachusetts Commission Suggests That in Rehabilitation Through State Credit Lies One of Best Hopes of Improving Financial Results of Electric Railways—Freight Service Should Be Developed—Fare Increases Are Not Panacea for All Evils

THE development of freight service and the advancement of rehabilitation funds to electric railways by the State were recommended by the Massachusetts Public Service Commission through an address by Chairman F. J. Macleod on Nov. 28 to the Legislative investigating commission on electric railways. Speaking on behalf of the full board, Mr. Macleod discussed various remedies proposed at hearings of the special commission, and concluded with the suggestion that for the period of the war at least the State's credit, under the supervision of proper authorities, might well be placed at the disposal of electric railways having clearly demonstrated needs.

COMMISSION IS NOT MANAGING THE RAILWAYS

Under the handicap of poor physical and financial conditions, Mr. Macleod said, the management of some of the Massachusetts electric railways has deteriorated. Recent improvements in types of cars, equipment and methods of operation which have not originated in Massachusetts have found their way into service there very slowly. The Public Service Commission has realized the difficulties with which the managers have been faced, and it has not attempted in any fare case to penalize a company because of unreasonable differences of opinion as to best methods of operation. But it has done and intends to do everything in its power to stimulate the roads to better management and to the adoption of every feasible improvement in methods which will tend to offset the need of increasing fares.

The Public Service Commission, however, is not managing the railways. "We do endeavor," Mr. Macleod stated, "to assure ourselves that the stocks and the bonds which the companies seek to issue are reasonably necessary for lawful purposes, that their books are accurately kept in accordance with the uniform classification of accounts, and that their physical properties are maintained and operated in a manner consistent with the public safety. We investigate accidents and complaints and hear petitions, and endeavor, as far as possible, to correct conditions found to be unjust and unreasonable, either to the companies or to the public which they serve. We require publicity of certain expenditures found by experience in the past to be specially subject to abuse. But no attempt is made or can be made to take the initiative from the owners of the roads and dictate the wages, salaries or fees which they shall pay, the concerns from whom or the terms upon which they shall buy, or the general methods of administration which they shall adopt.

"The utmost which the Public Service Commission has been able to do in this direction is to employ, on special occasions, high-grade experts for test investigations, as was done in the Bay State case and is now being done in the Boston Elevated case, in order that the people may have some opportunity to estimate the

general efficiency of the utilities and the possibilities of improving their financial condition by means other than an increase in rates, and in order that some stimulus may be given to the adoption of the most improved methods of management and operation. We are fully persuaded that many of the evils of the past have been possible because public supervising bodies were insufficiently informed in regard to general conditions, and as far as our means and our ability permit we intend to provide ourselves and the entire public with an adequate fund of knowledge."

HIGHER FARES GRANTED MANY COMPANIES

Massachusetts is the home of the 6-cent fare. The Warren, Brookfield & Spencer Street Railway was the first electric railway in this country to adopt this unit (April 13, 1905). The Public Service Commission, since its establishment in 1913, has after careful investigation permitted fifteen companies, or nearly one-half of the operating roads in the State, to make general increases in fares. Applications of the Holyoke, Springfield, Northern Massachusetts and Bay State railways are now pending. No company has been refused an increase, and in most instances the lines have secured substantially what they asked for.

Even higher units than the 6-cent rate have been permitted. The Norwood, Canton & Sharon, the Ware & Brookfield and the Worcester & Warren companies now have a 7-cent unit, and the Middlesex & Boston has a 7-cent unit on certain lines and an 8-cent one on others. Two companies, the Boston & Worcester and the Concord, Maynard & Hudson, have been permitted to try a mileage system, based on a 2-cent rate.

At present, out of a total of 2198 miles of line in the State, excluding the Boston Elevated Railway, the unit of cash fare is 5 cents on 904 miles, 6 cents on 1110 miles, 7 cents on 85 miles and 8 cents on 32 miles. On 67 miles the 2-cent per mile rate prevails. In addition, fares have been increased in not a few cases by introducing additional zones. For better or for worse, it was said, Massachusetts has gone farther with higher electric railway fares than any other State.

POWER TO SUSPEND RATES SHOULD BE RETAINED

According to Mr. Macleod, the chief suggestion of the railways appears to be that the Public Service Commission shall be deprived of the power to suspend changes in rates, pending an investigation in which the burden of proof shall be upon the company, and that the companies shall have full power to make such changes as they seem fit and carry them into effect at once, subject only to future revision by the commission, acting with limited jurisdiction, after an investigation in which the burden of proof shall be upon the complainants and also after a possible review by the courts of findings of fact as well as of law.

One fundamental weakness of this plan, the speaker said, rests in the assumption that a sure cure for all the evils of the electric railway situation lies in the raising of fares. In his opinion, it is fair to say that no increase in electric railway rates in Massachusetts has fulfilled expectations. The companies which introduced the 6-cent fare ten years ago are financially no better off to-day than companies of similar characteristics which adhered to the 5-cent fare unit. In 1914 the Middlesex & Boston line was permitted to raise its fares. Yet it came before the commission again this year, with a financial condition not so favorable as in 1914, asking for the right to charge as high as 7 and 8 cents. In no respect is this company better off financially than the Bay State company, and in some respects its condition is worse. Increases in fares may help companies materially in some cases, but there is nothing in past experience which gives ground for the belief that all companies in the State can by this means be lifted into prosperity and good credit.

As to the power to suspend rates, the Public Service Commission holds that if this were removed, proceedings in rate cases would become more complex and protracted to the point of interminability. The suspension power is in use by the commissions of at least twenty-one States and by the Interstate Commerce Commission. Moreover, if the power of appeal to the courts on questions of fact were also included with the withdrawal of the suspension privilege, the commission would be reduced largely to a body for the taking of evidence.

To Mr. Macleod's mind, it seems an unwarranted assumption that a company must actually fail to earn a reasonable return before it can hope to be permitted to increase rates. The rule which the Massachusetts Public Service Commission has established is that a company must satisfy it that additional net income is needed in order that a fair return may be earned upon capital honestly and prudently invested. Presumably no company will undertake to increase rates unless it has definite reasons at least for believing that it probably cannot otherwise earn a fair return under the conditions likely to prevail in the immediate future, and that these conditions will have more than a brief duration. If these reasons are sufficient to lead a fair-minded man to such a belief, they will be sufficient to justify the commission in approving an increase.

The chief difficulty in many rate cases is not to recognize the financial needs of the carrier, but to determine whether the burden is being fairly apportioned among various localities and classes of riders. No good can come from the exercise of arbitrary action on rates by a company seeking to maintain public goodwill, without first doing all that can be done to make clear the justice of its undertaking. Any plan, therefore, involving the abandonment by the State of essential features of control now exercised over public utilities would not be in the public interest and would be likely to cause a reaction which in its ultimate results would be unfortunate for the companies themselves.

ABOLITION OF TAXES

Outside the Boston Elevated Railway, the Massachusetts electric railways pay the following taxes: Local property tax, assessed on real estate, \$457,993 in

1916; corporate franchise tax, assessed upon the market value of capital stock, \$392,057; excise, or commutation tax, based upon gross earnings, \$498,376. The Public Service Commission recommends that the excise tax be abolished and that companies be required to maintain in good repair, but not to renew, the street surface between their rails and tracks, or, at their option, to reimburse the municipalities for the cost of such work. Moreover, that when this surface is renewed, or replaced with a different form of paving, the companies may fairly be required to bear one-third of the labor cost, the municipality paying the remainder and the entire cost of all materials.

The corporate franchise tax and the local property tax do not amount to 4 per cent of the gross receipts, and the commission does not consider them excessive at present. It suggests, however, the possibility of giving temporary relief during the period of the war by exempting intrastate companies which pay in any given year dividends of less than 5 per cent on their common stock.

JITNEY SHOULD BE REGULATED

Some electric railways in Massachusetts have suffered severely from jitney competition. While there may be a legitimate field for such carriers, they certainly ought not to be permitted to go into a locality already supplied with railway facilities and pick off the cream of the short haul traffic in favorable weather, without being subject to any of the duties, restrictions and regulations of the railways. If experience has proved anything, Mr. Macleod averred, it is that unfair and ruinous competition is bound, in the end, to react upon a community. Jitneys should be subjected to regulation, preferably along the lines of the New York law. The commission feels that electric railways might well be authorized to supplement their service by motor-bus operation.

COMMISSION DOES NOT FAVOR CONTROL OVER LABOR

P. F. Sullivan, president Bay State Street Railway, has suggested that all labor disputes should go to the Public Service Commission and that every electric railway employee, upon entering the service, should be required to sign an agreement that any dispute as to wages should automatically be referred to the commission. In the commission's judgment such a policy would be ruinous to the present system of public regulation and ought not to be considered. Chairman Macleod pointed out that the commission already has to face continually perplexing questions of law, public policy, finance, engineering, accounting and operation. Add labor disputes and the commission would be plunged into extended consideration of standards of living, cost of living, skill and hardship of employment, hours of labor, discipline and so on *ad infinitum*.

Not only would it administer the law, but it would be obliged to make law on its own account. No one has yet hit upon any clear or simple rule for the determination of fair wages. The Legislature would not undertake to lay down any such rule, and the commission would be forced to formulate its own guiding principles. In short, the addition of labor disputes to the work which the commission already has to cover would be demoralizing in the extreme. It could not be effec-

tively handled, and it would tend to throw the commission more and more into politics and diminish confidence in the system of public regulation.

ELECTRIC LINES SHOULD HAVE POWER OF EMINENT DOMAIN

Probably because of steam railroad influence, electric railways in Massachusetts have been kept rigorously upon the highways. Some of the unprofitable long country lines could be made to pay if they were built for high-speed operation, so that interurban traffic might be attracted. The board believes that the electric lines should have additional power to acquire and operate upon private right-of-way. It is surprising that the companies have never seemed to attempt with any vigor to improve this situation.

TIME FOR REHABILITATION AND DEVELOPMENT

Broadly speaking, Mr. Macleod remarked that the electric railways of Massachusetts are in need of rehabilitation. Track, power, shops and rolling stock are not capable of furnishing good or economical service. One of the chief reasons for popular opposition to increases in fares lies in this fact. Moreover, it is costing the companies money every day in loss of traffic and increased operating expenses. Unless worn out or obsolete property is replaced the situation can only go from bad to worse. In rehabilitation, therefore, lies one of the best hopes of improving financial results. If modern equipment, good tracks and efficient power supplies can be secured, the opportunities for cutting costs and increasing traffic will be very substantial.

The present situation is also favorable to a larger application of electric freight service. It appears that the steam lines are desirous of reducing rather than increasing the volume of their less-than-carload business and that the electric lines have an excellent chance, if properly equipped, to add to their receipts by furnishing expedited service at remunerative rates for such freight.

LIMITATIONS OF SERVICE-AT-COST PLAN

The recent formation of an association of owners of Massachusetts electric railway securities is a hopeful sign, in Mr. Macleod's opinion, especially if it means that investors are in future to play a more direct part in the conduct of their companies' affairs. This should be of great service in improving present conditions. The service-at-cost plan of this association [ELECTRIC RAILWAY JOURNAL, Nov. 17, page 920] has certain marked advantages, but caution should be exercised in applying it generally to all the electric railways of the State. The differences in risk, condition, etc., are very material. The plan suggested for Massachusetts differs from similar plans adopted elsewhere (Cleveland, Dallas, Des Moines, Kansas City) in that it is not designed for a single railway system but is intended for a State-wide application.

The increasing of rates is still in the experimental stage. If the service-at-cost plan, which contemplates the creation of reserve funds for the protection of dividends out of new contributions of capital and the fixing of depreciation charges by the commission, is adopted, care must be taken to avoid the danger, existent under the present scale of prices and generally abnormal conditions, of fixing fares which would be

unreasonable in themselves, resulting in a decrease of revenues, and which would be difficult of proper adjustment when conditions returned to normal.

When capital is so greatly needed for war purposes and the cost of it is so great, the use of new contributions of capital as reserve funds for the payment of dividends to the full amount specified is at least of doubtful wisdom as long as present abnormal conditions continue. Moreover, it is difficult, if not impossible, to prescribe gradations in fares which may be generally applied to a large number of companies operating under a wide diversity of local conditions. If every fare adjustment should be the subject of renewed controversy, the confidence of the public and of investors would be impaired, and the speedy modifications in conformity to fluctuating financial results which the plan contemplates would be difficult of accomplishment.

STATE AID SEEMS THE BEST WAY OUT

If the people were prepared for it, the Public Service Commission holds, public ownership might be a solution, but it would involve readjustments and problems which would be serious enough at any time, and more than communities ought to be asked to cope with under the stress of present war conditions. The suggestion of the commission goes much less far. It suggests that the State should, for a limited period, act as the banker, supplying needed property upon an installment equipment-trust plan of purchase and giving the companies the benefit of its better credit and of the lower rates of interest which it is able to command. The scheme is one, of course, which has its limitations. It must be surrounded by proper safeguards and provision made for wise and conservative administration. Details will require careful study, but for preliminary consideration the following is suggested:

1. Title to the property furnished should remain in the State until the final installment has been paid.
2. In case of default on any payment, the State should have the option of ending the contract and taking possession of the property.
3. It should be provided by statute that, in case of a foreclosure or receiver's sale of the property of the company to which it has title, any purchasing electric railway must assume any remaining liability under the contract with the State.
4. The plan should be confined to classes of property where the element of security is good, such as rolling stock and power apparatus.
5. The opportunity ought not to be extended to every company. There are probably certain electric railways where reorganization is inevitable, or sale at a loss to some other company. The necessary line might be drawn by fixing some standard of past earnings or payment of dividends.
6. The process of rehabilitation ought to be gradual, especially in view of present war-time conditions. Only those changes and improvements should be made which are required by considerations of public safety or which offer the greatest promise of bettering necessary service and the financial results therefrom. Priority should be given to expenditures which have some direct relation to providing transportation facilities of immediate help in the prosecution of the war, such as perhaps expenditures for the extension and improvement of freight service.
7. Supervision of the proposed extension of State credit should be placed in the hands of the Governor and Council, acting with the advice of the Public Service Commission.
8. Where the new property took the form of actual additions and improvements to as contrasted with replacements of existing property, the annual payments to the State on principal account could be regarded as an offset to depreciation requirements.

The carrying out of this suggestion, Mr. Macleod said, would in no way deprive the companies of the

benefit of any other form of assistance, but it might open the way to secure physical improvements unattainable otherwise, and be of great advantage to the public as well as to the companies, perhaps in greater

measure to the former. By offering such help the State would, in the commission's judgment, go as far as it reasonably could in relieving the situation, as long as the present system of private ownership prevails.

Commissioner Garfield Recommends Fuel Economy

Co-operation of Electric Railways Asked to Eliminate Wasteful Uses of Electricity—New York City Service Cannot Be Reduced—Massachusetts Commission Suspends Car-Heating Rules

FUEL saving through the conservation of power used by electric railways is sought in a communication which the United States Fuel Administration has transmitted to the fuel administrators of the various states. These are urged to secure the co-operation of the companies in eliminating all wasteful uses of electricity. The communication reads:

"The Conservation Department of the Fuel Administration is investigating every possible opportunity to save coal, which, of course, includes the saving of electricity. An investigation convinces us that electric railways offer a chance for large savings, particularly through reductions in schedules. We are not suggesting changes in schedules which will seriously inconvenience the public, but it is a well-known fact that the pressure of private interests has, in many instances, led the electric railways to provide cars and service which represent a wastage that should be prevented in time of scarcity.

"It is Dr. Garfield's desire that you start this line of investigation for your State in consultation with the State Public Utilities Commission, assuring it that any reduction which it believes to be reasonable will have a full backing of the federal government as represented by the Fuel Administration.

"In addition to this matter of schedules, our attention has been directed to a number of other opportunities for economy on the part of electric railways. One of these has to do with the heating of the cars. We urge that you ask the proper state authorities to co-operate in the reduction of unnecessary heating. It has been stated that the heating of cars represents nearly 30 per cent of the current used by these companies. May it not be possible to make a substantial saving in this item?

"Furthermore, we have found that in many cases the system of power stations could be revised with large savings of fuel, as is said to have been done in Great Britain. There are, along the lines of railways operating in thickly populated districts, company power stations with more or less obsolete or inefficient equipment which could, we judge, be discontinued or reserved as relay stations through arrangements for the railways to obtain their power from more efficient stations of other public utilities operating in the same localities and having large relay capacity.

"If the public utilities which produce power at the lowest cost could be used to furnish the regular current

requirement of the railways in such districts, and the railway plants merely maintained as relays, the saving in electrical power and, therefore, in coal would be considerable.

"We would like to add that all of these companies should be urged to renewed vigilance in the matter of scientific economy in firing their power plants and the cutting off of every kind of leakage and wastage, especially in their transmission systems. We shall be glad to hear that you have taken up this matter vigorously and that you have found it possible to effect considerable savings in this department."

Attitude of New York City Commission Car Service Will Not Be Reduced, Owing to Congestion—Heating Tests to Save Coal Now Being Made

WITH reference to the suggestions for fuel economy from the National Fuel Administration, noted above, it is said at the offices of the Public Service Commission for the First District of New York that there is no possibility of a reduction in service in New York City. The transportation in the metropolitan district is now and has been so congested for years past that the city and the companies are spending about \$350,000,000 to relieve conditions. Conditions are so serious as to require additional facilities at the earliest moment rather than a reduction in the use of present facilities. The Interborough Rapid Transit Company has ordered nearly 500 new cars for use on the new Lexington and Seventh Avenue lines, for which the government is being urged to grant priority in the fabrication of the necessary steel.

As to the reduction in the use of electricity for the heating of cars, tests are now going on with the Brooklyn Rapid Transit System, under the direction of inspectors of the commission, to determine whether a saving can actually be had in electricity for this purpose. At a hearing on Dec. 4 the engineers of the commission reported that figures had been gathered for several elevated lines and for different types of cars on one surface line, but that sufficient data had not been secured for collation. It is desired to find out how long cars would stay heated in rush-hour operation, when sent out at a certain temperature from the car house, and what, if any, additional heat would have to be turned on during operation at different stages of

outdoor temperature. Another hearing is scheduled for Dec. 12.

The indications are, it is said at the commission's offices, that the board will go very slowly in allowing any substantial reduction in heat, until more progress has been made in the elimination of non-essential business and a reduction of luxury trains on the railroads. The public, which is entirely dependent upon the surface and rapid transit lines of New York City, is believed to be entitled to a reasonable amount of heat.

In regard to the more efficient use of power plants, the commission has directed attention to the fact that following the coal shortage of the Interborough Rapid Transit Company last August, the board took up the matter of having all power plants of the city tied together. At a hearing a week ago Frank Hedley, vice-president and general manager of the company, submitted preliminary data covering the mechanical features of bringing together the power plants of the Interborough, Brooklyn Rapid Transit, New York Edison, Brooklyn Edison, Pennsylvania, Long Island and possibly the New York Central systems. These data will be studied by all the engineers concerned to find out what may be practicable features of the plan. The

arrangement, however, is understood to be designed for emergency operation, and not with the view of a greater utilization of the most economical power plants.

Massachusetts Curtails Car-Heating

FOLLOWING a conference last week with various electric railway operating officials, the Massachusetts Public Service Commission has suspended car-heating regulations until April 15, 1918. Cars will be heated, unless otherwise ordered, as the judgment of the operating companies dictates.

On Oct. 13 the commission withdrew the usual heating rules to save coal, and the heating of cars was made optional with each company until Dec. 1. The weather continued mild until late in November, when car heating was resumed on a moderate scale in the colder hours of the day. Very little serious complaint appears to have arisen from the traveling public.

The continued suspension of the rules is in part at the request of James J. Storrow, Fuel Administrator of New England. The indications are, it is said, that this section will be short of the usual supply of bituminous coal by 7,000,000 tons on Jan. 1.

Publicity Among the Bostonese

How, Since the Earliest Days of Publicity Work, the Boston Elevated Railway Has Developed a Conservative System Suited to the Local Public

NINETEEN years ago the Boston (Mass.) Elevated Railway, as a pioneer among electric railways, took up publicity work. The company did not know exactly what results ought to be expected or how any were to be secured. The man selected to handle the work had not had any newspaper experience, and he knew as little as the company about what was wanted. Nevertheless, he broke into the work with the general understanding that he was to experiment in regard to securing better relations between the company and the public.

Since that time the company has developed an extensive publicity system designed to meet the peculiar needs of Boston. The public in that city, it is said, is conservative; it is serious-minded; it is critical of the form of statements as well as their subject matter. Consequently, the company has kept its publicity work from being tinged with what might in Boston be considered revolutionary or radical elements. For example, the "live-wire" style of writing—the "pep" that characterizes so much of present-day advertising and publicity work—has been used sparingly if at all in Boston.

GIVING SERVICE TO THE NEWSPAPERS

During the many years in which J. Harvey White as publicity agent has been dealing with the Boston newspapers, his sole idea has been to *render service to them*. Newspapers want news; that is their stock in trade. Yet space means money to them; therefore Mr. White furnishes nothing that has not real news value. Nor does he try to use press agent methods. He just goes along, day after day, with reporters good, bad and indifferent, giving out what they know they want or he

knows has a public interest. The papers get what they want, and they get it when they want it. Matthew C. Brush, president of the company, is strongly in favor of the fullest, frankest publicity.

In bringing the rather routine matters to the attention of the newspapers, Mr. White sends out "flimsies" containing the bare facts. The information is in such clear, compact news form that it steals no space, is easy to rewrite and can be used by the editors as they see fit. Even minor day-to-day material receives general publication.

When reporters call for information, Mr. White always sees them immediately and almost invariably gives them in full the stories they were sent out to get. If he cannot, he gives explicit reasons for not furnishing the information. Or, if the reporter is a new man, Mr. White calls up the city editor and explains the situation, thereby usually securing the reporter's release from the assignment.

Detailed technical stories, of course, Mr. White furnishes himself, written either in the usual newspaper style or in the form of a strictly official statement of facts. For the occasional out-of-the-ordinary news story, Mr. White formerly supplied copy to assist the newspapermen. Now, however, he as a rule simply calls up the city editors and gives them a tip, in order that the papers may handle the story in their own way. In the case of an extremely important story, Mr. White takes the matter up directly with the newspaper publishers. In other words, he aims at all times to give the papers what they ask for or would want if they knew about it; and the bigger the story he has, the higher the newspaper man to whom he renders his

Changes Effective Sunday, April 15, 1917

Beginning Sunday, April 15th, the trips operated between North Cambridge carhouse and Dudley St. via Mass. Ave. will not be operated between Harvard Sq. and North Cambridge but will be made a part of the line from Harvard Sq. to Dudley St.

April 9, 1917

EDWARD DANA, Manager Surface Transportation

BOSTON PUBLICITY—FIG. 1—SAMPLE OF CAR CARDS USED TO ANNOUNCE OPERATING CHANGES

service. As a result, the company has no trouble in getting its news matter used extensively and satisfactorily in nearly every case.

Mr. White is authorized to talk to the newspapers at his discretion, but on important matters of policy, statements are either made or approved by the president. Any responsible official may receive authority to make a statement to the newspapers, but ordinarily the president is the only one who exercises such power. His statements may or may not go through the publicity department. If an accident occurs, the superintendent in charge may tell the reporters if he sees fit. When a newspaper desires a story about some particular piece of work, the reporter may be turned over to the official in charge. These exceptions, however, only emphasize the general rule that material for the press must pass through the publicity office of the company.

Mr. White does not maintain any elaborate filing system covering the company's activities. It is felt that this would require extensive equipment and a large staff, and would simply involve a duplication of material already in departmental files. The cost would be out of all proportion to the worth. Nor would it be advisable to try to run a filing system in a small way, for the material would be inconclusive and quickly become obsolete. The best way to secure data for general use in regard to track work, car equipment, subway construction and the like, in Mr. White's opinion, is to call up the head of the department in charge. In this way he secures authoritative, up-to-the-minute information almost in the twinkling of an eye.

Why be petty? That is Mr. White's view of a hypercritical examination of newspapers to discover misstatements. When he sees an incorrect statement, he occasionally telephones the editor in order to point out the mistake in a friendly way, but only in the most important cases does he ask for a correction. He does not believe in being a nuisance around editorial offices.

LITTLE PAID ADVERTISING NOW

The company carries on a moderate advertising of time-tables in suburban papers, to which it pays a flat amount quarterly, something more than the cost of composition. These papers are all weekly publications.

Formerly the company also purchased large amounts of advertising space for getting business, announcing traffic-handling methods and stating its policies. For the last three or four years, however, no sums have been paid out for such purposes. Two reasons have existed for this; first, that the company in the exercise of the most rigid economy possible has been avoiding all expenses not absolutely necessary to the operation of the road, and, second, that the Massachusetts Public Service Commission has given companies to understand

that the expenditure of money must be justified on public grounds.

The commission requires a quarterly statement from reporting companies, showing all contracts or agreements made with reference to advertising, publicity and legal or other work in any way connected with legislation or attempting to influence or inform public opinion. The commissioners are disposed to question advertising on the basis that the company funds might be used otherwise so as to count for more to the public. If they could be shown that the expenditure of a certain sum for advertising would be of greater benefit than its use in car operation, they would sanction such expenditure. The only case where the Boston Elevated Railway has raised the issue, however, was in February, 1915, when the commission informally stated that a certain expenditure for advertising in a safety campaign would be deemed in the public interest.

CO-OPERATING WITH THE COMMISSION

The work of establishing better relations with the Public Service Commission, and similarly with boards of aldermen and local civic organizations, is not handled by the publicity department. The company tries to keep in touch with these through operating officials.

For example, when a case is being heard by the commission, H. B. Potter, assistant to the president, attends and speaks for the company in most matters ex-

BOSTON ELEVATED RAILWAY COMPANY

ANNOUNCEMENT OF CHANGES

In compliance with the Order of request of the Boston City Council as recommended by the Street Commissioners and approved by the Mayor in order to relieve the congestion on Washington Street caused by holiday shoppers, cars will not be operated on Washington Street between Essex and Milk Streets from 9 A. M. to 7 P. M. beginning Monday, Dec. 4th, 1916, and continuing until Jan. 13, 1917.

Cars operated on the Longwood Ave. Rowe's Wharf line, the Columbus Ave. Rowe's Wharf line, the Tremont Street Rowe's Wharf line and Dudley Street-South Station line will be operated via Kneeland Street, Harrison Avenue and Essex Street to Washington Street.

Cars operated on the Dudley Street-Franklin Street line, the Grove Hall - Hampden Street line, the Upham's Corner - Mass. Ave.-Franklin Street lines and the Broadway Extension - South Boston lines will also be operated via Kneeland, Harrison Ave., Essex Street to Washington Street.

Passengers may transfer from cars on these lines at Beach Street Elevated Station to and from Atlantic Ave. elevated trains and may transfer at Essex and Washington Streets to and from Washington Street Tunnel trains.

Cars operated on Dorchester Ave. or Summer Street Extension lines which are regularly operated through the portion of Washington Street affected will be operated via Federal Street, Franklin Street, Hawley Street and Summer Street. Passengers on Dorchester Avenue or Summer Street Extension lines may transfer to and from the Cambridge Subway trains at South Station Under to reach the shopping district and points upon the rapid transit system.

Local surface car service will be operated between South Station and Rowe's Wharf via Atlantic Avenue and between South Station and North Station via Federal Street and Post Office Square.

The congestion during the holiday season has increased each year and the Company is heartily co-operating with the authorities upon a matter of such concern to so many persons, and anticipates that its patrons will assist in making the temporary relief successful.

Further detail information may be obtained from the Traffic Dept., Room 901, 101 Milk Street. Tel. Main 5700.

EDWARD DANA,

Nov. 29, 1916.

Supt. of Traffic.

BOSTON PUBLICITY—FIG. 2—SPECIMEN HANDBILL TO INFORM RIDERS ABOUT REROUTINGS

cept those of a purely legal nature. For these an attorney appears. Edward Dana, manager surface transportation, goes alone or with Mr. Potter to hearings which deal with transportation subjects. It has been found to be a most satisfactory arrangement to send practical operating men rather than lawyers to discuss operating conditions before the commission.

Mr. Potter has personal charge of all commission matters. Perfect harmony and good-will is the aim in dealing with it. The company actively co-operates with the inspectors of the commission, and everything in its offices is open to them. Hearings before boards of aldermen are handled by Mr. Potter or under his direction. Company officials are members of the various chambers of commerce and co-operate in all their work.

GETTING FARE PUBLICITY

An excellent testimonial that the publicity of the company is frank and persistent, but not aggressive to the point of belligerency, may be found in connection with its plea in 1915 and 1916 for financial relief. The company needed more revenues, but it did not pick a fight with the public on this point. It simply presented its case in detail to the Governor and other public authorities, and gave a carefully prepared summary to the newspapers. When this was done, it sat back and waited for the public to act fairly in the matter.

The Boston newspapers almost unanimously came out promptly in favor of granting aid to the company, and there was no direct newspaper opposition expressed. As the industry knows, some relief has since been granted, but more is needed. The public authorities are continuing their investigation, however, and the company is co-operating to the fullest possible extent in furnishing, with persistent courtesy and promptness, all information desired. Yet it is making no "campaign" for higher fares. The public is sensible; it knows that the company needs help. Consequently, it is believed that better results in the long run will be secured if the company does not give the impression of fighting for its case but allows the public to volunteer its own solution. Such a procedure begets confidence on the part of the public, while undue urging of the company's case, or the appearance of an undue desire for haste, would be more than likely to beget suspicion.

USING POSTERS AND CAR CARDS

Besides reaching the public through the newspapers, as before described, the company uses other publicity media for certain purposes. When cars are rerouted or some other operating change is made, placards (9 $\frac{3}{8}$ in. x 28 in.) are placed a week in advance in the cars on the line or lines affected. These cards, one of which is reproduced in Fig. 1, are suspended in racks near the center of the cars. The company also places handbills in boxes on the cars or gives them to the conductors for distribution. These, as shown by Fig. 2, give full information regarding the proposed change. A "flimsy" containing the bare facts, of course, is given to the newspapers. The company never uses car cards in the regular advertising spaces or posters on windows.

The company, however, uses large posters in its elevated and subway stations on large signboards, the largest of three sizes being 5 ft. x 7 ft. On these boards are placed announcements inducing traffic, such as those covering summer park attractions, football games in the Harvard Stadium, the Automobile Show and other

features that continue for more than one day or can be covered in a seasonal poster. Each poster is expected to be kept in place for a week or more. The company is careful in using the posters not to compete with the newspapers and the local advertising agencies. Occasionally the boards are used for general topics, such as early Christmas shopping or, of interest lately, Army and Navy enlistment. As a rule, however, the signboards are for traffic purposes only and are handled by the traffic department. Mr. White sometimes co-operates in writing copy for the posters but has nothing to do with printing or displaying them.

PUBLIC HAS RIGHT TO KNOW

In the opinion of Mr. White, electric railways no longer are enterprises conducted by private individuals for unlimited profit. They have become instruments whereby the public supplies itself with a needed service without thought of high profit for private investors, but with due recognition of the necessity of a fair return on the property in service. The public through its public service commissions directs the operation of the railways, and it is fundamentally the responsible party back of the electric railway industry. Hence, Mr. White says, the companies have a very clear duty to keep the public informed as to what is being done and the reasons therefor. The public is entitled to full information; it is the duty of the publicity agent to present this in a form suited to local conditions. The result of carrying out this policy on the Boston Elevated Railway has been the gaining of the good will of the press to such an extent that while there is occasional criticism of the service, there is no hostility to the company or the men who manage it.

Women Conductors on New York Lines

First Group to Take Regular Runs About Dec. 10, Following a Short Period of Training

THE New York (N. Y.) Railways will place women in service as conductors on the surface lines about Dec. 10. It is intended not to displace men now in service but merely to fill the vacancies caused by the war. The women will first be employed on the low-level, center-entrance cars on which fare boxes are installed, the conductor's duties being principally to make change. They will in all probability be placed later on the other cars on which the fares are collected.

The women are now receiving instruction consisting of about two days in school and about four or five days on the cars under the supervision of an instructor. Those who qualify will then be placed in charge of cars and will work the same number of hours as the men. Nine applicants were in the first group to receive instruction, and thirty-three were enrolled in classes the following day. The girls are making their first trial runs as this paper goes to press. It has not been decided whether they will take late runs, as that will probably depend on labor conditions.

A uniform is being worked out with special features to make it most suitable for the needs of the service.

Employees of the interurban railways and utility properties of the Illinois Traction System, Peoria, Ill., to the number of 115, are now in the service of the government's military forces.

American Association News

War Board Issues Important Bulletins—President McCarter of Public Service Explains How Shortage of Men, Materials and Money Imposes Unprecedented Problems on the Public Utility

McCarter on "Needs of the Hour"

Nearly 1500 members of the electric railway, electric and gas company sections of Public Service attended a meeting in Newark, N. J., on Nov. 27, at which Thomas N. McCarter, president of each of the separate companies, spoke on the problems which confront the industry at this time. Before and after the address the Essex Division Trainmen's Band played several selections.

Mr. McCarter's talk was an intimate explanation of the difficulties connected with the conduct of Public Service affairs in particular and of public utility affairs in general. He paid a tribute to the 723 Public Service men already in war service and said that those who remained behind must carry the load of those who have gone to the front. When he addressed the combined company section one and one-half years ago on the occasion of the opening of the new terminal he had felt that the most difficult problems of the company were in the past, but the war has entirely changed the situation.

The three elements of public utility operation in which serious shortage now exists are men, materials and money. These are all so interrelated that shortage in one causes shortage in all. The lesson for all public utility employees is that they must "hew to the line of the closest economy." Under the present conditions it may be necessary to defer desirable improvements and even to let non-essentials of maintenance stand for a while. For example, the war must be won even if a car goes unpainted for a few months now and then. Above all, every employee must take upon himself the responsibility for doing each week more than a full week's work, if necessary.

Referring to the difficulty of securing capital for desired public utility improvements, Mr. McCarter analyzed conditions in the money market with reference to these properties, pointing out that there is now no incentive to investment in public utilities. The stock of first-class corporations has tumbled in value due to the lack of public confidence. In explanation of this condition it is often stated that the corporations are suffering for the sins of earlier days. The fact is, however, that we are not now concerned with what happened fifteen years ago, when the conditions may or may not have been as alleged; what we want to know is what is going to happen fifteen years hence. There are many ways in which the conditions of the public utility corporations can be ameliorated, and it is possible that the government may come to their relief. The users of electricity, gas and transportation can also help by spreading out their demands over longer periods, thus reducing the "peaks." Employees of the corporations can explain, as opportunity offers, the facts regarding the furnishing of service by their employers. Such facts, for example, as those given to his audience

by Mr. McCarter regarding the burden imposed locally by the excessive prices of coal can be passed on to a wider audience.

In conclusion, the speaker stated his conviction that the problems before the industry, however difficult, will be solved, but it will take continued and vigorous co-operation to insure their solution.

War Board Issues Bulletins

For the American Electric Railway Association War Board, Director C. Loomis Allen is sending out Bulletins No. 1 on coal conservation and No. 2 on public improvements.

The first is accompanied by a reprint of General Letter No. 18 of the United States Fuel Administration addressed to state fuel administrators, which appears on page 1033 of this issue of the ELECTRIC RAILWAY JOURNAL. The War Board bulletin contains eight suggestions as to possible ways in which electric railways can save fuel. They are in substance as below:

1. Eliminate unnecessary service.
2. Increase the use of skip-stops.
3. Reduce car heating, and
4. Waiting room heating.
5. Secure co-operation of industries in flattening load peaks by distribution of opening and closing hours.
6. Keep company movements off the load peaks.
7. Enlist the co-operation of motormen in efficient car operation. (Suggested pledge is appended.)
8. Operate power plants for best over-all economy in power production.

Bulletin No. 2 is based upon a letter from Hon. Newton D. Baker, secretary of war and chairman Council of National Defense, relative to the elimination of all unnecessary public improvements during the period of the war. Mr. Allen urges that the matter be brought by the electric railways before the public authorities of their respective communities.

Included with the bulletins is a letter on the subject of coal reports, calling attention to the data sheet issued last August. It was described on page 317 of the Aug. 25 issue of this paper. A duplicate of the data sheet (No. 173) accompanies the letter.

Section No. 9 Is Busy Again

At the first meeting of the season of the Cumberland County Power & Light Company section the following officers were elected for the ensuing year: President, C. W. Bent; vice-president, Charles Gilman; treasurer, W. W. Blake; secretary, Percy C. Pratt; trustee, F. F. McNeill. Cyrus S. Ching, superintendent of instruction Boston Elevated Railway, was the principal speaker of the evening. He talked on the relation of electric railway employees to the public. Five new members were added to the section.

The second meeting was held on Nov. 5 and was addressed by Lieut.-Col. F. W. Stopford, 303rd Field Artillery, Camp Devens, Mass., on the subject "Making Soldiers at Ayer."

Milwaukee Section's New Officers

Continuing the series of short articles begun recently giving biographical notes to depict the careers of the company section officers, the following is presented regarding Section No. 1.

F. A. Lubber, who was elected president of the Milwaukee Electric Railway & Light Company section on Nov. 8, was secretary of the section during the last year. At the present time his service with the com-



F. A. LUBBER
President,



LOUIS BEIHOFF
Secretary,

Milwaukee E. R. & L. Co. Section Milwaukee E. R. & L. Co. Section

pany is in the capacity of chief draftsman. He entered the employ of the company as architect in June, 1910, and previous to that time was associated with a prominent Milwaukee architect. Mr. Lubber has been a member of the American Electric Railway Association since 1911.

Louis Beihoff, secretary of the section, is bill clerk in the purchasing and stores department. He has been connected with the company for eleven years, beginning as messenger in the accounting department. Mr. Beihoff has also been interested for several years in the work of the association and has been most active in connection with the entertainments and other social work of the section.

Civil Engineers Open New Headquarters at New York

On Dec. 7 a general convocation of the American Institute of Mining Engineers, American Society of Mechanical Engineers, American Institute of Electrical Engineers and United Engineering Society was held at New York for the purpose of welcoming the American Society of Civil Engineers into the fraternity of the "founder societies" formerly comprising the United Engineering Society, and into occupancy of the enlarged Engineering Societies' Building at 29 West Thirty-ninth Street. A three-story addition has been completed upon the roof of the original building, giving the A. S. C. E. two fine floors for offices, reading room and directors' room, and accommodations for its library, now a part of the United Engineering Society's library. The American Electric Railway Association formerly had offices in this building.

COMMUNICATION

The Value of a Company Section

THE METROPOLITAN WEST SIDE ELEVATED
RAILWAY COMPANY,

CHICAGO, ILL., Nov. 22, 1917.

To the Editors:

Referring to your inquiry as to the results obtained from our company section, I take pleasure in stating as follows:

Our experience leads us to the conclusion that this organization is invaluable to the railway. It has done a tremendous amount of good for our men and our company. The important points in connection with the company section work as they appear to me are these:

1. Men attending the meetings from various parts of any system become acquainted personally during the social part of the meeting. These men exchange ideas; they become acquainted with conditions prevailing in different parts of the system. After they become acquainted personally any business done between them, either by telephone or correspondence, is handled more efficiently and to better advantage than before.

2. Members of the supervisory force have an opportunity to meet the heads of departments and officials of the company on an equal footing. As a rule the men desire to know their officials and to be able to meet them and talk with them outside of the daily routine. It is also a big advantage for the officials to get this personal contact with those reporting to them as it produces a better understanding and heartier co-operation.

3. The subjects for papers and discussions are selected so that the company section becomes a school of instruction. Each department gets acquainted with the work of all other departments. This broadens the experience and knowledge of all those attending the meeting, and makes each man more valuable to his employer on account of his increased knowledge and usefulness.

4. The meetings give the officials of the company a splendid opportunity to reach the entire supervisory force at one time in personal appeal in regard to any important subject or detail concerned in the efficiency of operation. As an example of what I have in mind our October meeting may be mentioned. This meeting was devoted to getting the supervisory force ready for the operation of coasting clocks. It would have been impossible to have presented this subject effectively without a meeting of this kind.

5. The individual who attends the meetings benefits by the broadening of his views and knowledge. Taking part in the discussions enables him to develop the ability to get upon his feet in a gathering and talk. The question box presents an opportunity for him to secure correct information upon points which are not clear to him.

6. The entertainment which is always mixed in with the more serious work gives the men an opportunity to get clean, wholesome recreation under good surroundings.

7. The company section is a very important factor in securing and maintaining the "morale" of the organization.

BRITTON I. BUDD, President.

EQUIPMENT and MAINTENANCE

HAVE YOU A GOOD WAY
OF DOING A JOB?

—*Pass It Along*

These Articles Have Been Selected to Provoke Thought and Stimulate Discussion. All of the Technical Departments Are Represented

Photographing a Tunnel Interior

An Effective Method Used in the Mount Royal Tunnel in Canada

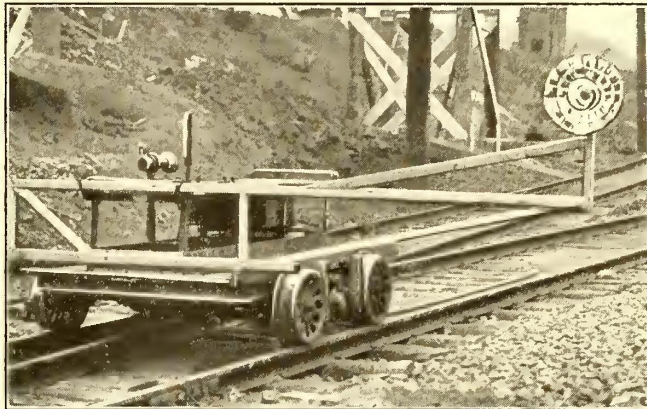
BY J. C. K. STUART

Assistant Engineer Mount Royal Tunnel & Terminal Company,
Montreal, Canada

Photography underground is at its best a disheartening job, but with practice and experience results can be obtained, even in tunnel photography, with very simple artificial lighting apparatus, that are almost as good as those obtained by daylight. This consists of a portable lamp with reflector, which is moved along to illumine successively all parts of the interior which is to be photographed.

The photographs used in Mr. Lancaster's article elsewhere in this issue show what can be accomplished by this plan, and a brief description of the apparatus and methods used to obtain these photographs is given in the following paragraphs:

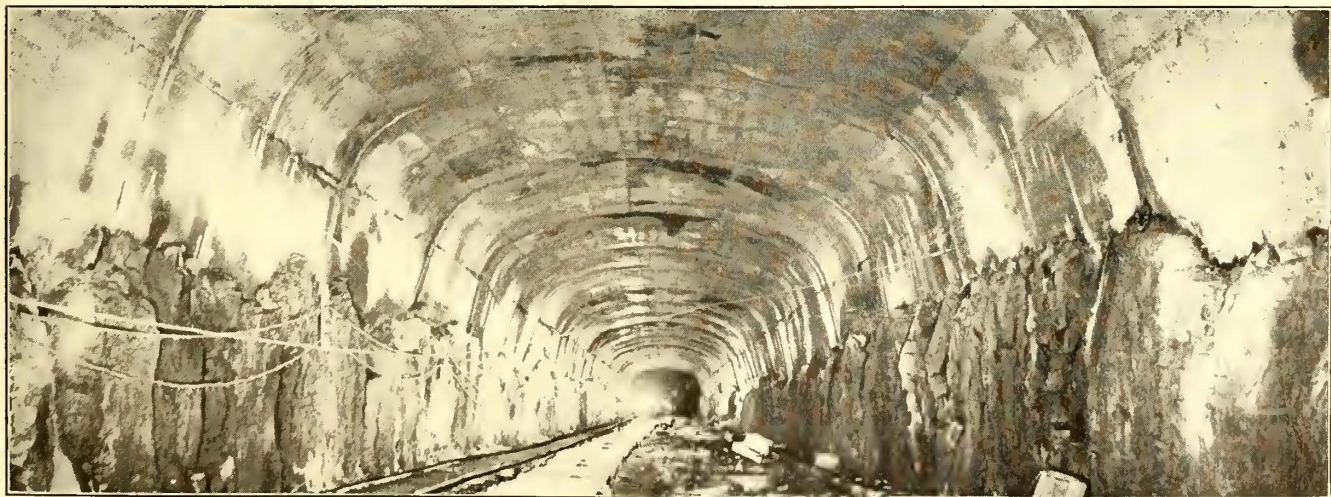
The camera needs no description—almost any type will serve—but an anastigmat lens of the cemented type will give negatives that are more brilliant than a lens of the air-space type under tunnel conditions. There is no need for a large aperture. Most of the photographs used by Mr. Lancaster were taken with the lens stopped to full. The plates must be backed or double coated. The lighting apparatus consists of a 1000-watt, 110-volt, tungsten, concentrated filament lamp mounted in a mirror reflector, designed in such a way that the light from it is very evenly diffused, with no concentrated ray, but only one small dark spot in



HAND-CAR WITH PROJECTION LAMP

the center of the circle of illumination. The reflector and lamp are shown in one of the photographs.

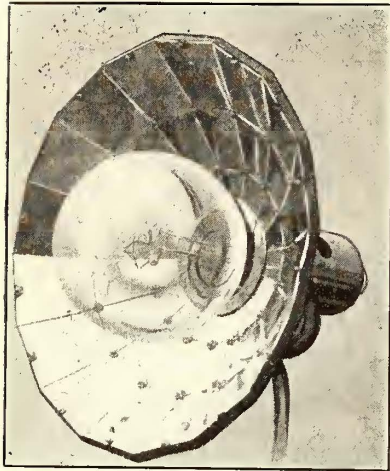
To obtain a long perspective of a tunnel ahead of the camera must, of course, be carried down the tunnel ahead of the camera and pointing away from it, thus illuminating every part of the tunnel successively, starting directly in front of the camera and ending, say, 1000 ft. from it, or whatever distance is required in the photograph. The lamp may be carried in the hand and current fed to it by a wire of the required length attached to the tunnel lighting system, but for long perspective views it is better to mount the lamp on a small push car connected to an electric locomotive about 250 ft. away by means of a light rope and a wire for furnishing the current to the lamp. The man attending the



MT. ROYAL TUNNEL INTERIOR PHOTOGRAPHED BY MR. STUART'S METHOD

lamp must keep his body between the lamp and the camera, or else the light from the ventilating holes in the socket will strike the lens.

If any hitch occurs during the taking of the photograph, such as the catching of the wire in the track, necessitating a stop, the lamp man puts out his lamp until all is clear, lighting it again as soon as he starts to move on.



REFLECTOR AND LAMP FOR TUNNEL PHOTOGRAPHY

A few experiments will give the right speed of the lamp for the correct exposure of the plate for different sizes of tunnel, but as the distance from the camera to the lamp increases the speed at which the lamp travels must increase.

To obtain proper exposure of the tunnel floor the camera must be set up as high as possible, but not so high as to dwarf the height of the tunnel in the photograph.

Sectionalization of Overhead for Three-Wire Operation

The Author Explains the Fundamental Principles Involved in Several Arrangements of Trolley Sections

BY E. R. SHEPARD

Associate Electrical Engineer United States Bureau of Standards, Washington, D. C.

There is a growing interest in the three-wire principle of power distribution for electric railway work as a means of reducing track gradients and energy loss in the return circuit. In the several installations where this principle has been employed, the primary object in adopting it has been the mitigation of electrolysis.

Electrolysis conditions, however, are so strongly affected by the trolley sectionalization that it is extremely important for the engineer wishing to experiment with or adopt this method of power distribution fully to understand the several effects produced by each arrangement of the trolley sections.

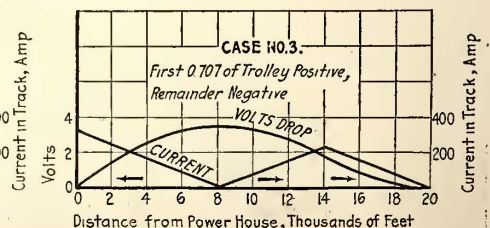
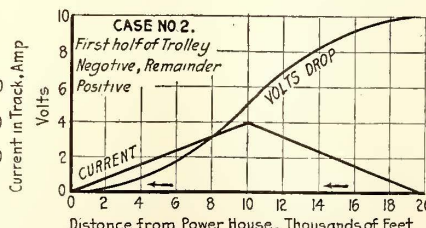
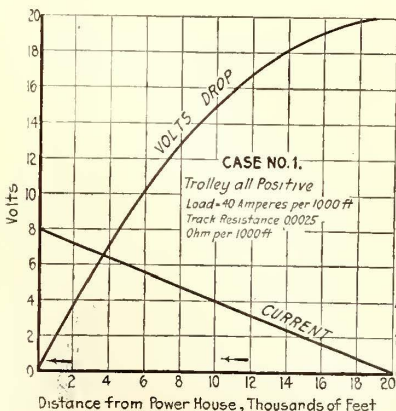
The accompanying diagrams show the track current and the voltage drop in the track for five different arrangements of the trolley sections as compared with conditions prevailing under normal or two-wire operation. The curves are based on the following assumptions: Twenty thousand feet of double track, the resistance of which is taken as 0.0025 ohm per 1000 ft. (100 lb. rails, well bonded); a load of 40 amp. per 1000 ft. of track, assumed to be uniformly applied. This is equivalent to a headway of between three and four min. each way.

Case 1 is that of normal operation with the trolley all positive. It is seen that the current on the track increases uniformly from zero at the end of the track to 800 amp. at the power house. This corresponds to a maximum gradient at the power house of 2 volts per 1000 ft. The voltage curve showing the drop in voltage from any point on the track to the power house is obtained by integrating the IR drop over the entire length of the track, its equation being that of a parabola. The total drop is seen to be 20 volts.

In Case 2 the first half of the trolley is supplied with current from a negative generator, and the outer half from a positive generator, a 1200-volt trolley breaker being required between the two sections. Under this arrangement the outer half of the track is uniformly collecting current, while from the first half the current is being uniformly withdrawn through the cars and returned to the power house over the negative feeder. The cars on one-half of the track are, therefore, in series with those on the other half, and no current is returned to the power house over the track or neutral conductor. In the practical application of this arrangement, as the cars move back and forth across the section breaker, there will be an unbalanced portion of the load at times which must return to the station or be supplied from the station over the track. The maximum track current, track gradient and overall potential are here only one-half as great as in Case 1.

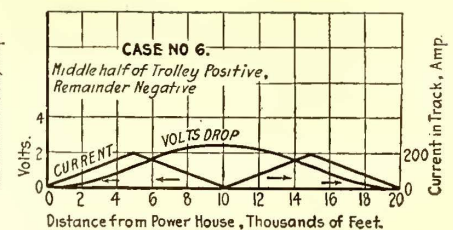
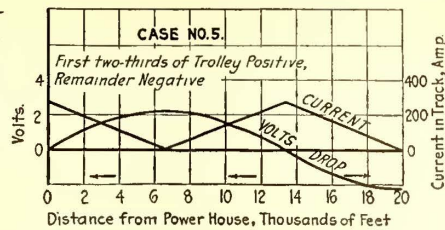
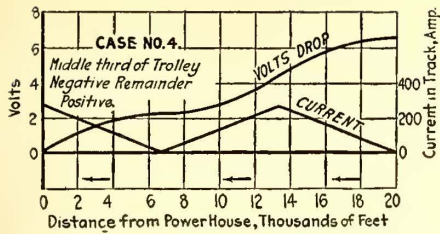
Where the traffic is frequent, as on city streets, the unbalancing is not serious and the average currents and potentials, which really determine electrolysis conditions, are not essentially different from those shown in the curves.

In Case 3, the first 0.707 of the trolley is positive and the remainder negative. This is the condition for a zero over-all potential. As shown by the arrows, there is an outward flow of current over a portion of the track and both extremities are at a lower potential than the intermediate region. The effect of this is to produce two positive areas in the underground piping systems and to require drainage of telephone and power cables at two points instead of one. Such a condition



DIAGRAMS OF CURRENT AND POTENTIAL WITH DIFFERENT TROLLEY ARRANGEMENTS

Case 1—Trolley all positive. Case 2—One-half of trolley positive, one-half negative. Case 3—Seven-tenths of trolley positive, three-tenths negative



DIAGRAMS OF CURRENT AND POTENTIAL FOR SEVERAL THREE-WIRE DISTRIBUTION PLANS

Case 4—Middle third of trolley negative, remainder positive. Case 5—One-third of trolley negative, two-thirds positive. Case 6—Middle half of trolley positive, ends negative

might be taken care of satisfactorily, were it not for the fact that the shifting loads which occur in practice cause the potential of the outer end of the track to fluctuate through rather wide limits. By shifting the trolley section breaker from the 0.707 position to the two-thirds position, as shown in Case 5, the potential of the outer end of the track falls to more than two volts below that at the power house. A slight shift of the breaker in the opposite direction would raise its potential correspondingly. It follows, therefore, that if pipes or cables are drained to the outer end of the track, as well as at the power house, under conditions similar to those shown in Cases 3 or 5, a shifting of the load will result in a fluctuation of the potential between these two points and an unnecessary transfer of current over the drained structures.

This objection is overcome in Case 4 where the middle third of the trolley is negative and the remainder positive. It will be seen that here the gradient is continuous from the outer end of the track toward the power house, although at one point it drops to zero. The maximum track current and over-all potential are reduced to one-third of the corresponding values of Case 1. Unless considerably more than one-third of the load be reversed there is no danger of getting two low-potential points on the track as occur in Cases 3 and 5.

Another arrangement of trolley sections is shown in Case 6, where the middle half of the trolley is positive and the two end sections negative. The track currents and gradients are here limited to low values, but the same objection is encountered as in Cases 3 and 5.

In locations where the outer end of the track extends into an undeveloped territory, with no underground structures present, this objection is not pertinent, and the arrangements shown in Cases 3, 4 and 6 may be employed with no bad consequences. The actual arrangement of the trolley sections in any particular instance where a two-wire system is being converted for three-wire operation will, of course, depend very largely upon the existing arrangement of the feeders. It will usually be desirable to employ these with as few changes and additions as possible, and they may easily prove to be the determining factor in the sectionalization of any system.

In the Omaha installation, which was described by E. H. Hagensick in the *ELECTRIC RAILWAY JOURNAL* for Nov. 10, the remote feeding sections were designed for negative polarity, principally because the layout of the feeders did not conveniently permit of any other arrangement. The electrical characteristics of this system are very similar to those shown in Case 3, and for that reason it was found desirable to resort to drainage of the telephone cables at some points. Some of the reversed sections, however, were in undeveloped terri-

tory, where no cables or gas pipes existed, and very few water pipes, and in these locations no drainage has been thought necessary.

In Springfield, Mass., where the system is being modified for three-wire operation, a middle zone was selected for negative polarity, and it is believed that the conditions will closely approximate Case 4. This arrangement was, however, necessary from an entirely different consideration. Some of the outlying sections were supplied by feeders which acted also as tie lines to substations some miles distant on the interurban lines, and it was therefore necessary to maintain these at the normal or positive polarity. A zone immediately adjacent to the power station is also to be supplied from positive generators, leaving a middle zone for reversed polarity.

Where tracks closely parallel each other, as on adjacent streets, they should be of the same polarity. With one positive and the other negative, the currents would flow in opposite directions in the two tracks and give rise to high gradients through the earth between the extremities of the two feeding sections. If, however, the parallel tracks are sufficiently close together to permit of cross-bonding between them, this arrangement would be ideal, as the cross-bonds would equalize the potential between the tracks and prevent the flow of leakage current.

Where the three-wire principle is to be employed as a means of electrolysis mitigation, and no other consideration would seem to justify its adoption at this time, too great care cannot be given to the matter of the sectionalization of the trolley.

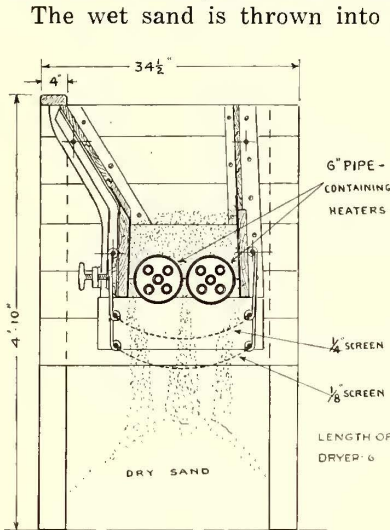
Electrically Heated Sand Dryer Used in Vancouver, B. C.

Low Rate for Electric Energy Makes It Practical to Use Electric Sand Dryer in Place of Coal Stove

Drying sand electrically has been found by the British Columbia Electric Railway to be more economical than the use of a coal-heated dryer. The electrical dryer which has taken the place of the coal stove is shown in the two illustrations. It consists essentially of a wooden hopper, the lower half of which is lined with sheet iron backed by asbestos. In the bottom of the hopper are two 6-in. iron pipes, each containing five heater units connected in series. Each section unit consists of a piece of 3/4-in. iron pipe wrapped with four layers of 1/64-in. asbestos tape, over which are wound 540 turns of No. 16 gage soft iron wire. The wire is wound eight turns to the inch.

The heating units are supported by means of marble blocks which fit into the ends of the 6-in. pipes. Besides the holes in which the heating units rest the

marble blocks have small vent holes to allow any moisture in the pipes to escape. One unit in each set is coupled at the back end of the box so that it can be used for heating water for washing purposes. Under the hopper are two wire mesh screens about 4 in. apart and suspended by means of hooks so that when necessary to clean them they can be dropped from one side and the screening collected on the sheet below.



CROSS-SECTION OF ELECTRICAL SAND DRYER

The wet sand is thrown into the hopper at the top and as it dries it finds its way by gravity through the 1/2-in. openings around the heaters. It flows in a steady stream through the screen to the floor beneath, and after the hopper has been filled no attention is necessary except occasionally to stir the sand with a stick. The steam from the wet sand passes upward, warming the sand in preparation for drying. In order to prevent the

wet sand from packing in the hopper the side walls are spread so that the bottom is about 2 in. wider than the top. In addition some adjustment of the sloping side walls is provided by adjusting screws on the front side of the hopper.

The hopper holds about 2/3 cu. yd. of sand and will dry two and one-half charges in nine hours. The current consumption is 16 amp. at 550 volts or 8.8 kw. The cost of power is 1 cent per kilowatt-hour so that the rate for drying the sand electrically is 47 1/2 cents per cubic yard. The sand stove previously used held 0.46 cu. yd. and required 275 lb. of soft coal to dry one charge. At \$6.50 per ton the cost of drying sand by this method was \$1.90 per cubic yard. In addition to the necessity for tending the fire there was a further labor cost of screening the sand after it has been dried. In the electric dryer this is taken care of automatically.

An advantage of the electric dryer is that the tem-

perature can be easily regulated and kept at the proper point, whereas with the coal dryer it was difficult to regulate the fire and often the sand was burnt. The cost of the electric dryer complete and installed in place was less than two-thirds that of the coal stove.

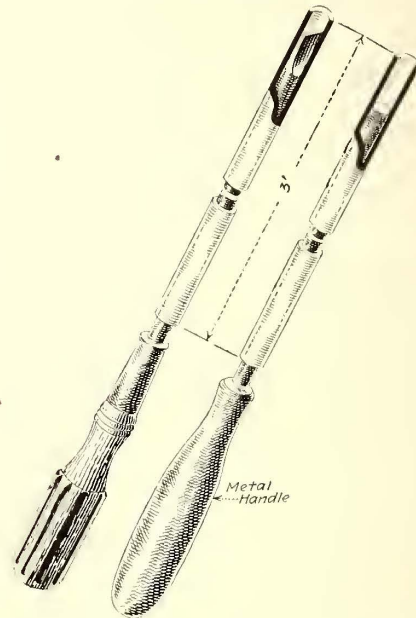
Screwdriver and Hammer for Use in Out-of-the-Way Places

Handy Tool Which Can Be Made of Material Available in Any Shop

BY F. L. HINMAN

Master Mechanic New York State Railways, Syracuse, N. Y.

We have been using in our shops a simple but handy tool devised by D. H. Purdy of the electrical department of this company which has proved very satisfactory in driving nails and screws at points difficult to reach



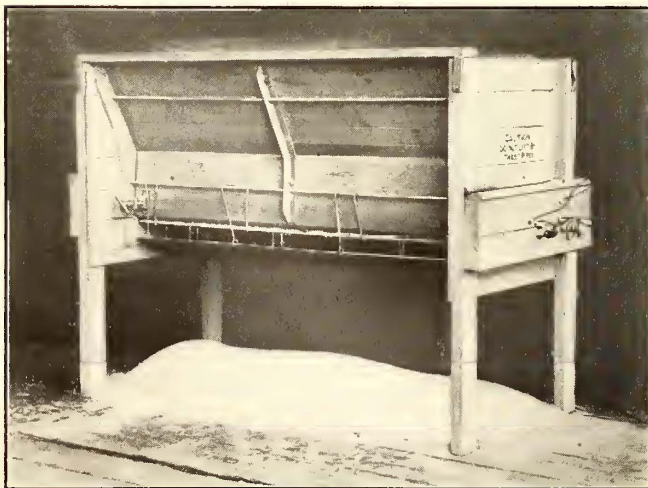
SCREWDRIVER AND HAMMER FOR USE IN OUT-OF-WAY PLACES

with the ordinary tools. It consists of a piece of 1/4-in. gas pipe about 3 ft. long forming a barrel in which slides either the shank of an extra long 5/16-in. screwdriver, or a flat ended rod provided with a metal handle at one end.

In using this tool the screw or nail is dropped head down into the barrel, by which it is guided while being driven home with the driver or hammer respectively.

The tool has been found particularly useful in overhead work, such as putting up electric cable, etc., but there are many jobs on which it can eliminate the battering of fingers and tiring of back muscles.

The Railroad War Board states that the anthracite roads hauled during the first eight months of 1917 7,668,382 tons more anthracite coal than during the corresponding period for 1916. This is an increase of 17.18 per cent. During August, the tonnage hauled was 1,583,609 more than in August, 1916, or 28.35 per cent. The July increase was 24.38 per cent and the June increase 25.24 per cent. These figures show that any reports to the effect that there has been a severe curtailment in the production and distribution of anthracite coal are based upon rumor rather than fact.



ELECTRICAL SAND DRYER USED IN VANCOUVER, B. C.

Cost Data on Special Work Renewals—VIII

By M. BERNARD

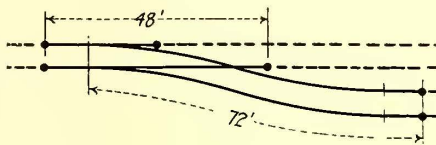
Assistant Engineer Way & Structures Department,
Brooklyn (N. Y.) Rapid Transit System

This is the eighth plate of the series of Cost Data on Special Work Renewals. The previous plates were published in the issues for July 21, Aug. 18, Sept. 8, Sept. 29, Oct. 27, Nov. 10, and Nov. 24

Fig. 28—Side Turnout

Length—120 ft. single track

Construction removed—9-in. girder rail*—8-in. granite on sand.
New construction—9-in. girder rail*—8-in. granite on concrete.

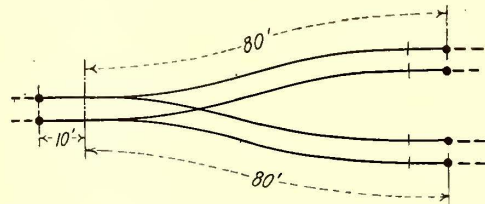


	Light Traffic	Average Traffic	Heavy Traffic
Labor	\$190.00	\$230.00	\$280.00
Handling	80.00	85.00	90.00
Miscellaneous	30.00	35.00	45.00
Total (except materials) .	\$300.00	\$350.00	\$415.00
Cost per single track foot.	2.50	2.91	3.46

Fig. 29—Equilateral Turnout

Length—170 ft. single track

Construction removed—9-in. girder rail*—8-in. granite on sand.
New construction—9-in. girder rail*—8-in. granite on concrete.

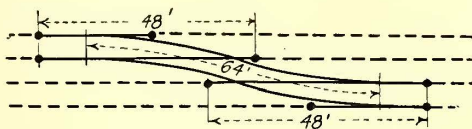


	Light Traffic	Average Traffic	Heavy Traffic
Labor	\$290.00	\$350.00	\$420.00
Handling	95.00	100.00	110.00
Miscellaneous	45.00	50.00	60.00
Total (except materials) .	\$430.00	\$500.00	\$590.00
Cost per single track foot..	2.53	2.94	3.47

Fig. 30—Right Hand Cross-over

Length—160 ft. single track

Construction removed—9-in. girder rail*—8-in. granite on sand.
New construction—9-in. girder rail*—8-in. granite on concrete.

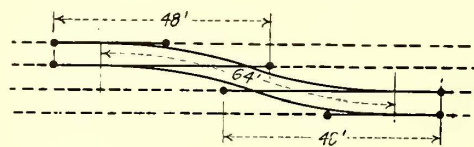


	Light Traffic	Average Traffic	Heavy Traffic
Labor	\$270.00	\$330.00	\$400.00
Handling	90.00	95.00	105.00
Miscellaneous	40.00	45.00	55.00
Total (except materials) .	\$400.00	\$470.00	\$560.00
Cost per single track foot..	2.50	2.94	3.50

Fig. 31—Right Hand Cross-over

Length—160 ft. single track.

Construction removed—9-in. girder rail*—8-in. granite on sand.
New construction—7-in. girder rail*—5-in. granite on concrete.



	Light Traffic	Average Traffic	Heavy Traffic
Labor	\$315.00	\$365.00	\$425.00
Handling	110.00	120.00	130.00
Miscellaneous	50.00	55.00	65.00
Total (except materials) .	\$475.00	\$540.00	\$620.00
Cost per single track foot..	2.97	3.31	3.87

*Hard-center construction. *Explanation:* By "light traffic" is meant either the divergence of cars during progress of work or a traffic of not more than 150 cars per day of twenty-four hours. "Average traffic" denotes the passage of about 325 cars per day of twenty-four hours, and "heavy traffic" that of 750 or more.

By "labor" is meant the labor cost of tearing out the old paving and special work and installing the new at the location where the work is done. "Handling" signifies the cost of loading the necessary materials at the various storage yards as well as the unloading of same at the place of renewal. It also includes the cost of transportation and the cost of removal of old or left-over material. Since the transportation

is done by a subsidiary company, which adds profit and overhead expense to the net cost, this item may differ considerably from that obtained on other railways. Under "miscellaneous" are included the expense of city inspectors, expense incurred when portable crossovers are used for divergence of cars during renewal, watchmen's wages, and incidental engineering expense. The total of these three items—labor, handling and miscellaneous—therefore includes everything except the cost of materials.

On account of the unsettled labor conditions prevailing since the beginning of the war, the costs given are based on pre-war wages, the average track labor on which these costs are based is 20 cents per hour, including the foreman's wages.

Individual Passenger Travel Record Assists Tax Collection

The form of record produced by the Bonham traffic recorder which records the stations at which each passenger boards and leaves a car, the miles traveled and cash fare paid, has taken on a new advantage since the passage of the new revenue law. The record which this device prints and which is turned in by each conductor at the end of his run not only provides all the information necessary in checking the tax collections which must be made at the time of collecting cash fares but provides it in a form which could be very easily checked by the government officials. The war tax on tickets

WAR TAX RECORD, CASH FARES, NOV. 6 1917

TRAIN	CONDUCTOR	3	4	5	6	7	8	TOTAL
		.36-.43	.44-.56	.57-.68	.69-.81	.82-.93	.94-1.06	
C3	H. E. Jones	15	11	08	11	12		.43
C3	"	11	09	11	12	11	14	.69
C3	"	18	11	09	11	15	13	.89
C8	"	11	06	11	12	11	12	.57
73	"	1	09	11	09	11	05	.54
73	"	11	09	11	12	1	14	.58
21	L. T. Ross	11	12	11	02	11	10	.57
26	"	11	06	11	12	1	14	.55
31	"	15	11	08	11	19	11	.52
36	"	11	09	11	12	1		.44
41	"	11	11	12	11	02	11	.60
TOTAL								6.30

FORM USED IN TAKING TAX DATA FROM TRIP RECORD, T. H., I. AND E.

purchased at local offices is of course taken care of by the agent, but the manner of collecting this tax payable on cash fares has caused some concern on various interurban properties.

The Terre Haute, Indianapolis & Eastern Traction Company has found that the tax due the government can easily be totalized from the trip record of each conductor, as printed by the Bonham recorder, with the help of the printed form reproduced herewith. A clerk in the auditing department enters the train number and name of conductor as these appear on the recorder records. He then goes down the list of cash fares paid and places a mark in the proper column on the form for each fare over 35 cents. He then simply multiplies the number of these marks in each column by the tax amounts due on each ticket as shown at the top of the column and puts down the total. These amounts for the different rates of tax are then carried across and totaled at the right. The average trip report can be checked in a minute and a half.

In a similar manner, the clerk goes through the turn-in record for each run made by that conductor for the day, finally totaling the tax amounts due from that conductor for his day's business. This figure, added to the total cash collected by him for fares, should tally with his total cash turn-in.

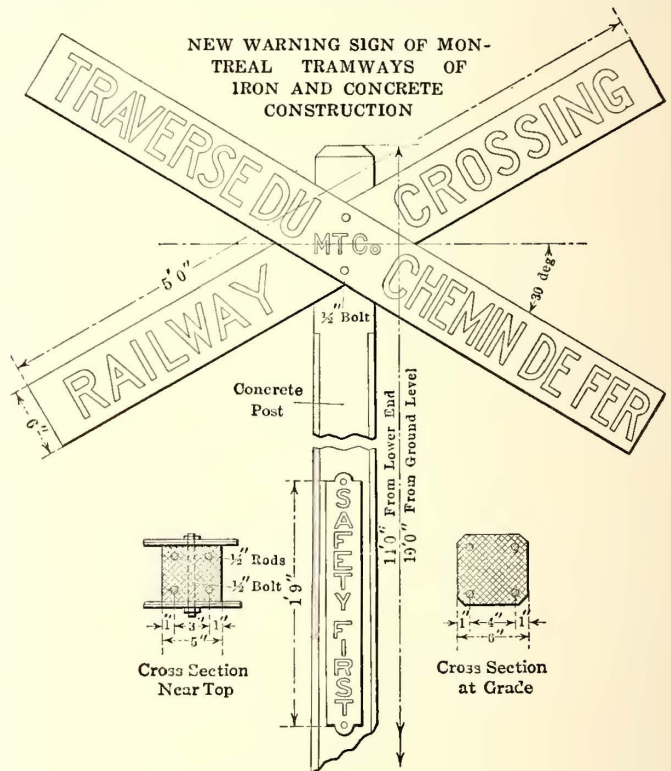
These records from the recorders and the summary sheets on which the cash returns are figured, are inclosed in an envelope and filed by days and by conductors. In this form it is a very simple matter to go back at any time and recheck the figures on any run or for any conductor. In case the government officials investigate the turn-ins of the electric railways, it would

therefore seem that this system of recording the passenger traffic data and summarizing it would be of great assistance to the company in substantiating any questioned returns.

A reproduction of a typical Bonham record was published on page 272 of the Aug. 18, 1917, ELECTRIC RAILWAY JOURNAL.

A Substantial Highway Crossing Warning Sign

With a view to obtaining a warning sign which should be permanent, require little attention for maintenance and present an attractive appearance, the Montreal Tramways has adopted the construction shown in the accompanying drawing. The signboards or blades are of cast iron, enameled, the letters being in white on a black background. The blades are 5 ft. long, 6 in. wide with letters 4 in. high. The blades are set at an angle of 30 deg. from the horizontal. The wording of



the warning is in French as well as in English, because a large proportion of the local population is more familiar with the former language than the latter.

The posts are of reinforced concrete, one part cement, two parts sand and four parts 1/2-in. broken stone. The concrete is waterproofed with hydrated lime mixed dry with the cement, and the posts are painted with water-glass. They are finished with bands of white and black alternately, painted at an inclination of 45 deg. and 4 in. wide measured perpendicularly to the direction of the bands. Attached to the post at eye level is a cast-iron safety-first plate lettered like the blades, but with letters 1 1/2 in. high.

The posts are 14 ft. in length, 4 ft. being buried in the ground. They are reinforced with 1/2-in. rods, and the blades and safety-first plates are bolted through the posts. The cost figures are not yet available, but the design was not made with the lowest possible first cost in mind but rather with a view to ultimate economy.

News of Electric Railways

Traffic and Transportation

Financial and Corporate

Personal Mention

Construction News

Action on St. Louis Grant Postponed Public Utilities Committee of Aldermen Puts Over Consideration of United Railways Settlement Grant

The public utilities committee of the Board of Aldermen of St. Louis, Mo., on Nov. 26 decided to postpone consideration of the proposed settlement ordinance for the United Railways for a week. The committee declared that a delay might result in new and valuable information being brought out by the opponents of the settlement. If valid objections, based on facts, were offered the committee declared its willingness to draft a substitute bill embodying such suggestions. In discussing the \$60,000,000 valuation clauses of the proposed bill, the committee indicated that material changes might be made with respect to the conditions which have been proposed to govern the appraisal.

AMENDMENTS PROPOSED

C. E. Smith, consulting engineer of the public utilities department, told the committee on Nov. 26 that if the \$60,000,000 value was not acceptable as the purchase price by which the city could buy the property, a clause could be drafted providing that, if the city desired to buy it at the end of any five-year period during the life of the franchise, a valuation of the property might be made at that time in a manner specified in the ordinance.

It is stated that Mayor Kiel and City Counselor Daues have decided to offer radical amendments to the settlement bill. Instead of a board of control on which the company will name one member and the city one an amendment prepared by Mr. Daues will substitute the Public Service Board as the body that shall order extensions of lines and improvements of service. In addition to this the amended bill will set forth in detail the minimum amount of increased service to be furnished in the future. Another amendment to be drafted by Counselor Daues will require the immediate payment of the accrued mill tax amounting to more than \$2,000,000, with a proviso that if it is paid in installments within five years the company shall pay 6 per cent interest on deferred payments. The present bill gives the company ten years in which to pay the accrued mill tax and provides that no interest shall be charged during the first five years on deferred payments.

Counselor Daues said that the amendments he was drafting were suggested in conference with an alderman on the utilities committee. Mayor Kiel frequently expressed the hope that any franchise settlement bill would be subjected to a public vote under the referendum provision of the new city charter, so that nothing might be enacted that did not meet with the approval of the taxpayers and voters of the city.

Dallas Improvements Approved

The improvements outlined by R. Meriwether, general manager, to be carried out by the Dallas (Tex.) Railway under the new service-at-cost franchise were approved by the City Commission at a special session on Nov. 28. It is proposed eventually to carry out work under the program to a total of \$1,000,000. For the immediate future the expenditure of \$400,000 is contemplated. Three new lines will be established and two that are now in operation will be discontinued. The plans for the program of betterments were reviewed at some length in the *ELECTRIC RAILWAY JOURNAL* of Nov. 17, page 914.

Immediately following the approval of the plan as submitted, the company notified the Lorain Steel Company, from which it had contracted for the purchase of 1400 tons of rail

with special work, to proceed with delivery. This steel was contracted for at \$57.60 a ton, all for delivery within three months. Mr. Meriwether explained that the steel company had stated that it was necessary to make immediate delivery of the entire order or delay the shipment for some time. Mr. Meriwether in a communication to the City Commission outlined the improvements that will be made at once.

Short Strike on Maine Road

Precipitate Action of Men Repudiated by Union's International Officer

The Lewiston, Augusta & Waterville Street Railway, Portland, Me., which has been using the Rooke register for cash fare collections on the local lines for about eight months, posted a notice on Sunday afternoon, Dec. 2, requiring the use of this register on certain interurban lines where hand collection of the 5-cent fares in each zone had heretofore been the practice.

Certain men on the Lewiston division resented the extension of the use of the register to the lines upon which they worked, and without even the formality of a vote of the union local, induced the men on that division not to operate cars on Dec. 3.

VICE-PRESIDENT FORD ADDRESSES MEN

On the evening of Dec. 4 the strikers held a meeting, at which A. H. Ford, vice-president and general manager, addressed the men. He made it plain that the men had violated their written contract, had caused a serious loss to the merchants and working people of the community, to say nothing of the loss to the company, and that their action was generally condemned. Mr. Ford appealed to the men to resume work, stating that if they did so at once they would be taken back without prejudice and that any matters in dispute between them and the company could then be handled as provided for in the contract.

After going into executive session the union replied that the men would return to work on the condition that the Rooke register be eliminated from the entire system, including the local lines where it had been in use for a long time; that the company immediately discharge nine loyal men whose only offense was that they were delinquent in their union dues; that no record be made against any of the strikers for their actions that day, and that the men receive a full day's pay for the time they were out on strike.

Mr. Ford said that he could not agree to these conditions.

On the morning of Dec. 4 the men on the Augusta division, who were affiliated with another local of the Amalgamated Association, struck in sympathy with the Lewiston men, without the formality of a strike vote or the sanction of the national body and contrary to their contract with the company. In the meantime service in and around Lewiston was maintained at about 25 per cent normal.

INTERNATIONAL OFFICER DISCLAIMS RESPONSIBILITY

On the afternoon of Dec. 4, P. J. O'Brien, international vice-president of the Amalgamated Association, arrived in Lewiston and asked for a conference with the company officials. At that conference he disclaimed for the Amalgamated Association all responsibility for the strike, saying that it was not authorized or supported by the association. He confirmed the company's stand in maintaining that the matter of fare collection was wholly one of management and that it was the duty of the men to proceed to the best of their ability along the lines mapped out by the company. He asked that the men be permitted to return to work on the morning of Dec. 5 without conditions of any sort. His offer was accepted and full operation was resumed on that date.

Seattle Extension to Proceed

Municipal Railway to Be Continued from Thirteenth Avenue West to Market Street and Leary Avenue

Upon a showing made by Hugh M. Caldwell, corporation counsel of the city of Seattle, Wash., that at least \$53,000 had been subscribed for a railway utility bond issue of \$40,000 to provide for the extension of Division A of the Seattle Municipal Railway into Ballard, Judge Calvin S. Hall recently denied the petition of T. N. Haller, a taxpayer, for an order enjoining the city from transferring \$35,000 from the general fund to the street railway fund, as a loan. The denial of the injunction is an official recognition of the solvency of the street railway fund, and allows the completion of the railway from Thirteenth Avenue West to the intersection of Market Street and Leary Avenue. This work was begun some weeks ago by funds of the streets and sewers department.

Following the over-subscription of the railway bond issue, the city utilities committee, anticipating revenues sufficient to meet interest and provide for the early retirement of the bonds, has introduced a bill in the City Council whereby the line, instead of terminating at Market and Leary Streets as heretofore planned, will be built at once to West Sixty-seventh Street and Twenty-third Avenue Northwest, to intersect with the Loyal Heights line, to which it is proposed to transfer. The amount of the issue will be changed from \$40,000 to \$125,000.

An exchange of transfers is already in effect with the Seattle & Rainier Valley Railway, so that when the Ballard extension is completed patrons of the city railway will be able to ride for 5 cents from the southeastern corner of the city to the city limits in the northwest.

The Board of Public Works has rejected the offer of Harry Whitney Treat to sell the Loyal Heights Railway in Ballard to the city for \$70,000, payable in utility bonds. The board has also rejected the offer of Meacham & Babcock to build the new line for \$117,000.

War Delays New York Lines

Lexington and Seventh Avenue Rapid Transit Lines to Open in March

The operation of trains in the Lexington Avenue and Seventh Avenue subways in New York will not begin before March 1 at the earliest. Announcement to this effect was made on Dec. 4 by Oscar S. Straus, chairman of the Public Service Commission, in a letter replying to a suggestion from President Dowling of the Board of Aldermen that partial operation of trains in these subways be begun at once to relieve congestion on existing lines.

Mr. Straus said the delays were due to "war conditions," and that they came in spite of every effort made by the commission to hurry the work. In his letter he said the track work on the Seventh Avenue line through William and Wall Streets to the Battery was finished, that materials for the stations on both lines were being brought from Pittsburgh by motor truck, and that an extension of the service on the Seventh Avenue line, now operating from Times Square to the Pennsylvania station, may be expected south to the Battery "possibly by January."

The necessity for all of the signal and control devices that make for safety on the new lines is dwelt upon by Mr. Straus, who said that the difficulty of installing these systems was one reason for delay.

Mr. Straus said that the Brooklyn Rapid Transit Company would probably be operating trains on the Broadway line as far north as Times Square and as far south as Whitehall Street in the near future. This line is now running north to Fourteenth Street from Canal Street.

At a hearing on Dec. 6 Frank Hedley, vice-president and general manager Interborough Rapid Transit Company, said that the government had taken some cables made for the company and the situation was uncertain; that government needs had required the reletting of a wheel contract at a 60 per cent advance in cost, and that the company could not get enough skilled men because of government work.

More Money for Buffalo Appraisal

The City Council of Buffalo, N. Y., has granted the request of the city law department for an additional \$20,000 for the appraisal of the physical property of the International Railway. This information is being obtained by the municipal authorities to defend the proceedings brought by the railway for a review of its special franchise assessment in Buffalo for the year 1916 and will be available for the application before the Public Service Commission of the Second District to obtain a reduction in fare in the 5-cent zone of Buffalo. Of the \$60,000 authorized by the Council more than \$40,000 has already been expended.

J. C. Brackenridge, New York, N. Y., formerly with the Brooklyn (N. Y.) Rapid Transit Company, is investigating the physical properties of the company. His report indicates that the appraisal has been practically completed. The work has progressed to this extent: track, 90 per cent; paving, 90 per cent; electrical distribution system, 85 per cent; rolling stock, 25 per cent; power plant and equipment, 90 per cent; furniture and fixtures, 100 per cent; buildings, 30 per cent; tools, stores, real estate, none.

Freight Terminal for Akron

The Northern Ohio Traction & Light Company, Akron, Ohio, is concluding negotiations for a 3-acre strip of ground in Akron, adjacent to another 3-acre strip which it already owns, to be used ultimately for a freight terminal. No work is contemplated at present on account of the very high costs of material and labor, but as soon as is possible this ground will be utilized so that the freight facilities of the company may be expanded to meet the demand. The plan calls for the erection of four buildings and trackage. The movement of cars through the yard will in general be into a single track along one side, and looping back over any of the three tracks between either of the two pairs of buildings. These buildings will be constructed one or two at a time as the growth of the business requires.

A building for the use of the line department as a store-room and garage will also be constructed eventually on a piece of ground adjacent to the freight yard. A side track off the main entrance track to the yard and a steam road connection close by, will afford facilities for receiving supplies in carload lots directly at the storeroom.

Fire Destroys Carhouse and Office

Small Colorado Property Loses Nearly All Its Effects—Desires Equipment Catalogs

A fire which started at 11.20 a.m. on Nov. 23 from an unknown cause completely destroyed the carhouse, substation, office, etc., of the Greeley & Denver Railroad, Greeley, Col. The carhouse was a building 60 ft. x 100 ft. In addition to providing storage for six cars it contained the superintendent's office, rotary converter and other substation machinery, and the storeroom and blacksmith shop. There were three cars in the carhouse when the fire occurred. None of them was saved. The substation equipment, together with all other materials, was also a total loss. The building and its equipment were partially covered by insurance. The Western Power Company came to the assistance of the railway promptly. That company loaned the railway a motor and a 550-volt generator and furnished men to set up the equipment. This made it possible for the railway to restore service at 1.25 p.m. on Nov. 24. F. Norcross, manager of the Home Gas & Electric Company, Greeley, also rendered assistance by furnishing men and material to the company. The machinery which the railway obtained for use in the emergency was in service in Boulder at the time of the fire. It was taken down, loaded on motor trucks and brought to Greeley, 70 miles, where it was promptly set up, foundations having been prepared for the apparatus while it was on the way. The address lists, catalogs and all other office records of the company were burned. The railway would like to receive catalogs, etc., from firms with which it has been doing business and have the line on their mailing lists.

Hearing on Brooklyn Car Purchase Order

The Public Service Commission for the First District of New York began on Nov. 30 a rehearing on the application of the Brooklyn Rapid Transit Company in behalf of its subsidiary street surface railways on the order of the commission, issued last winter, requiring the companies to purchase 250 new cars for the supplying of decent service on Brooklyn lines. The company, at the present time, is prosecuting appeals from the commission's order in the Supreme Court of the United States and in the courts of New York State, but at the same time announced at the rehearing that it had made all efforts to procure the cars in the event that decisions in the courts were adverse to it. As a reason for requesting a rehearing, the company stated that it did not desire at this time to purchase the cars and requested the commission to refrain from enforcing its order until such time as prices, now declared by it to be nearly 100 per cent in excess of normal for materials and labor, are restored to normal. Counsel for the commission at the first session of the rehearing stated that conditions on the company's lines were just as serious from a standpoint of congestion and overcrowding as when the order was issued a year ago. The commission announced that it would continue the taking of testimony on Dec. 7.

Twin City Union Men Out

Repudiate the Conditions of Arbitration Agreement and Are Replaced by Others

A serious situation has developed in the Twin Cities over the matter of the use of union buttons by the men employed by the Twin City Rapid Transit Company when operating their cars. As noted in the *ELECTRIC RAILWAY JOURNAL* for Dec. 1, page 1006, the present difficulty grew directly out of the recent strike of the men in Minneapolis and St. Paul. The arbitration board which settled the original differences between the men and the company recommended that the insignia of organization be dropped. Both sides had agreed to abide by the recommendations of the board and the committee had reason to feel that the principal difficulty had been settled by compromise. The company posted notices in accordance with the order of the commission. The non-union, or so-called protective association, men removed their buttons, but the union men refused to do so. They were therefore not permitted to take out the cars because they had not done as their representatives had agreed with the committee that they would do.

ATTEMPT TO INDUCE SYMPATHETIC STRIKE

The union car men sought at once to enlist the sympathy of other organized labor. As a result of their efforts more than 12,000 labor union men met in convention in St. Paul on Dec. 5 to consider the matter, but voted an armistice until Dec. 11, thus deferring action on the general strike, pending possible settlement of the question by State officials or federal intervention. In this action conservative opinion triumphed. The steam road unions opposed the sympathetic strike as against their agreement with their employers. Many industries were severely hampered when the union men stopped work to attend the convention.

On the same day the Governor removed C. W. Ames from the Minnesota Public Service Commission, to which the committee that settled the strike had reported. He then appointed H. W. Libby, Winona, to the commission. It is understood that Mr. Libby favors upholding the commission in respect to its order requiring the removal of the button.

SERIOUS DISORDER IN ST. PAUL

The most serious disorder so far reported occurred on Dec. 2 when more than 2000 persons engaged in rioting, following a mass meeting in Rice Park, St. Paul. The crowd cut trolley ropes, removed fenders and stoned the cars. About forty non-union men were reported injured. Twelve arrests were made after about 1400 members of the home guard had been mobilized in the absence of city and county protection. As a result of this demonstration service was

suspended until morning, and the interurban cars from Minneapolis were turned back at the St. Paul city limits. The company promised to maintain service if protection was afforded. The saloons in both cities were closed on Dec. 6. Eleven home guard companies were mobilized at the Capitol. E. S. Davidson, recently appointed sheriff by the Governor, ordered his deputies to shoot to kill.

The Governor has so far refused federal aid toward settling the difficulty. On Dec. 6 service was reported 99.2 per cent normal in Minneapolis and 93 per cent normal in St. Paul as against 95.8 per cent and 78.9 per cent on Dec. 5. A hearing on the mandamus suit brought by the city to enforce adequate service on the lines of the company was postponed from Dec. 5 until Dec. 7.

Hearing on Strike Arrests

The preliminary hearing of charges against Joseph W. Horton, Harry E. Tattman and James R. Taylor, former trainmen for the Springfield (Ill.) Consolidated Railway, charged with violations of the new federal act with reference to explosives, was set for Dec. 1 before United States Commissioner Harvey T. Culp. The men are at liberty under \$3,000 bonds. The men were arrested by United States deputy marshals on warrants issued by the district attorney's office.

In a statement issued by A. D. Mackie, general manager of the company, following the arrests, he said:

"We anticipate that subsequent developments will show that the responsibility for the many outrages during the strike does not rest with coal miners, but with a small clique of former electric railway men aided and abetted by a few jitney owners whose profits have been dependent upon a continuance of turbulent conditions, and a few of the more radical socialists among the coal miners and union sympathizers."

Wage Increase Rejected

The Cleveland (Ohio) Railway has offered its trainmen a 5-cent an hour increase in wage, bringing the maximum up to 40 cents an hour. The present scale, which was settled on in 1916, is 32 cents for the first year of service and 35 cents the second and succeeding years. The new scale will raise these figures to 37 and 40 cents, respectively.

The contract which the company now holds with its men does not expire until May 1, 1918. The company has offered this increase with a stipulation that a new contract will be made extending to May 1, 1919, but with the new scale dating from Nov. 1, 1917. This would give the men 5 cents an hour additional wage during the remaining six months of the present contract, if accepted. The men rejected the offer nearly two to one by a vote taken on Dec. 5.

Pittsburgh Transit Report in January

Edwin K. Morse, appointed transit commissioner of Pittsburgh, Pa., in November, 1916, stated before the finance committee of the City Council on Dec. 4 that he had his report on the local transportation situation nearly completed and that it would undoubtedly be ready for distribution about Jan. 15. He is reported to have said:

"I can say in advance that I will report in favor of municipal ownership of rapid transit lines. Whether you want it is for you to say. Rapid transit in co-operation with the Pittsburgh Railways can be put on a paying basis. Whether there will be such co-operation I cannot say.

"The time has come when this question must be met. Nothing would do more for the progress of the city and tend to stop industries passing us by for Western cities than the solution of this problem. If you wish me to make up a budget so that you can have an idea of what will be needed, I will do so. It will be necessary to have a transit bureau, the same as you have other bureaus to look after other municipal activities. I have dealt with every phase of the transit question in language as clear as I know how to use and in a manner as conclusive as I am capable of using. I do not think there will be any doubt as to what are my opinions."

Increase in Wages in Milford.—The Milford & Uxbridge Street Railway, Milford, Mass., has announced an increase of 2 cents an hour in the wages of its motormen and conductors, bringing the maximum pay of its men to 34 cents an hour.

Buses Replace Short Railway.—The Railroad Commission of California granted permission on Nov. 23 to the Burlingame (Cal.) Railway, operating 2 miles of line, to discontinue the operation of its storage-battery car and to substitute a service of two buses.

City Plan Expert to Pass on Dallas Improvements.—The city of Dallas, Tex., has voted to employ George E. Kessler, the city plan expert of St. Louis, Mo., to work with N. M. Baker, supervisor of public utilities, in laying out extensions and improvements of the local railway system in Dallas.

Bus Hearing Goes Over.—The hearing before the Board of Estimate of New York set for Nov. 27 to consider the authorizing of advertising for a public hearing on the bid of the Fifth Avenue Coach Company for rights to operate buses on streets other than those now occupied by it was put over until Dec. 26.

Police Dismissals Growing Out of Strike Sustained.—The civil service board of Seattle, Wash., has sustained the action of the police department making permanent the discharge of E. W. Benjamin and the twelve other police officers dismissed from the department last July for insubordination during the electric railway strike.

Accident at Toledo Plant.—A short-circuit of the oil switches, combined with other unknown factors, damaged the Water Street plant of the Toledo Railways & Light Company, Toledo, Ohio, on the evening of Nov. 27. The city cars were at a standstill for more than an hour, and no cars moved on the Toledo & Western road until 1 o'clock the following morning.

Street Railway Department for Cincinnati.—City Solicitor Groom of Cincinnati, Ohio, has prepared an ordinance for introduction in the City Council creating the department of street railways, as provided by the new city charter. A director of street railroads is to be appointed and it is said that C. W. Culkins, street railway commissioner, will be appointed to the position. The director will be responsible only to the Mayor and the Rapid Transit Commission.

Seattle H. C. L. Figures.—The department of economics of the University of Washington at Seattle will shortly publish a complete study of the cost of living made by the arbitration board working on the strikes of the electric railway employees in Seattle and Tacoma, whose findings were made public recently. The survey will classify the facts and conditions which led to the award of the arbitration board, according to Carleton H. Parker, director of the school of business administration of the university.

Tax Values Raised in Illinois.—In need of additional funds, the State Board of Equalization of Illinois increased the assessed value of land, personal property, and corporations 3 per cent. On this a tax rate of 80 cents for corporations will probably be fixed. In Chicago alone this means an aggregate increase in assessed value for the electric railways of \$6,213,113 more than last year, the total assessed value being \$64,496,586. This was made on a 70 per cent basis, so that the full value would be \$93,000,000.

Must Report Daily to Benefit by Wage Increase.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., has issued an order that conductors and motormen must report for work daily if they want to benefit by the 2-cents-an-hour raise granted recently. The men will have to have a clear record if they want to earn the raise. Thirty-two men recently failed to report for work in two days and the company was greatly handicapped in maintaining its regular schedule.

Investigation Committees Appointed in Portland.—Committees have been appointed by the various civic clubs of the city to gather information relative to the requirements of the Portland Railway, Light & Power Company, Portland, Ore., so that the company can continue to abide by the decision of the arbitration committee as to hours and wages of the company's employees. Committees will in-

terview the company, the employees, the Public Service Commission and the Board of Arbitration. C. L. Rauch is chairman of the general committee.

Officials at Trenton Plead Not Guilty.—Rankin Johnson, president of the Trenton & Mercer County Traction Corporation, Trenton, N. J., and other officers of the company on Dec. 4 entered pleas of not guilty before Judge Marshall in the Mercer court to indictments charging them with illegal maintenance of wires and poles on fifteen streets of the city. Counsel for the defendants will apply to the Supreme Court for writs of certiorari through which efforts will be made to have the indictments quashed. The court permitted the officials to enter bail to the amount of \$500 in their own recognition.

Wage Increase in Scranton.—The union has made public through the daily press the offer made by the Scranton (Pa.) Railway to its employees and accepted by the men, whereby all trainmen, shopmen, carhousemen and trackmen will receive an increase of 3 cents an hour. Should the company secure additional relief by a change of fare from 5 to 6 cents the company will make a further increase of 1 cent an hour two months after the 6-cent fare becomes effective. The men have appealed to the public to withdraw all opposition to the increase in fares in order that the employees may benefit by the raise.

Personnel of Dallas Lines.—Richard Meriwether, general manager of the Dallas (Tex.) Railway, has announced the following appointments of operating officials of the lines: George R. Plummer, superintendent of transportation of all lines both east and west of the Trinity River, succeeding B. W. Gerhardt, who will remain with the Stone & Webster organization; C. A. Swanson, division superintendent of the lines east of the Trinity River, and J. T. Morton, division superintendent of the lines west of the Trinity. The lines west of the Trinity in Oak Cliff are owned by Stone & Webster, but are leased to the Dallas Railway.

Hope to Save Road.—A permanent organization has been formed to buy the New York & Pennsylvania Railroad, Hornell, N. Y. The Shinglehouse Board of Trade and the Canistota Chamber of Commerce are interested in the purchase of the line, which was about to be abandoned. W. G. Hartman, Shinglehouse, N. Y., is chairman of the organization committee, and Guy M. Beasor, secretary of the Canistota Chamber of Commerce and manager of the property, is secretary. It is planned to finance the road with an issue of not more than \$150,000 of stock and a bond issue of between \$250,000 and \$300,000. A proposal to electrify the road is said to be under consideration.

Ordinances Drag in Chicago.—Walter L. Fisher, special counsel for the committee on local transportation of the Chicago City Council, as noted in the ELECTRIC RAILWAY JOURNAL for Nov. 10, page 874, was directed to draw up two traction ordinances. One of these was to embody the recommendations contained in the Traction and Subway Commission report, and the other these recommendations only in so far as they could be carried out without enabling legislation. Several weeks have elapsed since then, and on Nov. 28 Mr. Fisher told the committee he believed it would be a waste of time and money to carry out its instructions. Some of the committee members rebuked Mr. Fisher for the delay and despite his frank warning they voted 10 to 6 to renew their instructions to him.

Increase in Wages in Lexington.—Announcement of a 6-cent fare on all the Lexington city lines of the Kentucky Traction & Terminal Company is followed by a statement that the company will advance the wages of the motormen and conductors on both the city and country lines 1½ cents an hour. At the same time S. H. Dailey, general manager of the Kentucky Traction & Terminal Company, announced that the men would receive a further raise on July 1, 1918. Some time ago the company put into effect a co-operative plan by which it set aside 18½ per cent of its gross earnings, out of which the claim department charges were to be met and motormen and conductors' salaries paid. Out of this fund an increase of 1½ cents an hour was granted. The reduction in net earnings due to rising costs and the prospect of increased taxes made the increase in fares imperative.

Financial and Corporate

Annual Report

Boston Elevated Railway

The income statement of the Boston (Mass.) Elevated Railway for the six months ended Dec. 31, 1916, follows:

Revenue from transportation	\$9,506,557
Revenue from other railway operations.....	291,322
Railway operating revenues.....	\$9,797,879
Railway operating expenses:	
Maintenance of way and structures.....	\$997,276
Maintenance of equipment.....	742,862
Power	684,892
Conducting transportation	3,230,221
Traffic.....	12,479
General and miscellaneous.....	962,995
Total operating expenses.....	\$6,630,725
Net revenue—railway operations.....	\$3,167,154
Taxes assignable to railway operations.....	534,575
Operating income	\$2,632,579
Non-operating income.....	43,763
Gross income	\$2,676,342
Deductions from gross income:	
*Rent for leased roads.....	\$1,296,822
†Miscellaneous rents	402,797
Interest on funded debt.....	531,719
Interest on unfunded debt.....	33,094
Amortization of discount on funded debt.....	2,230
Miscellaneous debits	2,419
Total deductions	\$2,269,081
Net income	\$407,261
Dividend No. 37, paid Aug. 15, 1916, 1½ per cent.....	\$358,191
Dividend No. 38, paid Nov. 15, 1916, 1½ per cent.....	358,191
Deficit.....	\$309,121

*Includes rent of Tremont Street subway. †Rents of all other subways and tunnels.

By a recent act of the Legislature the ending of the fiscal year of electric railways was changed from June 30 to Dec. 31, thereby necessitating a change in the date of annual reports of the Boston Elevated Railway. Its present report, therefore, covers only the last six months of 1916.

The volume of business for these six months is shown by the fact that the revenue passengers carried totaled 189,415,158. This number was an increase over the business of the previous year (six months) of 10,100,867, or about 5.63 per cent.

The deficit of \$309,121 for the six months' period ended Dec. 31, 1916, was occasioned by the fact that the company during that period, in accordance with its established custom, paid dividends at the full rate of 6 per cent per annum with the intention of paying only such lesser amount of dividends during the balance of the fiscal year as the earnings for the full year might justify. Amounts of 1.5 per cent and one-half of 1 per cent were declared in February and May, 1917, so that the total for the year ended June 30, 1917, was 5 per cent. The recent passing of the October quarterly dividend payment was noted in the *ELECTRIC RAILWAY JOURNAL* of Nov. 3, the August declaration having been 1.5 per cent.

The revenue car-miles in the last six months of 1916 totaled 29,835,503, and the revenue car-hours 2,748,691. The total charges against income for taxes, rent of leased roads, rent of subways and tunnels, interest on funded debt, interest on unfunded debt and miscellaneous items for the six months amounted to \$2,803,656, an increase of \$59,330 over the corresponding part of the previous year.

In regard to the pending Legislative investigation into the company's financial needs, the report says:

"Based on the incontrovertible facts presented at or developed by the proceedings before these various commissions we feel that we are justified in expecting substantial relief from the next Legislature, and the directors and officers intend to continue their untiring efforts to secure for the company the restoration of that financial condition which common justice and public interest demand."

Abandonment Proceedings in Ohio, Kentucky and Arizona

The Public Utilities Commission of Ohio issued an order on Nov. 27 granting the application of the Springfield & Xenia Southern Railway, Springfield, for permission to abandon that portion of its track between Roslyn, Montgomery County, and Spring Valley, Green County. The company asserts that this section of the road had been operated at a loss for many years; that the financial standing of the entire system was endangered by it, and that there was no hope of improvement in the future.

One of the points made by the Court of Appeals in rendering a decision against the abandonment of the Cincinnati-Bethel branch of the Interurban Railway & Terminal line, Cincinnati, Ohio, is that the power for such action is with the company itself and that the receivers have no right to abandon a franchise. The Public Utilities Commission some time ago declared it had no authority to hear an application for abandonment of this section of road and the Supreme Court approved its stand, but since that time the Gilmore law has gone into effect and it is said action for abandonment in this case may again be brought before it. Until such a step is taken the company must continue to operate the road. An agreement has been made to sell the track and rolling stock to the Clermont Construction Company and take in payment \$240,000 of first mortgage bonds and \$433,000 of common stock of the Cincinnati, Georgetown & Portsmouth Railroad, which operates a parallel line.

At the instance of the Paducah (Ky.) Traction Company the City Commission is considering an amendment to the franchise under which the company operates so as to permit it to suspend service on the so-called Fisherville line. This line, which terminates on South Ninth Street, parallels three other lines into that portion of the city which could be relied on for service. Last year it cost \$5,763 to operate the Fisherville line. The revenue was \$4,127.

The Phoenix (Ariz.) Railway has announced through the press that it will abandon its Grand Avenue line. Owing to the prohibitive costs of material and lack of funds, the company will abandon the line until conditions return to normal. In its announcement the company states that it cannot keep up with the building of tracks, improving of service, paving of streets and competition of auto buses at the present 5-cent fare.

Another Line Sold for Junk

The Bristol County Street Railway, Taunton, Mass., operated since 1902 between Attleboro and Taunton, with a spur line to Pawtucket, R. I., has been sold to Swift, McNutt & Company, building wreckers of Boston, for \$110,000. This is said to be \$32,000 more than the outstanding debts. It is stated that as soon as the sale is confirmed by the courts the operation of the line will be discontinued.

Barre and Montpelier Traction & Power Company, Barre, Vt.—Efforts are being made to effect a readjustment of the finances of the Barre & Montpelier Traction & Power Company without the need for the appointment of a receiver or the bringing of foreclosure proceedings. As noted in the *ELECTRIC RAILWAY JOURNAL* of Nov. 17, page 921, the company did not pay the \$100,000 of bonds which matured on Nov. 1. A meeting of the bondholders was held recently in Boston, Mass., at which it is said the owners of a large part of the bonds agreed to an extension of the bonds for twenty years and to a plan for deferring or foregoing interest for the present. An effort will now be made to have the remaining bondholders subscribe to this plan.

Buffalo, Lockport & Rochester Railway, Rochester, N. Y.—It is announced that Allen & Peck, Inc., who took over the management of the Buffalo, Lockport & Rochester Railway in October, 1915, having completed their work, have withdrawn from the company as its operators. William O. Morgan, who has been vice-president of the company, has succeeded C. Loomis Allen as president. A. S. Muirhead has been elected vice-president to succeed Mr. Morgan. W. W. Foster, secretary and treasurer, has succeeded M. C. Sauerwein as general manager.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.—The Cleveland, Southwestern & Columbus Railway, recently authorized to issue \$201,836 of bonds, has filed supplemental application for permission to issue \$248,590 in first mortgage bonds to secure funds for improvements. The bonds are to sell at not less than 85.

Columbus Railway, Power & Light Company, Columbus, Ohio.—The Ohio Public Utilities Commission has authorized the Columbus Railway, Power & Light Company to issue \$1,000,000 of bonds and \$276,000 of preferred stock. The proceeds of the sale of bonds will be used to take up an issue of \$1,000,000 of one-year notes, part of which have been sold, and the remainder of the funds will be devoted to defraying the cost of the new Walnut power plant, which is now ready for operation.

Dallas (Tex.) Railway.—The Dallas Railway has filed an amendment to its charter increasing its capital stock from \$100,000 to \$2,600,000, all paid in, and represented by property belonging to the Dallas Consolidated Electric Street Railway, Metropolitan Street Railway, Dallas Equipment Company, Rapid Transit Railway and the Interurban Terminal Association of Dallas. The company has amended its charter so that the board of directors shall consist of fifteen instead of nine members. In pursuance of the change the following have been elected as the six additional directors: S. W. King, R. D. Suddarth, Orville Thorpe, M. B. Shannon, W. S. Mosher and C. E. Calder, all of Dallas. Authority to raise \$2,600,000 has been granted by the City Commission to the Dallas Railway. The company has been authorized to issue 21,000 shares of common stock and 5000 shares of 7 per cent preferred stock. The resolution adopted by the City Commission provided that the money borrowed must be used for labor or for property actually acquired. Representatives of the Strickland-Hobson interests say that 6 per cent notes will be issued, this plan being adopted as more suited to present financial conditions than issues of stocks and bonds.

Detroit (Mich.) United Railway.—The Detroit (Mich.) United Railway has announced that the \$50,000 of first mortgage 5 per cent gold bonds of the Detroit Railway, payable on Dec. 1, will be redeemed if the holders present the bonds with the coupons at the Peoples State Bank, Detroit, Mich.

Interborough Rapid Transit Company, New York, N. Y.—The remarkable feature of the October report of the Interborough Rapid Transit Company, given in the "Table of Electric Railway Monthly Earnings," is that, although passenger revenue for the corresponding month of last year was \$506,508 more than in October, 1915, due to the diversion of traffic from the surface lines during the strike, the passenger revenue for October of this year came within \$43,223 of equalling last year's abnormal record. For the month of October during the eight-year period from 1908 to 1915, inclusive, passenger revenue has shown an average increase of 4.11 per cent. For the two-year period of 1916-1917, this average increase jumped to 8.02 per cent, a gain of nearly 100 per cent. The average increase of 4.11 per cent includes the heavy traffic of the Hudson-Fulton celebration of October, 1909, which gave an increase of 11.59 per cent.

International Railway, Buffalo, N. Y.—The New York Public Service Commission for the Second District has granted the petition of the International Railway for authority to issue \$450,000 of its refunding and improvement mortgage bonds. The bonds may be issued and sold at not less than 85 per cent of their face value and their proceeds may be used to meet the cost of proposed additions to and betterments of the company's system.

Lackawanna & Wyoming Valley Rapid Transit Company, Scranton, Pa.—Brooks & Company, Scranton, Pa., announce that the sinking fund and redemption plan of Aug. 20 between the company and the holders of the 5 per cent fifty-year collateral trust gold bonds of the Lackawanna & Wyoming Valley Rapid Transit Company, has become operative by the deposit with the Guaranty Trust Company, New York, as depository of more than \$855,000 of the \$888,000 of outstanding 5 per cent bonds of the Lackawanna company, and that in accordance with the agreement

the proposed indenture between the Scranton & Wilkes-Barre Traction Company and the Guaranty Trust Company as trustee has been duly executed. The first sinking fund operation will occur in May, 1918.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—The Mahoning & Shenango Railway & Light Company has recorded two mortgages, first and second, in Lawrence and Mercer Counties, for \$20,000,000 each, to the Guaranty Trust Company, New York. The company has also executed a mortgage for \$2,500,000 to the United States Mortgage & Trust Company.

Mansfield Railway, Light & Power Company, Mansfield, Ohio.—The consent of the Ohio Public Utilities Commission has been asked by W. H. Davey, Lewis Brucker, R. E. Burger, J. E. Louiseau and H. E. Butcher, incorporators of the Richland Public Service Company, to consolidate the holdings of the Mansfield Railway Light & Power Company, the Mansfield Public Utility & Service Company, the Mansfield Electric Light & Power Company and the Mansfield Gas Light Company as the Richland Public Service Company.

New York (N. Y.) Railways.—At the annual meeting of New York Railways on Dec. 3 the retiring directors were re-elected. A. D. Juilliard was also elected to the board in place of Seward Prosser, resigned.

Northern Ohio Traction & Light Company, Akron, Ohio.—The Northern Ohio Traction & Light Company has asked permission of the Ohio Utilities Commission to issue \$1,000,000 of five-year 6 per cent notes, to sell at best terms available, the proceeds to be used to reimburse the company for expenses already incurred. A hearing has been set for Dec. 10.

Norwood, Canton & Sharon Street Railway, Sharon, Mass.—The property of the Norwood, Canton & Sharon Street Railway recently sold for junk, has reverted to its owners, the intended purchaser having forfeited his deposit rather than become involved in certain litigation regarding the company.

Ocean Shore Railroad, San Francisco, Cal.—A. B. Sheperd has been elected a director of the Ocean Shore Railroad to succeed Henry E. Bothin.

Parkersburg & Ohio Valley Electric Railway, Parkersburg, W. Va.—In view of the fact that the Parkersburg & Ohio Valley Electric Railway, extending from Sistersville to Friendly, 5 miles, has been doing an unprofitable business, Charles E. Williams, receiver of the company, in a petition to the United States District Court at Parkersburg recommends that the line be dismantled and its effects sold at public auction.

Piedmont Railway & Electric Company, Burlington, N. C.—The Piedmont Railway & Electric Company is reported to have increased its capital to \$1,000,000. It is said to be the purpose of the company to change its name to the Piedmont Power & Light Company.

Southwestern Traction Company, Temple, Tex.—The property of the Southwestern Traction Company, which owns and operates an interurban railway between Temple and Belton, and the city lines in Temple, will be sold at public auction at Belton on Dec. 18, under an order issued out of the Federal District Court at Waco on Nov. 17. The sale is made under foreclosure to satisfy a mortgage held by the bondholders represented by the Susquehanna Trust & Safe Deposit Company of Pennsylvania. The sale will be conducted by W. G. Haag, Temple, as special master.

United Light & Railways Company, Grand Rapids, Mich.—Bonbright & Company, Inc., New York, N. Y., are offering the new \$1,500,000 issue of United Light & Railways Company 6 per cent bond-secured gold notes, Series A, recently authorized by the company. The notes are dated Nov. 1, 1917, and are due May 1, 1920. They are being sold at 96½ and interest, yielding 7½ per cent.

Virginia Railway & Power Company, Richmond, Va.—A special meeting of the stockholders of the Virginia Railway & Power Company has been called for Dec. 29 at Richmond, Va., for the purpose of ratifying the action of the directors, who at a recent meeting authorized the expenditure of \$1,000,000 for additional transmission lines.

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Oct., '17	\$79,191	*\$44,793	\$34,398	\$19,499	\$14,899
1 " " '16	77,173	*40,480	36,693	18,131	18,562
12 " " '17	873,287	*501,008	372,279	226,181	146,098
12 " " '16	815,966	*445,574	370,392	213,083	157,309

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., Oct., '17	\$89,429	*\$116,560	†\$27,131	\$30,310	†\$57,441
1 " " '16	109,024	*82,197	26,827	29,925	†3,098
12 " " '17	1,327,492	*1,057,549	269,943	357,432	†87,489
12 " " '16	1,225,482	*786,082	439,400	355,838	83,562

CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m., Oct., '17	\$1,659,665	\$29,646	\$1,630,019	\$226	\$1,629,793
1 " " '16	1,122,910	20,041	1,102,869	393	1,102,476
12 " " '17	18,706,604	337,251	18,369,353	2,984	18,366,369
12 " " '16	8,233,952	232,384	8,001,568	340,069	7,661,499

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.

1m., Oct., '17	\$267,632	*\$174,451	\$93,181	\$70,003	\$23,178
1 " " '16	251,683	*155,117	96,566	69,144	27,422
12 " " '17	3,065,173	*2,020,705	1,044,468	\$15,675	228,793
12 " " '16	2,828,567	*1,726,598	1,101,969	805,943	296,026

EAST ST. LOUIS & SUBURBAN SYSTEM, EAST ST. LOUIS, ILL.

1m., Oct., '17	\$307,827	*\$223,571	\$84,256	\$66,020	\$18,236
1 " " '16	271,636	*160,412	111,224	63,665	47,559
12 " " '17	3,579,998	*2,366,903	1,213,095	775,714	437,381
12 " " '16	2,911,182	*1,736,727	1,174,455	753,533	420,922

GRAND RAPIDS (MICH.) RAILWAY

1m., Oct., '17	\$103,246	*\$72,767	\$30,479	\$18,378	\$12,101
1 " " '16	103,659	*70,579	33,080	15,995	17,085
12 " " '17	1,308,025	*875,092	432,933	214,712	218,221
12 " " '16	1,286,511	*838,788	447,723	178,555	269,168

HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.

1m., Oct., '17	\$549,351	*\$264,198	\$285,153	\$217,823	\$67,330
1 " " '16	513,465	*230,840	282,625	215,691	66,934
4 " " '17	2,033,931	*990,719	1,043,212	870,941	172,271
4 " " '16	1,884,103	*860,077	1,024,026	859,430	164,596

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.

1m., Oct., '17	\$3,563,592	*\$1,916,581	\$1,647,011	\$1,079,033	†\$572,570
1 " " '16	3,546,933	*1,580,353	1,966,580	989,098	†1,032,194
4 " " '17	12,473,400	*7,118,611	5,354,789	4,282,788	†2,080,762
4 " " '16	11,937,021	*5,862,699	6,074,322	3,969,087	†2,327,542

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.

1m., Oct., '17	\$78,606	*\$60,625	\$17,981	\$15,512	\$2,469
1 " " '16	72,302	*49,895	22,407	15,166	7,241
12 " " '17	889,877	*662,903	226,974	186,216	40,758
12 " " '16	793,677	*536,681	256,996	189,025	67,971

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

1m., Oct., '17	\$211,324	*\$137,377	\$73,947	\$40,919	\$33,028
1 " " '16	205,999	*127,095	78,904	41,474	37,430
12 " " '17	2,439,835	*1,564,605	876,230	493,747	382,483
12 " " '16	2,355,769	*1,442,952	912,817	510,379	402,438

NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.

1m., Sept., '17	\$35,105	*\$26,924	\$8,181	\$7,982	†\$289
1 " " '16	31,411	*22,855	8,556	7,987	†626
9 " " '17	317,507	*264,472	53,035	71,854	†118,336
9 " " '16	285,408	*224,897	60,511	71,862	†10,947

NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.

1m., Sept., '17	\$46,747	*\$46,643	\$104	†\$6,176	††\$5,352
1 " " '16	50,689	*45,996	4,693	†5,804	††321
9 " " '17	417,909	*415,359	2,550	†68,039	††56,975
9 " " '17	402,950	*439,942	†36,992	†73,475	††66,647

NORTHERN TEXAS ELECTRIC COMPANY, FT. WORTH, TEX.

1m., Sept., '17	\$252,877	*\$130,137	\$122,740	\$29,126	\$93,614
1 " " '16	161,044	*94,256	66,788	29,416	37,372
12 " " '17	2,270,221	*1,307,559	962,662	349,647	613,015
12 " " '16	1,862,691	*1,139,551	723,140	343,587	379,553

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

1m., Oct., '17	\$2,602,140	\$1,514,809	\$1,087,331	\$810,889	\$276,442
1 " " '16	2,417,096	1,330,594	1,086,502	814,450	272,052
4 " " '17	9,895,799	5,738,589	4,157,210	3,245,825	911,385
4 " " '16	9,007,921	4,986,327	4,021,594	3,259,138	762,456

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

1m., Oct., '17	\$452,968	*\$316,266	\$136,702	\$85,515	†\$55,617
1 " " '16	338,613	*188,922	149,691	69,070	†81,773
12 " " '17	4,650,883	*3,072,278	1,578,605	972,052	†657,206
12 " " '16	3,879,282	*2,242,753	1,636,529	802,957	†849,722

*Includes taxes. †Deficit. ††Includes non-operating income. ‡Includes accruals, under rapid transit contracts, with city, payable from future earnings. ‡‡Excludes interest on bonds, charged income and paid by the New York, New Haven & Hartford Railroad under guarantee, also interest on notes held by the New York, New Haven & Hartford Railroad, not credited to income of that company.

Traffic and Transportation

Results with Six-Cent Fares

Vice-President Stearns of Bay State Railway Also Explains Basis of Proposed Interurban Fare Zones

R. B. Stearns, vice-president of the Bay State Street Railway, was a witness before the Massachusetts Public Service Commission on Nov. 19 at a hearing upon the proposed establishment by the company of a standard zone system of fares on its interurban lines. A résumé of the company's opening was published in the ELECTRIC RAILWAY JOURNAL for Nov. 24, page 942. The lines affected are those extending from one large community to another, except in so far as certain lines for through traffic are susceptible of the distance basis or the mileage charge. At present 6-cent fares are being charged for zones of irregular length, varying on the lines south of Boston from 1.67 to 7.02 miles and on the northern lines from 1.26 miles to 7.93 miles.

To avoid these discriminations the lines were cut up into practically equal 1-mile zones, giving about 373 units on the northern and southern lines. The longest zone, or so-called "mile," is about 1.3 miles and the shortest about 0.75 mile, the exact limits of these zones being determined by the locations of the natural traffic centers. On the zones thus established the company proposes a minimum fare of 6 cents and a rate per zone as described below.

The company has a number of lines, especially summer traffic routes, near the shore, where it was almost hopeless to establish a rate of fare that would pay expenses and yield a reasonable return, and where the patrons probably would not purchase the service at a charge of more than 3 cents per mile. "We feel," said Mr. Stearns, "from previous cases, that generally speaking the centers or large cities on this system are greatly benefited by the feeders, and that the rate of fare in these cities should be such as to stand a portion of the losses in these feeders if losses exist." A rate of 3 cents per mile was accordingly fixed on the non-productive lines, such as the Nantasket Beach line, the line from Bridgewater to New Bedford, a very sparsely settled territory, the Ipswich-Essex line and the Billerica-Wilmington line.

The 2-cent minimum rate per mile is regarded in steam railroad and in interurban service as the lowest rate below which it is impossible to render service without operating losses. Practically the largest part of the Bay State lines is therefore scheduled at the 2-cent rate; but where the 2 and 3-cents per mile lines have a relation the rate is blended in a 2½-cent-per-mile rate.

The variable rate per mile is predicated on two factors, the density of traffic or population and the gross revenue per mile of track. Some of the lines earned as low as \$1,800 per mile of single track per year; one earned as high as \$18,000. The average of the entire so-called interurban system was \$4,800 per mile per annum, gross earnings. The average for the entire Bay State system is about \$11,000. On the interurban lines the company failed by about \$600,000 a year to take in enough money to pay the expenses without considering interest, taxes or depreciation; in other words, there is an operating loss of 4.98 per cent on the investment of about \$12,000,000 (interurban lines) on the commission's basis. The cost of the interurban service was estimated from an average of the entire system. The average investment per mile of track on the entire system, on the commission's basis brought down to date by subsequent additions to the property, is \$28,700.

RESULTS OF SIX-CENT FARE OPERATION

The company finds that the revenue on the system as a whole is being increased about \$600,000 per year by the change from 5 cents to 6 cents, including both interurban districts and city centers. About \$400,000 of the above is secured from the 6-cent fare in the urban centers. Nevertheless it is estimated that the 1917 total earnings in urban

centers on the present 6-cent fare basis in places where 5 cents was the original rate, will be only \$8,320,000 or \$254,000 less than the total cost of the service, including reasonable return and depreciation. The reasonable return is the 6 per cent fixed by the commission on the investment aggregating about \$40,024,000, of which \$27,000,000 is apportioned to these large centers. The depreciation is also that determined by the commission in its original order only, amounting to 5.08 per cent on the low investment values determined by the board. Since the 1916 decision some \$900,000 has been invested in the property.

Taking the system as a whole, exclusive of the small proportion of its mileage located in other States, the gross revenue for 1917 is estimated at \$10,245,375, the estimated cost to render the service being \$11,863,526, including a 6 per cent return on the investment. Actually it appears that only 1.97 per cent will be earned on the investment. The new fare system in the interurban territory, it is thought, will increase revenue about \$530,000, depending on traffic losses, leaving the company, even after the adoption of the zone system, with about \$1,100,000 less revenue than it absolutely requires under the commission's basis. If isolated lines still show large deficiencies, there will be no recourse but the removal of those lines.

It is expected that intensive economies now being practised on the system will save the company from \$250,000 to \$300,000 per year. Studies indicate that about fifty one-man cars can be used and that the annual resulting saving in operating expense would be about \$30,000, the investment being about \$300,000 for such equipment.

Referring to the fact that the company has lost money on short riders under the present 6-cent schedule, Mr. Stearns said that while he naturally would like to get that back, what is really being sought is to produce a system which yields a slightly increased net, eliminates discrimination, is flexible and provides the same minimum fare on the interurban lines as in the large centers to which the interurban lines are adjacent.

Freight Increase Hearing in Indiana

Interurban Electric Railways Submit Their Case to the Public Service Commission—Present Tariffs Hit and Miss

Representatives of the electric railways of Indiana appeared before the Public Service Commission on Nov. 30 and presented their applications for an increase of freight rates. The case of the interurban lines was presented by Charles L. Henry, president of the Indianapolis & Cincinnati Traction Company.

H. B. McNeely of the traffic department of the Indianapolis Chamber of Commerce; H. E. Fairweather of the Fort Wayne traffic bureau, and city attorneys of such towns as Crawfordsville, Delphi and Lafayette, appeared to represent the shippers in their territories.

No protests against the proposed increased rates were heard from any shippers during the hearing. Mr. Henry informed E. I. Lewis, the chairman of the commission, that the situation as to freight conditions with all of the interurban railways was so nearly alike that when he had heard one he had heard all. The origin of interurban business was outlined by Mr. Henry in his preliminary statement. He declared that it was not the original intention of the electric roads to engage in the freight business.

The question of whether the proposed increases in interurban rates would accentuate glaring inequalities and alleged discriminations in rates at certain points in the State was brought up, and representatives of the shippers said they were insisting that in any revision of rates the question of uniformity should guide the commission in approving schedules.

Mr. Henry stated that the proportion of the freight business to the other business of the interurban railways was just about the reverse of the steam lines. Seventy-five per cent of the business of the steam lines was freight. It was safe to say that the business of interurban companies in freight would run a little less than 10 or 15 per cent. Mr. Henry declared that the car expense of interurban freight was very much in excess of that of the steam lines on

account of the short hauls, limited number of train cars and nature of freight. He said that the freight car cost a car-mile for car help alone was 5 cents a mile more than the passenger costs a car mile. The traction companies' freight was virtually express business and the traction companies were entitled to a higher freight rate on account of the higher character of business, compared to steam-line freight.

HODGE-PODGE FREIGHT TARIFFS OF ELECTRICS SPELL RUIN

Mr. Henry's position was made somewhat clearer as to his steam line comparisons when F. D. Norviel, general passenger and freight agent for the Union Traction Company of Indiana, read a statement of how the present interurban freight rates were adopted in most cases to compete with parallel steam lines rather than having originated in any scientific manner. Mr. Norviel said that it had been assumed that the traction companies could handle freight as cheaply as steam lines. This was a mistake that proved very costly to the traction lines. His prepared statement pointed out how the steam-line freight tariffs were an admitted hodge-podge and that in following them as models the electric railways had been led into even gross lack of uniformity.

Mr. Norviel stated that he had been chairman for four years of a committee of electric railways in a number of Middle Western states, and that he and his committee had been trying to work out what was believed to be a fair class rate for the electric railways. For a time the electric railways waited on the steam lines, which were conducting much of the same sort of an investigation, but when the looked-for improvements were not forthcoming it was decided to pursue an independent course. Mr. Norviel testified to the effect that the submitted tariffs were "purely speculative," and that they "would make on the average interurban road in Indiana an increase of 15 or 20 per cent above the present tariffs." He said that the present rates were made in 1908 and put into effect in 1913.

TRAFFIC BUREAU REPRESENTATIVE STATES HIS CASE

Mr. Fairweather pointed out that the proposed increases had not been granted for interstate traffic, and that if they became effective gross inequalities would exist in rates near state-line points. He mentioned Fort Wayne and points east as an example. He said: "What I am appearing for is uniformity. We have no special fight against the interurbans and no protest except as the rates are not uniform." He introduced a number of exhibits intended to show irregularities in the rates.

Mr. McNeely said that he did not appear as a protestant, but to learn what was going on and to obtain the right to question the witnesses and to file a brief in the case if necessary. His attitude was concurred in by John B. Murphy, Crawfordsville; E. B. Davidson, Lafayette; E. E. Pruitt, Delphi, and others appearing for shippers.

Mr. Henry called the attention of the commissioner to the necessity of building up the transportation companies of the United States. He declared that he had a petition signed by forty business men of Shelbyville on behalf of the company's petition for increased freight and passenger rates.

Walter Schroyer, auditor of the Union Traction Company of Indiana, testified that the freight business showed a deficit each year since 1911. This statement was substantiated by John H. Crall of Indianapolis, general passenger and freight agent for the Terre Haute, Indianapolis & Eastern Traction Company; Leroy T. Hixson, auditor of the Terre Haute, Indianapolis & Eastern Traction Company, and others. Exhibits were offered showing how rates about 20 per cent higher would affect the roads advantageously and relieve the situation.

THE COMMISSION'S ATTITUDE TOLERANT

Chairman Lewis called repeatedly for more definite analyses of the generalities submitted and cautioned the representatives of the electric railways that details and explanations of how they had arrived at certain statements would be necessary to a correct inquiry into the facts upon which depended the granting of the petition. Considerable testimony of a technical nature was presented. Shipper

and carrier alike were assured by Chairman Lewis that when orders were finally issued uniformity of tariffs would be a feature. Any relief will come to the companies individually. Mr. Lewis may call for individual information from the companies.

The original petition was filed by the Terre Haute, Indianapolis & Eastern Traction Company last September. Since that time many other interurban railways have followed suit. Roads represented at the hearing were the Terre Haute, Indianapolis & Eastern Traction Company, the Ohio Electric Railway, the Fort Wayne & Northern Indiana Traction Company, the Fort Wayne & Decatur Traction Company, the Southern Michigan Railway, the Chicago, South Bend & Northern Indiana Traction Company, the Union Traction Company and the Indianapolis & Cincinnati Traction Company. About forty persons attended the hearing.

Fare Change Working Well

Mileage Rate System in Use Since October Satisfactory on Boston & Worcester Street Railway

C. D. Emmons, second vice-president and general manager of the Boston & Worcester Street Railway, testified in the Bay State fare-zone hearing at Boston before the Public Service Commission of Massachusetts, on Nov. 19, that the copper or mileage zone system was working out well on the interurban line in his charge. This system of fares has been in use on the road since Oct. 1. Mr. Emmons said that the company, confronted with the necessity for raising additional revenue, considered two methods, first, the possibility of changing the old 6-cent zone fare to a higher rate, and, second, disregarding the former zone system and substituting a mileage basis. The mileage basis represented an actual equalization of fares, and enabled the company to retain the old 6-cent fare minimum, so that the fare of the short rider was not disturbed. The change wiped out inequalities in many places, notably between Newton and Wellesley. On the old basis some patrons would ride a mile and on crossing the zone limit would have to pay a total fare of 12 cents. Those riders now get a minimum of 6 cents. In some places the minimum fare was changed from 12 to 8 cents; in others from 12 to 10 cents. On the whole, however, the company received an increased revenue.

The first month of the new system's application, October, did not show the full results expected later, for the reason that many old tickets held by patrons were taken up by the conductors. There was an actual gain in revenue that month of about 5.5 per cent, and in November the revenue showed an increase of about 10 per cent compared with the old system of rates. The latter is about what the management expected to secure from the mileage system.

NEW SYSTEM WORKS WELL

From the operating standpoint the system was working out very well. Previously the conductors had to go through the cars between Chestnut Hill and Lake Junction (between the terminals of the Boston and Worcester local systems) nine times and ring up the fare nine times for every person in the car. This was annoying to both conductor and passengers. The fare under the old plan used to be 50 cents, and by the mileage system it has been raised to 62 cents. One collection is made and a receipt given to the passenger by which he makes one payment all the way through, about 30 miles, and delivers his check at the end of the ride. The conductor does not ring in any fares, the fare check being the method of accounting to the company. Mr. Emmons said that the public has taken kindly to the mileage system. Under the old plan the passenger might travel 3 miles for 6 cents on one part of the road and 10 miles, or thereabouts, for 6 cents on another part. By the equalization of the mileage system the public felt that it was getting justice on all the lines. The company sells mileage tickets at the rate of 100 miles for \$1.70. Monthly tickets in the Overbrook section of Wellesley are not used to any great extent. The public preferred to use the mileage book as this enabled riders to travel anywhere on the system.

Five-Cent Fares in Detroit

Detroit United Railway Abrogates Ticket Agreement With City—Politics Prevented Help to the Company

The Detroit (Mich.) United Railway on Dec. 1 abrogated the seven-for-a-quarter ticket agreement into which it entered with the city on Aug. 7, 1913. The company on the following day, Dec. 2, began charging straight 5-cent fares on all city lines with the exception of the Sherman, Fourteenth, Crosstown and Harper lines, being obliged to continue eight-for-a-quarter and six-for-a-quarter fares on these lines under the old Pingree franchise, which still has seven years to run.

THE CITY HITS BACK

By way of reprisal against the company for the fare raise the Common Council of the city at a session on the night of Dec. 4 adopted a resolution directing the company to pay approximately \$10,000 a day rental for the use of streets on which franchises have expired; rescinded permission to the company to operate skip stops on practically all of the city lines; recalled the resolution under which the company had rerouted many lines down town; placed at the disposal of the Municipal Railway Commission a fund of \$35,000 to employ Barclay Parsons & Klapp, New York, engineers, to make an investigation to determine whether the fare increase was justified, and instructed the Corporation Counsel to ascertain whether the company has any right to operate freight and interurban cars within the city of Detroit.

The warfare will undoubtedly reach the courts in several proceedings within a short time. Already four cases in which the right of the Common Council to grant the company permission to operate under the skip-stop system are pending in the Recorder's Court.

PRESIDENT BROOKS STATES THE COMPANY'S CASE

In announcing to the Municipal Railway Commission, the Mayor and the Common Council that the Detroit United Railway had determined to break the agreement with the city, Frank W. Brooks, president of the company, said in part:

"The conditions making this course necessary are regretted as much by ourselves as anybody else. The present rates of fare in Detroit are not yielding income sufficient to meet ordinary operating expenses. The men in the service must be paid for their labor; taxes must be paid; we must pay for necessary materials, and we are not now getting enough money to do these things, to say nothing about providing for interest and dividends. Our operations for the month of October were on the basis of an annual deficit of more than \$2,000,000. Even the rates of fare in effect prior to Aug. 7, 1913, are insufficient to yield, under present conditions, a return upon the capital invested, and it is certain these conditions cannot be improved immediately."

Mr. Brooks then said that the company would continue in effect the universal transfer system as well as the eight-for-a-quarter tickets good between 5 and 6.30 a. m. and 4.45 and 5.45 p. m. on the so-called 5-cent lines. On the so-called 3-cent lines (Sherman, Fourteenth, Crosstown and Harper) the rates of fare are eight tickets for 25 cents between 5.15 a. m. and 7.30 p. m. and six tickets for 25 cents good at all hours. The straight 5-cent fare applies to all other lines, except for the two periods of the day when workingmen's tickets are accepted.

INVESTIGATION OF COMPANY WELCOMED

The company in announcing the increase in fares invited the city authorities to make a thorough investigation of its books, declaring that such an inquiry would prove the contention that a 5-cent fare was necessary to keep the company alive. In ordering the investigation, however, the Council decided to investigate only the earnings and expenses of the so-called 5-cent lines where franchises have expired and not to take into account the earnings or expenses of the 3-cent lines. Company officials characterize this segregation plan as absurd. The 3-cent lines have been operating at a deficit averaging \$40,000 a month and have been sustained by the earnings on the balance of the system. The company is willing to afford all facilities for an investigation of the city lines

as an entirety, but is apparently opposed to the limited investigation which is proposed.

Company officials declare that the change in rate of fare came about because the city authorities failed to co-operate with the company toward war-time economies. The company hoped by the installation of skip-stop service and through rerouting of cars to effect economies which would make it unnecessary at this time to increase fares. According to a statement issued by the company, political factions in the Council played football with the electric railway question. The company's statement on this point says:

POLITICS PLAYS ITS PART

"We had unmistakable information that at no time did either of the political factions intend that any relief should be provided to meet the war-time conditions. On the other hand each faction planned to outdo the other to hold up the matter indefinitely for whatever advantage might come to them politically. Each wanted the slogan 'We Kept Car Fares Down' for use at the next election. Because of this situation the company acted without further delay, as has been stated, and within its legal rights, to the end that there might be sufficient revenue to render proper service to the car riders. In all sincerity we advise the public to weigh in the balance the course of the present Common Council."

The company will probably obey the Council's order regarding skip stops and rerouting, and also put cars back on the old routes. Reverting to the old arrangement will mean lengthening running time and also mean that many trail cars will be taken off and double-truck cars will be replaced by cars of the single-truck type.

The Council under a decision rendered five years ago by the United States Supreme Court in the Fort Street rental case has a right to order the company off of streets where franchises have expired. Such an order would affect approximately twenty lines. It is unlikely, however, that the Council will take this drastic step because a cessation of service would cripple plants which are making munitions of war for the government. On the other hand, the company could cancel transfer rights and the workingmen's tickets, both of which are voluntary concessions by the company.

Preparing for Cleveland Fare Advance

Increase in Fare on Dec. 15 Looked Upon as Inevitable—Review of Fare Changes Under Tayler Grant

Officials of the Cleveland (Ohio) Railway have announced that the interest fund on Dec. 1 was \$257,923. They are making arrangements to increase the fare on Dec. 15 to 4 cents cash and three tickets for 10 cents. Council has been asked to allow the company to advance the fare two steps at the same time. The only difference between the next two is the charge of 1 cent for transfers. Officials say that the receipts will be no larger than they have been if only the charge for transfers is rebated, as the next higher rate under the ordinance would require. The matter has been referred to the street railway committee.

There have been three changes in the rate on the Cleveland Railway since the Tayler franchise went into effect on March 1, 1910. The interest fund, which serves as the fare barometer, was started with an appropriation of \$500,000 and a rule was adopted that when this fund reached \$700,000, the fare should be reduced, and when it fell below \$300,000, it should be increased.

At that time the fare was fixed at 3 cents merely as a starting point and a charge of 1 cent was made for transfers, with no rebate. This rate continued to May 31, 1911, when the fund amounted to \$700,000. The fare was then reduced to the next lowest rate by eliminating the charge for transfers. It remained at this point until Sept. 1, 1914, when the interest fund had fallen below the required \$300,000. The rate went back to the first schedule of 3 cents and a charge of 1 cent for transfers, without rebate, where it has remained until the present time. The interest fund had fallen to approximately \$200,000 by Oct. 1, 1911, and then had gradually grown to about \$500,000, when prices of materials and labor began to advance as a result of the war. The trend was then the other way and the fund has gradually dwindled.

Trenton Fare Case Argued

Frank S. Katzenbach, Jr., representing the Trenton & Mercer County Traction Corporation, Trenton, N. J., on Nov. 27 argued before the Court of Errors the appeal of the corporation from the decision of the Supreme Court in upholding the order of the State Public Utility Commission, which refused permission to the company to abolish its six-for-a-quarter tickets. Counsel for the utility board and the city of Trenton failed to appear, but they may submit briefs in twenty days. The court has been closed for the term. The company in its notice of appeal sets forth fifteen contentions why the decision against it was not in accordance with law and why the company should be allowed to charge a straight fare of 5 cents per passenger for all more than five years of age.

Mr. Katzenbach maintained in his argument that the change in fare would not actually amount to an increase. He also contended that in its valuation of the company's property the commission did not allow for a fair return on the outstanding stock. Mr. Katzenbach further maintained that the inhabitants of Trenton had no authority to pass the ordinance of Oct. 22, 1909, providing for the sale of strip tickets, and that as the company did not enter into any agreement with the city it cannot be bound by the ordinance.

Hearing on Hartford Fares

Connecticut Commission Opens Case of Hartford Against the Six-Cent Fare of the Connecticut Company—Another Hearing on Dec. 10

The Public Utilities Commission of Connecticut held a hearing on Dec. 3 on the petition of the Board of Aldermen of Hartford protesting against the 6-cent fare adopted recently by the Connecticut Company in that city. The city was represented by Corporation Counsel Francis W. Cole. The Connecticut Company was represented by J. K. Punderford, vice-president and general manager; Edward M. Day, Hartford, and J. F. Berry and George D. Watrous, New Haven.

CITY'S SIDE PRESENTED

Mr. Cole insisted that the Hartford lines should be considered separately from the rest of the system. He said that if the local lines in Hartford paid a good return on their investment and the suburban lines did not the city should not be called upon to make up the losses on the other lines. Mr. Cole said that he had not been successful in his effort to obtain from the Connecticut Company details of the receipts and expenses for the lines in Hartford. To this Mr. Berry replied that the company did not wish to have accountants for several cities go over the books separately, but that if the commission wished to appoint accountants for the purpose the company would be glad to give them access to all the data in its possession. Mr. Cole suggested in the interests of economy that one-man cars be operated. He declared that such vehicles would be more successful in competing with the jitney than are the present cars and that such cars would save platform expense and be much more economical than the cars now in use.

COMPANY OUTLINES ITS CASE

Mr. Berry stated the situation from the company's standpoint. He said that the difficulties which the electric railways were facing were due to the inflexible 5-cent fare and to the constantly increasing costs of operation. These costs had reached a point where the service had to be curtailed or the rate of fare increased. The company proposed to show the general conditions surrounding electric railways at present by submitting testimony of witnesses who had made a study of the situation and were familiar with the action taken by companies and commissions elsewhere.

FUTURE APPEARANCES NOTED

In this connection Mr. Berry noted the future appearance for the company of Dr. Thomas Conway, Jr., professor of finance, University of Pennsylvania, M. C. Brush, president of the Boston Elevated Railway, and others. He said the system must be treated as a unit and not by divisions. If the

various lines of the company were segregated and each was treated as a unit the result would be that the non-paying lines would have to be abandoned or the rate charged would have to be so high that it would prohibit riding. He said that one of the trustees for the company under the federal dissolution decree would testify in regard to the manner in which the company had been managed for the last three or four years. A valuation had been made of the property of the company which would be checked and approved by Prof. George F. Swain of the Boston Transit Commission and the Massachusetts Institute of Technology. A representative of Stone & Webster would testify from his general inspection of the property as to its physical condition.

Testimony from Dr. Conway was presented in the afternoon. The hearing was then adjourned until Dec. 10.

Increase in Fare in Lexington

The Kentucky Traction & Terminal Company, Lexington, Ky., has announced an increase in fares from 5 cents to 6 cents. The company, in a statement said that the advance had been made necessary by the increased cost of materials and other expenses. The board, at a recent meeting, gave the matter lengthy consideration and determined that the action was necessary. The company will sell tickets at the rate of six for 35 cents. Half-fare tickets will be sold for 3 cents. The statement of the company said:

"The company feels sure the people of Lexington will realize the situation which confronts it, and that it will understand that it is a matter of absolute necessity for the company to increase its fare."

On July 1 the company discontinued the sale of six metal tickets for a quarter. This change was noted in the *ELECTRIC RAILWAY JOURNAL* of July 14, page 80.

Copper-Zone System for Connecticut Line.—The Hartford & Springfield Street Railway, Warehouse Point, Conn., has announced that on Jan. 1 it will establish the 2-cent copper-zone system with a minimum fare of 6 cents.

Metal Half-Fare Tickets in Denver.—The Denver (Col.) Tramway is now using metal half-fare tickets instead of the paper tickets. The tickets are a little smaller than a dime and are dropped in the fare box with the regular fares.

Women Operators for Pittsburgh.—The Pittsburgh (Pa.) Railways on Nov. 30 advertised in the afternoon papers for women conductors to operate trippers and trailers. Women desiring employment were invited to make application by letter. It was stated that about 200 would be needed.

Trenton Retains Peter Witt.—Peter Witt, Cleveland, Ohio, has been retained by the city of Trenton, N. J., to inquire into the electric railway situation there and to report to the city his recommendations for such changes and improvements as will work to the best interests of the city as a whole.

Application for Fare Increase on Interurban Line.—The Alton, Granite & St. Louis Traction Company, Alton, Ill., has asked the Interstate Commerce Commission for permission to increase the round-trip fare on its line from Alton to St. Louis from 90 cents to \$1. No plea was made by the company affecting the one-way rate of fare.

Coal Shortage in Detroit.—The Detroit (Mich.) United Railway has announced that, owing to the coal shortage, its cars will not be heated as much as they have been during other seasons. While the company has some coal on hand, the amount is but a fraction of the usual supply, and it will be necessary to conserve the supply as long as possible.

Union Objects to High School Pupils on Cars at Trenton.—The union of trainmen has objected to the plan which the Trenton & Mercer County Traction Corporation, Trenton, N. J., had under consideration of using male pupils from the Trenton High School to operate cars during the rush hours. Dr. William A. Wetzel, principal of the school, had approved the idea.

Pay-as-You-Pass Cars in Buffalo.—Forty-five of the new center-exit Peter Witt type of cars have been placed in operation on the Niagara and Grant Street lines of the

International Railway, Buffalo, N. Y. It is expected that the other fifty-five cars will be received from the Kuhlmann Company, Cleveland, at the rate of ten a week. They will be placed in operation on the Main Street line.

Round Trip 70-Cent Fare Not Taxable.—A ruling has been made by the United States Treasury Department that round-trip tickets costing 70 cents or less are not taxable under subdivision C, section 500 of the act of Oct. 3, 1917. This ruling was contained in a letter to the Central Electric Railway Accountants' Association signed by G. E. Fletcher, deputy commissioner, Washington, D. C.

Detroit Being Told About One-Man Cars.—The Detroit (Mich.) United Railway intends to present to its patrons through *Electric Railway Service*, its official publication, information and data concerning the new one-man cars which are now in successful operation on electric railway properties throughout the country. The articles will be illustrated with exterior and interior views of the new type of car.

Another Indiana Interurban Requests Increase in Fare.—The Chicago, South Bend & Northern Indiana Traction Company petitioned the Public Service Commission of Indiana on Nov. 26 for authority to put into effect a 2½-cent fare instead of a 2-cent fare. This is the second electric railway in Indiana to petition for this rate of fare on its interurban lines. The company operates between Goshen and Michigan City, through Elkhart, South Bend and other towns.

Increase in Fare on Vermont Road.—The Bellows Falls & Saxton's River Railroad, Bellows Falls, Vt., has increased its local fares in Bellows Falls from 5 cents to 6 cents. On the line to Saxton's River there have been three 5-cent zones. One cent has been added to each of these, making the fare 18 cents instead of 15 cents. On the line to Barber Park there have been two 5-cent zones. One cent has been added to each of these, making the fare 12 cents instead of 10 cents.

Arranging for Texas Fair Traffic.—Officials of the Texas State Fair at Dallas, Tex., and of the Dallas Railway are considering improvements at Fair Park for handling the immense traffic during the fair. N. M. Baker, supervisor of public utilities of Dallas, has suggested that loading tracks be built in an inclosed place with turnstiles at the entry gates, and fares be collected at the gates before people enter to board cars. This suggestion is approved by Richard Meriwether, general manager of the Dallas Railway, and other traction officials.

Auto Buses Differentiated from "For Hire" Cars.—According to a ruling of the Supreme Court in the case of the State of Washington against the Ferry Line Auto Bus Company, operating in West Seattle, a suburb of Seattle, auto buses, operating along regularly established routes, must carry "auto stage" and not "for hire" licenses. The Supreme Court's ruling affirmed the ruling of the Justice Court in Seattle, where a driver of the company was arrested and fined \$150 for driving an unlicensed car. The auto bus line connects with the Port Commission ferry.

Traffic Inquiry Proposed in Washington.—The Public Utilities Commission of the District of Columbia has under consideration an emergency investigation of electric railway conditions in Washington growing out of the unusual demands which are being made on the Washington Railway & Electric Company and the Capital Traction Company as a result of the unprecedented increase in the number of transients in Washington and the accession to the population of semi-permanent residents. The commission has been in communication with John A. Beeler, New York, with respect to his conducting the inquiry.

Through Routes and Joint Rates Denied.—The Public Service Commission for the Second District of New York has denied the application of Edwin W. Fiske, Mayor of Mount Vernon, asking that the commission take steps to establish through routes and joint rates by the Westchester Electric Railroad and the Yonkers Railroad between Mount Vernon and Yonkers. In denying the application the commission advances the opinion that from the evidence presented and from its knowledge of the financial conditions of the electric railways involved there would be no justification for making this arrangement.

Speeding Up Portland Service.—Operating officials of the Portland Railway, Light & Power Company, Portland, Ore., are exhausting every means to devise ways for reducing the number and length of delays at heavy loading and unloading points over the system. The policy has been adopted in pursuance of suggestions made in the recent decision of the Public Service Commission in the 6-cent fare case. One of the first points of attack is to reduce, if possible, the delays incident to excessive congestion during the rush hours in the evening "peak-load" period. The company has appealed to the public to co-operate in the efforts to improve service.

Front-Entrance Cars for Columbus.—The Columbus (Ga.) Railroad proposes to place the Birney type of front-entrance car in operation on its belt line as soon as the cars are received. This is expected to be about Jan. 1. To accustom people to the front-entrance prepayment type of car the company rebuilt some of its present semi-convertible cars as front entrance vestibuled cars. The plan is gradually to introduce the Birney car on all the lines at the rate of one or more lines a year if war conditions and deliveries make this possible. To explain to the public the reason for the change the company printed and distributed a pamphlet, "The Way of the Front-Entrance Car."

Prize Contest on Indiana Line.—The Union Traction Company of Indiana, Anderson, Ind., has announced its seventh prize contest. It will give \$30 in gold to its employees for the best papers on "How Does the Obedient and Orderly Man Promote Safety First?" The contest is open to all employees, except department heads and sub-heads. The papers will be read at the next safety-first get-together meeting, at which time the prizes will be distributed. A first prize of \$15, a second prize of \$10 and a third prize of \$5 will be awarded to the writers of the best three papers. The subject was selected by the General Safety Board and the local representatives. Thirty different suggestions for topics were presented.

Report on Service in Camden.—The Board of Public Utility Commissioners of New Jersey has given out a report on electric railway conditions in Camden, N. J., investigated by its inspector. The commission recommends additional service on several branches during the rush hours and calls attention to the inability of the Public Service Railway to obtain cars needed for relieving conditions in such hours. The report further says that many plants have been built in Camden and Philadelphia during the last two years and that thousands of additional employees make better service necessary. These conditions will be relieved when the company receives the twenty-five large new cars ordered last winter for delivery last summer.

Possible Zone System for Washington Jitneys.—The Public Utilities Commission of the District of Columbia is planning to reopen the question of the charge to be allowed for jitney service in the District. Early last fall the commission put into effect an order limiting the fare to 5 cents, and it has just recently received its first application from a licensee for permission to charge 10 cents. It is the plan of the commission to request all jitney operators to submit their views as to the reasonableness of the 5-cent fare. When the replies have been received a date will be set for a public hearing. It is said to be probable that the utilities board will consider the advisability of establishing a zone system for jitneys, which would regulate the amount of fare to be charged.

Richmond Company Seeks Suggestions from City.—Thomas S. Wheelwright, president of the Virginia Railway & Power Company, Richmond, Va., has petitioned the Common Council of that city to suggest some remedy for meeting the unprecedented increase in all operating costs. At the request of the company the petition will be considered by the finance committee, which will report what relief can be granted and upon what conditions. In a companion resolution, the company also petitioned the Council to be allowed to introduce the skip-stop system on the Main Street line for a period of ninety days. This resolution was referred to the committee on streets. The first hearing on the relief petition was held on Nov. 26. Further consideration of the matter was then put over until Dec. 10.

Fare Boxes and Metal Tickets in Dallas.—The Dallas (Tex.) Railway has ordered new cash fare boxes for installation on all cars in Dallas. The boxes will register the four different rates of fare now charged. There will be a place for the regular 5-cent fare, another for the commutation fare of twenty-two rides for \$1, another for the school children's half fare and another for special fares. Richard Meriwether, general manager of the company, says that when the fare boxes are installed metal checks will be sold as tickets instead of the card tickets now in use. They will come wrapped in packages, twenty-two of the commutation fares in a package for \$1 and twenty of the children's half-fare checks in a package for 50 cents. The new system will be put in use in Dallas about Jan. 1.

All Long Island Increases Refused Except One.—The Public Service Commission for the First District of New York, in a decision rendered during the week ended Dec. 1, refused with a single exception to permit the Long Island Railroad to increase its passenger fares within the city of New York as proposed in tariffs which were filed by it last April and May and suspended by the commission. The single increase permitted is in the mileage rates, the advance being from 2 to 2¼ cents per mile, and is in keeping with a similar increase permitted recently by the Public Service Commission for the Second District as applying to passenger transportation under its jurisdiction. The rate increases proposed in the First District affected several classes of tickets, including single-trip, round-trip, ten, twenty and fifty-trip tickets and mileage.

I. T. S. Talks to Peoria Public.—The Peoria (Ill.) Railway, included in the Illinois Traction System, is conducting a series of heart-to-heart talks with its patrons in the daily papers of Peoria. The series is entitled "Street Car Thoughts for To-Day," and is illustrated with the picture of a conductor showing passengers the way into a car of modern type. In the center of the illustration appear suggestions and points of general interest to the passengers. The underlying idea is to obtain close personal contact with patrons through the medium of daily education and suggestion. In a recent issue of the Peoria papers the company very unselfishly devoted its advertising space to an announcement of the "Sammies" Christmas Party, the proceeds to be used in buying a Christmas package for every person in war service from Peoria County.

Safety Island and Shelter for Buffalo.—The City Council of Buffalo, N. Y., has delayed consideration of the application of the International Railway for permission to enlarge the safety island in Shelter Square and build a steel shelter for the convenience of more than 40,000 passengers who board cars at this point every day. The Council believes that the proposed structure should be built by the city and leased to the railway. It is proposed to spend \$10,000 for the construction of the shelter. The building will be of steel with a red ornamental tile roof, inclosed on three sides, with a public comfort station under the street. At a recent conference of members of the City Council, representatives of the railway and private architects, some details of the enlargement of the safety island were agreed upon, but the railway officials announced that they would prefer to have the company build the station rather than to arrange to lease it from the city.

Safety Equipment Prevents Accident.—An interesting incident is reported in connection with the operation of safety cars, in which a near-accident was averted the other day in Greensboro, N. C., where fifteen new safety cars are in service. A safety car was following another somewhat closely down the street, when the first car stopped to take on passengers. The operator on the second car did not notice that the car ahead had stopped, until he was very close to the rear of the first car. He then became excited, and instead of applying the brakes in emergency, he reversed his motors and in so doing knocked out the circuit breaker, without shutting off the power controller. In doing this he removed his hand from the controller handle. The brakes were thus immediately applied in emergency and the second car was stopped just as the two cars came together. It is apparent that if the motorman had relied on reversing his motor to stop the car, a serious accident would probably have resulted.

Personal Mention

F. M. Black has resigned as a member of the Alberta Public Utilities Board, in order to give his full time to his work as assistant to the food controller.

Chester A. Walling has resigned as superintendent of transportation of the Jersey Central Traction Company, Keyport, N. J., to enter the newspaper business.

William Haley has been appointed superintendent of transportation of the Jersey Central Traction Company, Keyport, N. J., to succeed Chester A. Walling, resigned.

A. S. Muirhead has been elected vice-president of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., to succeed W. O. Morgan, now president of the company.

Howard Rhoda, formerly with the Binghamton (N. Y.) Railway, has been placed in charge of the carhouse of the Trenton & Mercer County Traction Corporation in South Trenton, N. J.

J. H. DuFresne has resigned as auditor and assistant treasurer of the Pittsburgh County Railway, McAlester, Okla., to become auditor of the Minneapolis (Minn.) General Electric Company.

W. W. Foster, who has been secretary and treasurer of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., has been made general manager of the company to succeed M. C. Sauerwein.

William O. Morgan, who has been vice-president of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., has been elected president of the company to succeed C. Loomis Allen, of Allen & Peck, Inc.

Charles E. Elmquist has resigned from the Railroad & Warehouse Commission of Minnesota after nine years of service to become solicitor for the valuation bureau maintained at Washington by the National Association of Railway Commissioners.

F. W. Taylor, purchasing agent for the Pacific Electric Railway at Los Angeles, Cal., has accepted an appointment as purchasing agent for the Southern Pacific Company at San Francisco. He succeeds I. O. Rhoades, who resigned after ten years of service.

William Martin has resigned as auditor of the Illinois Traction System at Danville, Ill. Mr. Martin has not been active since last March, when he was stricken with mastoiditis and later with pneumonia. He will assume charge of the office of W. Lewis & Company, Champaign, Ill.

Frank R. Coates, president of the Toledo Railways & Light Company, Toledo, Ohio, was chairman of the committee for the Liberty Loan drive in Toledo. The committee under Mr. Coates raised about \$12,000,000 though the quota for Toledo was only \$10,000,000. At a concert given by Mischa Elman, the violinist, \$2,400,000 was raised among the audience.

Merle F. Gustin has been appointed division passenger and freight agent of the Union Traction Company of Indiana, with headquarters at Anderson, to succeed Alva E. Moore, resigned. Mr. Gustin entered the service of the company in June, 1909, as ticket stock clerk. He has since held the positions of clerk in the general manager's office, clerk in the storeroom and chief clerk to the engineer of maintenance of way.

Stuart H. Patterson has been elected comptroller of the Guaranty Trust Company, New York, N. Y. For the last three years Mr. Patterson has been vice-president and treasurer of the American Water Works & Electric Company, Inc., New York, N. Y., which controls the West Penn Railways, the West Penn Traction & Water Power Company and other companies. He was formerly connected with the firm of Patterson, Teele & Dennis, certified public accountants.

Gaylor M. Cameron, formerly master mechanic and superintendent of buildings New York State Railways, Rochester lines, has become special representative for the Gurney

Ball Bearing Company for Cleveland and vicinity. Mr. Cameron has had special experience in the use of ball bearings, his article in the *ELECTRIC RAILWAY JOURNAL* for Dec. 25, 1915, page 1263, being an example of his painstaking studies in that field. In addition to electric railway work Mr. Cameron will also handle other applications of the ball bearings. He was graduated from Ohio State University in 1904 with the degree of mechanical and electrical engineer. Soon afterward he entered the service of the Jeffrey Manufacturing Company, Columbus, Ohio. One year later he became connected with the Electric Controller & Supply Company, Cleveland. In 1906 he was appointed to the Cleveland Railway. In 1908 he became chief draftsman and engineer of buildings of the Rochester Railway, from which position he was advanced to master mechanic in 1910.

Dan G. Fisher will be appointed assistant to J. F. Strickland in charge of the publicity for the four so-called Strickland companies, the Dallas Power & Light Company, the Dallas Railway, the Texas Electric Railway and the Texas Power & Light Company. Mr. Fisher formerly held the position of personal representative of Mr. Strickland for the Texas Traction Company and the Southern Traction Company, now consolidated as the Texas Electric Railway with headquarters at Dallas in charge of publicity. He was at one time connected with the Dallas *Times-Herald*. His first railway experience was with the Santa Fé Railroad as assistant trainmaster and chief clerk to the division superintendent at Cleburne, Tex. Later he held a similar position with the Houston & Texas Central Railroad at Ennis, Tex. In 1908 he joined the staff of the J. F. Strickland Company and in 1912 was appointed assistant to R. B. Stichter, general manager. In January, 1914, Mr. Fisher was made assistant general manager of the Strickland lines. For several years he was secretary of the Southwestern Electrical & Gas Association and in 1914 was elected president of the association. He has recently returned to Dallas from a tour in which he visited many of the important electric railway systems in the East. Mr. Fisher was especially impressed with the work being done on the Bay State Street Railway along the lines of better public relations, and has announced that he will take unto himself the standard of that company for such relations as set down in the "Sermon on the Mount."

Obituary

Robert McLaren, St. Catharines, Ont., who built the first street railway in the vicinity of St. Catharines, died on Nov. 23. Mr. McLaren was eighty-one years old. He was also president of McLaren & Company, a large dry goods store in St. Catharines.

C. W. Batsell, former owner and operator of the local electric railway system in Sherman, Tex., now included in the system of the Texas Electric Railway, died at Brownsville, Tex., on Nov. 30. Mr. Batsell sold his holdings in Sherman and moved to Brownsville seven years ago.

Benjamin B. Davis, claim adjuster of the Columbus Railway, Light & Power Company, Columbus, Ohio, died on Nov. 21 at the home of his sister in Albany, N. Y. He had held this position since 1895. Early in his career Mr. Davis was connected with the claim department of the Philadelphia Rapid Transit Company. After this he was for some time in the government service at Washington and Baltimore. He had been secretary and treasurer of the American Electric Railway Claim Agents' Association since its organization in 1904.

Frank P. Smith, vice-president of the Interstate Public Service Company, died at his home near Franklin, Ind., on Nov. 28. He had been in his usual good health until Nov. 26, when he was stricken with apoplexy and never regained consciousness. Mr. Smith was born in Bartholomew County, near Columbus, Ind., in 1850, and for a number of years was engaged in business in Columbus. When the Indianapolis, Columbus & Southern Traction line was built by the late Joseph I. Irwin, Mr. Smith became vice-president of the company, and continued with the property when it was acquired by the Interstate Public Service Company. He is survived by his widow and two sons.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Gary & Valparaiso Railway, Gary, Ind.**—Incorporated to construct and operate an electric railway. Capital stock, \$10,000. Incorporators: William J. Henry, Edward H. Paine, Mearl T. Kitchen, John Polausky and Samuel J. Watson.

***Bethlehem (Pa.) Traction Company.**—Application for a charter has been made by the Bethlehem Traction Company to construct a line from South Bethlehem to Hellertown, 5 miles. Officers: Chester P. Ray, president; C. P. Ray, Jr., vice-president; L. M. Ray, treasurer, and Harry S. McDevitt, now Deputy State Auditor General, solicitor, all of Philadelphia. Edgar S. Gardner, president of the Middle City Bank, is interested.

FRANCHISES

St. Louis, Mo.—The Municipal Bridge Commission has granted permits to the St. Louis & East St. Louis Interurban Railway and the St. Louis & Illinois Railway to operate electric cars over the Free Bridge at St. Louis.

North Tonawanda, N. Y.—The Common Council of North Tonawanda has granted an extension of one year to the time in which the Frontier Electric Railway, owned by the International Railway, must begin construction of its line through the city. The proposed line will be for freight service between Buffalo and Niagara Falls, and will parallel the new fast service line of the International Railway. The Council also granted the request of the International Railway for an extension of one year within which the new Buffalo-Niagara Falls line must be completed through the city. Inability to obtain material was given as the reason for asking for the extension.

***Stayton, Ore.**—The City Council of Stayton has granted a franchise for the construction of a new railway in Stayton. An electric power right for a period of fifty years was also given at the same time. The proposed railway, it is said, will be operated by steam for a time, but later will be equipped for electrical operation. M. Lynott is interested in the project.

***Bethlehem, Pa.**—The Bethlehem Traction Company has asked the City Council of Bethlehem for a franchise to construct a line in Bethlehem. Chester L. Ray, Philadelphia, president.

Manitowoc, Wis.—The Wisconsin Public Service Company has accepted the provisions of the new franchise under which the company will be permitted to supply the city of Manitowoc with power.

TRACK AND ROADWAY

Alabama Interurban Corporation, Birmingham, Ala.—Announcement has been made that the Alabama Interurban Corporation is maturing plans for the construction of an electric railway from Gadsden and Mobile on the one end to Albany and Sheffield on the other. The plan provides, it is stated, for the Albany-Sheffield branch to extend through Jasper and connect with the Mobile-Gadsden branch at Greensboro. T. L. Cannon, president. [Nov. 17, '17.]

San Francisco, Napa & Calistoga Electric Railroad, Napa, Cal.—As a result of its rapidly growing freight service the San Francisco, Napa & Calistoga Electric Railroad has purchased 2½ acres of land in the first subdivision north of Vallejo, to be used in the operation of freight trains to and from the Napa Valley.

Municipal Railway, San Francisco, Cal.—In order that the municipal cars on Greenwich Street may reach the Baker Street entrance to the Presidio and go to the terminus of the system in the Presidio reservation, the public utilities

committee of the Board of Supervisors recommended the building of three additional blocks of tracks at a cost of approximately \$25,000. Only the small Union Street cars reach the Presidio at present. Owing to the traffic that has developed as a result of the war it is desired to run the heavy cars into the reservation.

Tidewater Southern Railway, Stockton, Cal.—This company is planning to complete its 10-mile extension to Livingston. It is also planned to electrify the line southward from Modesto.

***Kissimmee River Railroad, Kissimmee, Fla.**—This company has been organized with a capital stock of \$100,000, and proposes to construct a line from Walinwa to Polk County, about 7 miles. J. A. Griffin, president.

Atlanta & Anderson Electric Railway, Atlanta, Ga.—The Railroad Commission of Georgia has authorized the Atlanta & Anderson Railway to issue \$18,000,000 of securities, including \$6,000,000 each of common stock, preferred stock and first mortgage 5 per cent bonds, to fulfill its plans for the construction of an electric railway from Atlanta, Ga., to Anderson, S. C., about 140 miles. J. L. Murphy, Atlanta, president, is reported as saying that, while war conditions may delay the construction of the line, it is hoped to complete the road in two years. [July 7, '17.]

Evanston (Ill.) Railway.—From present indications objection by property owners in the western part of Evanston to an extension of the lines of the Evanston Railway is being removed and a route of about 3½ miles has been proposed. The route as planned extends on Howard Street, north on Asbury Avenue to Main Street, west on Main Street to Dewey Avenue, and north to Church Street, thence on Dell Avenue north to Simpson, over the Simpson Street bridge, north to Payne Street and west to the city limits.

Inter-Urban Railway, Des Moines, Iowa.—A report from the Inter-Urban Railway states that it is building 10 miles of second track between Des Moines and Camp Dodge and 13 miles of yards and sidings.

Wichita-Walnut Valley Interurban Railway, Wichita, Kan.—This company's proposed line has been surveyed from Wichita to El Dorado and from El Dorado to Rock, 12 miles north of Winfield. It is expected the road will be completed to Winfield some time next summer. Charles Payne, secretary. [Nov. 3, '17.]

Frankfort & Shelbyville Electric Traction Company, Shelbyville, Ky.—Bids will be received by the Frankfort & Shelbyville Traction Company and opened about Jan. 1 for the construction of its line from Frankfort to Shelbyville. The construction includes one reinforced concrete bridge of about 70-ft. span and two steel bridges of approximately 100-ft. span. P. C. Phillip, of the P. C. Phillip Engineering Corporation, Real Estate Trust Building, Philadelphia, Pa., is general manager. [Oct. 27, '17.]

Hagerstown & Frederick Railway, Frederick, Md.—Extensive improvements are under way by the Hagerstown & Frederick Railway which will result in standard-gage tracks on the Chambersburg, Greencastle & Waynesboro Railway, recently taken over by the Hagerstown & Frederick Railway, to conform with the tracks of that company.

Plymouth & Sandwich Street Railway, Plymouth, Mass.—It is reported that an extension will be built by the Plymouth & Sandwich Street Railway during the coming spring or summer from Sagamore Village along the northern side of Cape Cod Canal to Buzzards Bay Village, about 5 miles.

Southwest Missouri Railroad, Webb City, Mo.—Grading has been completed by the Southwest Missouri Railroad on its extension from Baxter Springs to Galena and work will be begun at once grading its proposed line from Baxter Springs to Picher.

Atlantic Coast Electric Railway Company, Asbury Park, N. J.—This company is building a 16-ft. bridge across Sunset Lake. There will be footpaths on either side of the trolley track.

Cape May, Delaware Bay & Sewell's Point Railroad, Cape May, N. J.—The Navy Department has taken over the Cape May, Delaware Bay & Sewell's Point Railroad, sold at receiver's sale last April to a junk dealer, and will rehabilitate the line.

Morris County Traction Company, Morristown, N. J.—An automatic block signal system is being installed by the Morris County Traction Company at Dover. The company will use a semaphore by day and a light system at night.

Public Service Railway, Newark, N. J.—Work has been begun by the Public Service Railway on the construction of a short trolley route from Camden to Clementon, touching Stratford, Laurel Springs, Haddon Heights and Collingswood.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The tracks and poles of the Trenton & Mercer County Traction Corporation are being removed on its extension from Yardville to Crosswicks. A decision was recently rendered by the court to the effect that the company could not be compelled to complete its roadbed and operate the line because of its failure to lay tracks across the line of the Pennsylvania Railroad at Yardville. About 2½ miles of track had been laid. Property owners on whose land the poles and wires were erected requested that they be removed. The rails will be used for repair work.

International Railway, Buffalo, N. Y.—A single-track line is being laid by the International Railway in Ohio Street, between Illinois Street and Main Street, so that Main Street cars can loop around the new Lackawanna Railroad passenger terminal at Main Street and the Buffalo River. Ohio Street has been relocated and as soon as the paving is completed the new route of the Main Street cars will be ready.

Piedmont & Northern Railway, Charlotte, N. C.—A contract has been awarded to the Porter & Boyd Construction Company by the Piedmont & Northern Railway to construct a 2-mile spur from Spartanburg to Camp Wadsworth.

Chillicothe Electric Railroad, Light & Power Company, Chillicothe, Ohio.—Survey has been begun for the proposed extension of this company's line from Paint Street through the City Park to Camp Sherman.

Cleveland (Ohio) Railway.—Work will be begun at once by the Cleveland Railway on the laying of tracks on the new high level bridge at Cleveland. The cost of laying the tracks has been estimated at \$250,000.

Ohio Electric Railway, Springfield, Ohio.—The tracks of the Columbus division of the Ohio Electric Railway will be relocated about 500 ft. south of the present tracks beginning just east of Harshmanville and ending near the Huffman farm, about 1 mile, preparatory to the construction of a dam by the Miami Conservancy District.

Altoona & Logan Valley Electric Railway, Altoona, Pa.—This company has completed the construction of its East Juniata extension as far as Fourteenth Street and operation of the line will soon be begun.

Dallas (Tex.) Southwestern Traction Company.—The contract for the erection of this company's bridge over the Trinity River at the foot of Commerce Street has been let to the Missouri Valley Construction Company. The contract calls for an expenditure of \$63,300, which does not include \$15,000 worth of materials to be used. The bridge will be 1300 ft. long and will be a replica of the present Commerce Street bridge. The piers of the new bridge will adjoin those of the Commerce Street structure on the north side. Work will be begun as soon as the company can get its materials and equipment on the ground. [Nov. 3, '17.]

Eastern Texas Traction Company, Houston, Tex.—The contract for surveying the proposed line of the Beaumont & Orange Traction Company between Houston, Beaumont and Orange has been awarded to L. S. Bryant, Beaumont. Part of the right-of-way for the line has been secured and preliminary work will be begun shortly. Ed Kennedy, Houston, president. [Oct. 27, '17.]

Puget Sound Traction, Light & Power Company, Seattle, Wash.—The City Council of Seattle has passed a bill authorizing the institution of condemnation proceedings for the acquirement of land for a street railway approach from the west end of the Spokane Street bridge. The entire cost of the proceedings will be borne by the Puget Sound

Traction, Light & Power Company, the right-of-way to be used for street car purposes until such a time as a permanent bridge at Spokane Street proper is constructed.

Seattle (Wash.) Municipal Railway.—A bill has been introduced in the City Council whereby the proposed Market Street line instead of terminating at Market and Leary Streets will be built west to Sixty-seventh Street and Twenty-third Avenue Northwest to intersect with the Loyal Heights line, to which it is proposed to transfer. J. J. Wettrick, chief engineer of the Department of Public Utilities, states that the construction of the Fifteenth Avenue N. W. bridge and the laying of rails on the several approaches will be completed two or three weeks before the rest of the work. In addition to the extension north of the bridge 300 or 400 ft. of track will have to be laid from the present terminus of the city line at Thirteenth Avenue West and Nickerson Street to the bridge approach. North of the bridge as far as Market and Leary Streets the roadbed has been excavated, part of the ballasting laid and all of the ties placed. The laying of rails and erection of the trolley is yet to be done the entire length of the line.

Tacoma (Wash.) Municipal Railway.—The City Council of Tacoma has voted to extend the municipal car line from the present terminus at Eleventh Street and Taylor Way to Lincoln Avenue, a distance of about 1 mile. The extension will cost about \$20,000.

Norfolk & Western Railway, Bluefield, W. Va.—It is reported that the Simmons branch of the Norfolk & Western Railway has been electrified and is now being operated by electricity.

SHOPS AND BUILDINGS

Greeley & Denver Railroad, Greeley, Col.—The carhouse of the Greeley & Denver Railroad, which also included the substation, office, storeroom and blacksmith shop of the company, was totally destroyed by fire on Nov. 23. Three cars which were in the building and the substation equipment were destroyed.

Ohio Electric Railway, Springfield, Ohio.—A new freight station will be built by the Ohio Electric Railway at Grand Avenue and the Cincinnati, Hamilton & Dayton Railroad tracks. The cost of the building is estimated at about \$20,000.

POWER HOUSES AND SUBSTATIONS

Lake Shore Electric Railway, Cleveland, Ohio.—Approval has been given by the Public Utilities Commission of Ohio to the application of the American Gas & Electric Company and the Lake Shore Electric Railway to purchase the hydroelectric plant of the Ohio State Power Company for \$120,000, located on the Sandusky River. The plant is to be used because of the current shortage of coal.

Northwestern Ohio Railway & Power Company, Toledo, Ohio.—A new transmission line will be built by the Northwestern Ohio Railway & Power Company from Danbury Stop to Danbury, 1½ miles, to supply the large pumping station of the New York Central Railroad with power. The company will also install an additional transformer at its station. The New York Central Railroad will pay the entire cost of building the 1½ miles of line and the cost of a third wire from Danbury Stop to Danbury, and will also pay one-half the cost of the transformer.

Conestoga Traction Company, Lancaster, Pa.—Extensions and improvements are being contemplated by the Conestoga Traction Company to its Engleside power house, to cost about \$100,000. The plans provide for the installation of considerable electrical equipment.

Lynchburg Traction & Light Company, Lynchburg, Va.—The installation of an underground distribution system in Lynchburg has been begun by the Lynchburg Traction & Light Company, and it is expected that the lines will be completed by Jan. 1, 1918.

Wisconsin Traction, Light, Heat & Power Company, Appleton, Wis.—An addition has just been completed by the Wisconsin Traction, Light, Heat & Power Company to its power station at Brighton Beach, which nearly doubles the size of the station.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent
 Rolling Stock Purchases Market Quotations Business Announcements

Rolling Stock Deliveries in Unsatisfactory Condition

Car Builders Handicapped by Material Supply, Labor and Other Conditions Over Which They Can Exercise No Control

As a concrete example of factory congestion, deferred shipments and lame deliveries, of which general complaint is heard in all lines of business, the delays incident to the building of rolling stock may be mentioned. Though the electric roads have not been such liberal buyers of new cars and equipment as in former years, at the same time the orders placed within the past year or so have not been negligible. They have come not only from railways serving cantonments, training camps and military and naval bases, but orders for new cars made necessary by increases in traffic have been quite general in all parts of the country.

The pressure to have these orders filled no doubt has been and is yet insistent, but apparently no marked headway is discernible. Even the Priority Board expediting certificate is either futile or has not been forthcoming. It is well known that the car builders have been handicapped by the lack of materials to meet specifications and that it is not improbable that orders are being sidetracked due to circumstances over which the manufacturers have no control. Allowing for all shortcomings at the car-building plants—and they are abnormal, as may be expected—the difficulty of meeting promptly the demands of the railways appears at present to be insurmountable. As instances of these deferred deliveries, which seem to be accepted in a most commendable if not altogether patient spirit, may be quoted that of an Ohio electric road that placed an order for twelve 52-ft. steel interurban cars and five steel cars for city service in February. Of the lot two were delivered a week ago.

Early in May a Tennessee traction company filed specifications for twelve double-truck cars with one of the largest and best-equipped manufacturers in the country. Under the contract they were to be delivered by Sept. 1. Up to this writing not a car has been shipped. The railway was notified that "completion of the order cannot be definitely set on account of war conditions and stringency," and delivery was not possible until March next. Subsequently the manufacturers stated they could not set a definite time of shipment, and if the traction company wished to take steps to expedite the arrival of the much-needed rolling stock they would cancel the contract. Now the road expects to receive the cars by next summer.

One other Southern company placed an order, about the middle of May, for twenty-three pay-as-you-enter cars, and, notwithstanding the contract specified delivery date, it will receive only a partial shipment about the first of the year. They have been en route since the middle of November, reports state, but the freight embargoes are holding them up. The balance of the order, it is expected, will follow in three months. Many other instances of this kind could be cited, but these suffice. The trouble in obtaining equipment and special parts and lack of material and war pressure and other obstacles of a reasonable nature, particularly labor, such as many manufacturers cannot readily or quickly overcome, are offered in explanation. It only emphasizes the troublesome but unavoidable fact, however, that car builders are subject to the same annoyances that nearly every other manufacturer in the country is experiencing at the present trying period. Under the circumstances, it is held anticipating requirements would hardly apply.

Market for Railway Freight Cars Looking Up

Congested Condition of Steam Roads with Unprecedented Transportation Requirements Send Many Electric Roads Into Market for Rolling Stock

With the existing congestion of freight on the steam railroads shippers in a number of sections are looking toward the electric railways for relief, if it can be provided. This new development may have an important and far-reaching effect on the freight business of the traction lines. Up to this time, with a few notable exceptions, the freight business of the electric lines has been largely in package transportation. Now, real freight haulage is contemplated.

Roads which are planning to purchase freight cars for this purpose must realize that at present such cars are hard to get even from builders with large plants, whose activities just now, besides being somewhat absorbed on government work or war material of one kind or another, are being impeded by the difficulty of obtaining materials and labor. Hence, unless an order is of considerable size, or it is given a priority preference, so as to obtain the steel, it is declined unless it is taken with "shipment at convenience of factory." This situation will undoubtedly cause a demand for second-hand cars as well as increase the number of freight cars manufactured in company shops. One company on the Pacific Coast has already started the manufacture of 100 box cars.

Discussing this new development, the sales agent of a company making standard and special equipments recently remarked that it not only opened up a new field for the railways but also created a large outlet for the appliance manufacturers and distributors. They would not only be called upon to supply equipment and appliances for the new cars but for revamping and reconstructing much of the existing freight car equipment. If longer trains are to be run, there should also be orders for electric locomotives as a result of this campaign for greater freight transportation.

Foreign Competition Here After the War

Possibility That Engineer Soldiers, Besides Bringing Back New Ideas on Foreign Goods, May Have Agencies for Them

When this war is over, according to statements by authorities on the broader phases of manufacturing, foreign competition in the electrical field will be stiffer than any we have ever known. They base their conclusions on two facts. The United States has made foreign alliances. These obligations carry with them not only military but commercial understandings. When peace comes we will not tolerate our allies setting up tariff barriers against us and we will not expect to set them up against our allies. The belief exists that the tariff wall which kept the products of cheap foreign labor out of this country will have completely crumbled. Besides this, our engineer soldiers now abroad are not required to give their entire time to defeating Germany. They visit England, France, Italy and other countries on furloughs. In their leisure moments they visit things that interest them—engineering projects, power plants and the like. There is therefore the possibility that when they get ready to return to the United States some of them will bring along agencies for these foreign goods. Certainly they will bring new ideas regarding the applicability of foreign goods to American

problems. Naturally the United States will then cease to be a secluded country. It will become a world nation engaged in world trade.

There is now plenty of time, it is believed, to prepare for what is coming. And it is not expected that industrial America will be found unprepared. Costs are being studied not only in the factories, but in the distributing forces. More efficient methods of production and distribution are at hand. In fact, when industry returns to the manufacture of purely peaceful products there will be available such increased manufacturing facilities that quantity production at correspondingly low prices is expected to result.

Better Plan Early for Next Year

President of Important Property Recommends Making Up Budget Now Rather than in January or February

The president of a large Middle-West electric railway property recently directed his department heads to "buy all the materials and supplies you can get for your next year's work now." This might perhaps well be made the text of similar instructions to department heads of electric railway properties generally, for there is no indication that the supply of materials will be any more plentiful next year than now, in view of the constantly increasing demand for them on the part of the government. Such procedure should not contemplate hoarding, but if there is "must" work to be done next spring and summer, it will be the early bird in the market who is able to take care of this necessary work as planned.

Prices are becoming more and more stabilized through the influence of governmental price fixing, so that there is not great likelihood of future marked increase in costs. On the other hand, the extraordinary demand at present and the very remote probability of a slackening in the demand during the next year would seem to give little basis for anticipating any reduction in prices. For these reasons, the prices will have little bearing on the time of placing orders. Hence, the sooner now that orders are placed, the more probable will be the delivery by the time the supplies are needed.

There has been a tendency on many properties in the past not to make up the annual budget and construction plans until in January and even February. Under normal market conditions this is probably sufficiently early, but this year it seems especially important that inquiries for the contemplated supplies should be sent out as soon now as is possible, and that the information thus gleaned should be made the basis of the budget and the latter then completed and orders placed at the earliest possible moment. Such a program will have the effect of advising the manufacturers earlier of the needs of the industry, and thus give them a longer time before deliveries are required, in which to secure the necessary raw materials—a task of no mean proportions. A few of the railways have already sensed this condition and have been sending out inquiries during the last few weeks. The practice could well be adopted generally.

Market for Measuring Devices Broadening

Policy of Finding Out How to Make Existing Equipment Do Increased Work Instead of Buying More Creates Demand

Shortage of capital, the uncertainty of deliveries and high prices are responsible for broadening the market for measuring devices of many kinds. Every effort is being made to make apparatus on hand suffice. Repairs are going on to an extent far beyond that of normal times. Apparatus is shifted to meet conditions where formerly additional equipment would be purchased. In order to make sure, therefore, that the repairs have been well made and that the new disposition of apparatus will work, recording instruments become necessary. The demand consequently for portable instruments, such as instrument transformers, millivoltmeters, ammeters, etc., has increased considerably of late.

Wire Buying by Traction Companies Is Weak

Base Quotations Higher than Government Copper Price Would Represent Because Manufacturers Must Pay More for Stock for Private Orders

Traction companies are buying wire as everything else on the "hand to mouth" basis, and then paring the order down to the lowest possible quantity. On weatherproof and insulated wire the market is equally unsatisfactory to buyers, so much so, in fact, that the buying, for the last week or ten days especially, is down to about the irreducible minimum, according to the reports from influential sellers. The Philadelphia Rapid Transit Company recently placed a large order for cable, and it was promptly filled and delivered, on account of its being given priority for government use.

Jobbers' quotations on Monday of this week for weatherproof in large quantities was in the neighborhood of 35 cents per pound in the East and around 39 cents in the Middle West. There is a slight confusion in the quotations on wire base, ranging from 30 to 34 cents and even reaching 39 cents, but no transactions of any magnitude are reported.

Prices for wire are not as low as the government price of 23½ cents for ingot copper would represent. Wire base is 3 cents or more higher. The reason, however, is that manufacturers have not been able to buy 23½ cent copper for other than government work. Prices paid to-day for new copper for private orders are above the 26-cent mark.

Conditions in the Railway Iron and Steel Market

Reduction in Iron Pipe Not Reflected in the Price of Trolley Poles—Car Wheels Are Lower

Market conditions on every species of railway material of which steel or iron forms a part have not changed, excepting along more rigid lines. On many goods prices are not quoted unless official advices from the factory are first obtained. The rule appears to be change without notice, and in the sea-board territory no guarantee of freight delivery. The latter rule is growing more stringent.

A slight reduction in iron pipe, announced recently, becoming effective at once, in nowise affected the selling figures on overhead or street trolley poles or their equipment. Gears and pinions needed as auxiliary to the turning out of war material are being shipped promptly; but the private consumer is obliged to wait the convenience of the factories. Car wheels have dropped in cost with the loosening up of the government price on pig iron. The demand is stated as normal, but the trouble appears to be a shortage in old wheels, which are difficult to get anywhere. Deliveries are not behind because shipments are certified as essentials by the priority committee of the War Industries Board, a proceeding which takes about a week to push through.

ROLLING STOCK

Pacific Electric Railway, Los Angeles, Cal., expects to build 100 box cars during the coming year.

Greeley & Denver Railroad, Greeley, Col., lost three cars in a fire on Nov. 23 which destroyed its carhouse.

Inter-Urban Railway, Des Moines, Ia., expects to purchase one or two 60-ton electric locomotives during 1918.

Winona Interurban Railway, Warsaw, Ind., contemplates the purchase of some freight trail cars during 1918.

Massachusetts Northeastern Street Railway, Haverhill, Mass., is remodeling four open cars into closed cars in its shops.

Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va., expects to construct and equip one 40-ton locomotive during 1918.

Princeton Power Company, Princeton, W. Va., reports that it will probably purchase during the year 1918 two closed trail cars for use on the interurban line between Princeton and Bluefield, W. Va.

Buffalo & Depew Railway, Buffalo, N. Y., expects to purchase ten or twelve additional cars for carrying employees to the ammunition factories at Depew.

Gray's Harbor Railway & Light Company, Aberdeen, Wash., has ordered six one-man cars from the American Car Company. The company contemplates changing its single-truck cars during 1918 for one-man operation.

Lake Erie, Bowling Green & Napoleon Railway, Fostoria, Ohio, has ordered a 40-ft. combination baggage and snow plow car of a novel type. Instead of a plow at each end as is usual, it has a plow attachment on one side and a scraper on the other. The car, ordered in the spring, is just now being delivered.

TRADE NOTES

Locke Insulator Manufacturing Company has changed its address from Victor to Rochester, N. Y.

Blaw-Knox Company, Pittsburgh, Pa., held its annual salesmen's convention in that city on Nov. 22, 23 and 24.

Electric Storage Battery Company, Philadelphia, Pa., has opened new offices in Detroit, Mich., at 1158 Cass Avenue.

Lloyd P. Jones, recently made vice-president and general manager of the Federal Brass Works, Detroit, was formerly sales manager.

Weston Electrical Instrument Company, Newark, N. J., has increased its capital stock by the issue of 5000 new shares of common stock to \$1,500,000.

General Electric Company, Newark, N. J., has acquired property opposite its present plant, from Boyd to Lillie Street, and is said to be planning for plant extensions.

C. G. Young has become associated with Ford, Bacon & Davis, 115 Broadway, New York, N. Y., giving up his offices at 14 Wall Street on Dec. 1. He will be engaged particularly on reports and appraisal of public utility and industrial plants.

Joseph McKay, Jr., for thirteen years with the Wheeler Condenser & Engineering Company, and for the last two years with the Pittsburgh Valve, Foundry & Construction Company, has recently been engaged as general sales manager of the Descharrel Engineering Corporation, New York City.

Railway & Power Engineering Corporation, Toronto, Ont., Canada., has been chartered by Theodore Malm, 55 Kingswood Road; Gerard Ruel, 127 Isabella Street; Frederick C. Allen and others. The company is capitalized at \$50,000 and proposes to manufacture machinery, tools, etc.

Philadelphia Storage Battery Company, Philadelphia, has opened a branch office and depot at 37 Spear Street, San Francisco, Cal. The company's first Pacific Coast branch was opened in Los Angeles a year ago. Arthur Affeld will have charge of the Los Angeles office and A. P. Clark will operate the San Francisco office. C. L. McWhorter, manager of the Pacific Coast division, will make his headquarters at the San Francisco office.

Connecticut Brass & Manufacturing Corporation, Waterbury, Conn., has been organized to acquire and consolidate the business of the Connecticut Brass Corporation of West Cheshire and the Pilling Brass Company, Waterbury. It will be the largest concern of its kind in the country. The production of the constituent companies in twelve months has increased 1000 per cent. The prospectus of the new corporation has just been distributed.

National Railway Appliance Company, New York, N. Y., on Thursday received nine Johnson fare boxes by express from the Johnson Fare Box Company, Chicago, Ill., to be installed immediately on Brooklyn stations of the New York Municipal Railway Corporation. The latter title is that of the subway system operated and controlled by the Brooklyn (N. Y.) Rapid Transit Company. The boxes, to expedite delivery, were forwarded from Chicago Tuesday, by express, but at Pittsburgh, Pa., they were unloaded for the accommodation of a governmental shipment coming to an Atlantic port. They were then reloaded and went to Boston, and but for the retention of the car number by the consignee, possibly might have gone astray. However, the boxes reached New York, and the express bill was an even \$100. The consignee, while gratified to receive the shipment—a rush order—dryly observed it was some bill.

NEW ADVERTISING LITERATURE

Worthington Pump & Machinery Corporation, New York, N. Y.: A bulletin descriptive of its Deane automatic pumps and receivers, steam, electric, single, duplex and triplex types.

Nuttall Company, Pittsburgh, Pa.: An illustrated bulletin descriptive of its industrial products. This book includes information on gears, expansion joints, flexible couplings and trolleys.

Ophüls-Hill & McCreery, Inc., New York, N. Y.: Data book for securing all data pertaining to plants and the operating conditions to make estimates on contemplated improvements.

Ampudia & Cahill, New York, N. Y.: An illustrated leaflet descriptive of a cable-winding machine. This machine does the winding on the ends of cables in the form required by both United States standards and foreign standards for aeroplane work.

E. I. du Pont de Nemours & Company, Wilmington, Del.: Another "Du Pont Products" book has just been published by the company and its associates, Du Pont Fabrikoid Company, Du Pont Chemical Works, the Arlington Works and Harrisons, Inc. It lists all the products of these concerns and describes their uses as well as who uses them. A new "Products" book will hereafter be distributed at least once a year.

Standard Underground Cable Company, Pittsburgh, Pa.: A revised bulletin on type D. O. A. outdoor cable terminals in which several new types of terminals are described and listed. Among these are the protected disconnection terminal, pipe-top terminal and bore-hole terminal. The bulletin gives tables of working voltages and sizes of conductors for which terminals of certain dimensions and weights are required; also instructions for ordering, installing, etc.

Borden Company, Warren, Ohio: Published 1918 catalog of "Beaver" die stocks and square-end pipe cutters. This catalog is said to be the finest tool catalog ever issued, and its attractive appearance indicates that no expense has been spared in securing the services of the best artists and printers. Several new "Beaver" tools are shown for the first time in this catalog—one of the most popular of these being the No. 3 "Beaver" junior ratchet die stock, which is built on the unit plan to thread pipe from 1/8 in. to 1 in.

NEW YORK METAL MARKET PRICES

	Nov. 28	Dec. 5
Prime Lake, cents per lb.	23 1/2	23 1/2
Electrolytic, cents per lb.	23 1/2	23 1/2
Copper wire base, cents per lb.	30	29
Lead, cents per lb.	6 1/2	6 1/2
Nickel, cents per lb.	50	50
Spelter, cents per lb.	7.97 1/2	8.00
Tin, Straits, cents per lb.	80	85
Aluminum, 98 to 99 per cent, cents per lb.	36	36

OLD METAL PRICES—NEW YORK

	Nov. 28	Dec. 5
Heavy copper, cents per lb.	22	22
Light copper, cents per lb.	19 1/2	19 1/2
Red brass, cents per lb.	17 1/2	17 1/2
Yellow brass, cents per lb.	14 1/2	14 1/2
Lead, heavy, cents per lb.	5 1/2	5 1/2
Zinc, cents per lb.	5 3/4	5 3/4
Steel car axles, Chicago, per net ton.	\$42.00	\$42.00
Old carwheels, Chicago, per gross ton.	\$31.00	\$31.00
Steel rails (scrap), Chicago, per gross ton.	\$34.50	\$34.50
Steel rails (relaying), Chicago, per gross ton.	\$55.00	\$55.00
Machine shop turnings, Chicago, per net ton.	\$17.00	\$17.50

RAILWAY MATERIALS

	Nov. 28	Dec. 5
Rubber-covered wire base, New York, cents per lb.	34	34
Rails, heavy, Bessemer, Pittsburgh.	\$38.00	\$38.00
Rails, heavy, O. H. Pittsburgh, per gross ton.	\$40.00	\$40.00
Wire nails, Pittsburgh, per 100 lb.	\$2.50	\$4.00
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	\$5.50	\$5.50
Steel bars, Pittsburgh, per 100 lb.	\$5.00	\$5.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	\$5.80	\$5.80
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	\$4.85	\$4.85
Galvanized barbed wire, Pittsburgh, cents per lb.	\$4.35	\$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	\$2.50	\$2.50
Cement (carload lots), New York, per bbl.	\$2.22	\$2.22
Cement (carload lots), Chicago, per bbl.	\$2.31	\$2.31
Cement (carload lots), Seattle, per bbl.	\$2.65	\$2.65
Linseed oil (raw, 5 bbl. lots), New York, per gal.	\$1.20	\$1.21
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	\$1.23	\$1.22
White lead (100 lb. keg), New York, cents per gal.	10	11
Turpentine (bbl. lots), New York, cents per gal.	51	50 1/2