

# Electric Railway Journal

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## This, if It Exists, Is a Baseless Fear

**E**LECTRIC railway equipment and operation are not perfect, and never will be for that matter. Improvement is always possible and ought to be, for the general good. And the best way to improve is to discuss shortcomings and methods of removing them. In some quarters there seems to exist a fear that if the electric railway's limitations are "aired" and discussed, such discussion will act as a boomerang when justice at the hands of the public is requested. In other words, the idea is that the commissions will refuse the boon of higher fares and relief from unjust burdens until the railways can show that their operation is perfect and their managers are altogether omniscient. Now the whole theory of regulation is based upon the supposition that the commissions know all of the facts, pro and con. If they do not get the operating limitations of the electric railways from the latter, who understand these limitations, they will get the information in roundabout ways, and possibly in distorted form. Any suggestion that is constructive and practical should be freely and openly discussed, as also should every advance in electric railway design, construction and operation.

## Why Water Power Is Not More Extensively Used in This Country

**I**N THESE strenuous days of fuel shortage the problem of effectively using our enormous water-power resources naturally becomes more than usually a live one. The perennial nature of this power makes it especially attractive because we all realize that, once exhausted, our coal and oil resources can never be replaced. Viewed in the abstract it would appear to be only ordinary common-sense to use the water and make the coal and oil last as long as possible. In the concrete, however, this does not work out as an economic possibility, certainly not under present restrictions as to the use of government-controlled water powers.

Some water power is used in supplying electric energy on electric railways, from 10 to 15 per cent of the total generating capacity being in water turbines. Electric railway companies also purchase water-generated energy to a considerable extent. Railway managers should therefore be familiar with the technical and statutory limitations which handicap water power in competition with steam. These are clearly set forth in a report just presented by Calvert Townley, as the representative of the Engineering Council, to the United States Chamber of Commerce, and abstracted in the present issue of the JOURNAL.

The fact is that, considering the inherent inferiority of water power, the great cost of utilizing it (including the necessary provision of a steam reserve), and the

remarkable advances made in the art of producing energy from steam, the latter is in general the cheaper power. No unnecessary restrictions should, therefore, be permitted to hamper the application of water power in such fields as are open to it. Mr. Townley's report, while condensed, is an admirable and readable presentation of a vital subject which is ordinarily enshrouded in verbiage or fenced in with technical formulas.

## Five Cents No Longer Pays for Chicago Elevated Ride

**T**HE first mention in Chicago of a plan to appeal to the State utilities commission for additional revenue for the elevated roads has stirred up a whirlwind of opposition. The people of the country's second largest city have not yet awakened to the fact that times have changed and that other state commissions have been trying to put public utilities on a paying basis. President Budd of the Elevated says in a public statement: "You have grown so accustomed to being carried all over town for a nickel that you never gave a thought to whether you were being carried for less than cost."

This is a rude awakening for Chicago's 2,500,000 people. They have become used to advanced prices on everything else. They know the nickel is not as big as it used to be for purchasing any commodity or even for steam road travel. But they have been raised on a bottle labeled "One city—One fare—Five cents," and they believe their growth will be stunted if that label is changed. That same bottle was used in 1860 when the first car lines were built and the city's area was only 20 square miles. It is still being used when the city has developed into an infant spread over 200 square miles. These people have heard with pride from an expert traction commission that the average length of journey is greater than that of other cities. They boast that it is possible to ride some twenty miles on the elevated or thirty-three miles on the surface lines for a nickel with transfers. What a shock therefore to be told that they have been getting more than their money's worth!

Action on the proposed petition of the elevated roads will be awaited with interest. The Illinois State commission will have a chance to show whether it measures up to the standard of other state bodies which have acted without fear of popular clamor. Already the Illinois commissioners have given limited relief to certain roads, but it remains to be seen whether the "one city—one fare" fetish is held too sacred to be broken in the case of Chicago. The elevated roads are in a different position from the surface lines. They are organized under the "steam road act," which does not have a twenty-year limit for franchises. The surface



lines have ordinances which expire in 1927. Both surface and elevated roads have offered to surrender their present franchises on a basis which will permit of their consolidation.

The proposed plan involves a "new deal" with a protected rate of return in accordance with the principles of modern partnership agreements. However, the working out of a settlement on this basis is still remote, and in the meantime it is not surprising that President Budd has given notice that some relief must be had at once if the people are to have efficient service and the stockholders are to receive a return on their investment which they have not been able to obtain for some years.

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### The Cities Desire Regulation by Confiscation

THE politicians in charge of the affairs of the municipalities in the State of New York have boasted that they would not abide by the decisions of the Second District Public Service Commission in the 6-cent fare cases, but would undertake political reprisals. The first step in this direction is the introduction in the Senate of two bills which would work a radical revision in the public service commission law. In these, Senator G. F. Thompson revives the old proposal to have only one commission for the State, but he has added the provision that the chairman shall be elected by popular vote. The animosity of the associated city attorneys is thus clearly evident. The cities want a commission that will fix rates regardless of justice and reasonableness. They desire a presiding officer who will consider the political consequences of his every utterance rather than enforce the law as he finds it.

The worst feature of Senator Thompson's bill, however, concerns the proposed restriction of the rate-making power of the commission. The law which he proposes would contain these retrogressive clauses: "Nothing in this chapter contained shall be deemed to permit the commission or any court to increase any rate which has been heretofore, or may be hereafter, authorized by statute; nor shall anything in this chapter contained be construed to permit the commission, or any court, to make a determination or decision that the rates established in, or as the consideration for, the grant to any public service company of any charter, franchise or privilege are unjust, unreasonable, unjustly discriminatory or unduly preferential."

Such legislation would be expected from a Bolshevik party intent upon the destruction of property. The certainty that the right of the courts to examine statutory rates for confiscatory features cannot be impaired; the fact that rates fixed by franchises make no allowance for future development, or even existence under increasing burdens; the fact that the proposed law would mean a total paralysis of utilities—these are matters of no concern to the cities' representatives.

The passage of such a bill would mean a decade or more of poor service in the State of New York. It is hardly conceivable that the people will sit quiet while false friends inflict such an incalculable injury upon them. It is the duty of every public-spirited citizen to be alert to block such legislation and to disseminate as widely as possible information concerning the lamentable shortsightedness of such proposals.

### A Reaction in Electric Railway Affairs Is Due Soon

SOME diagrams of the present economic status of the electric railway, printed elsewhere in this issue, might discourage even those inclined to be most optimistic if considered, without reference to the wider outlook, as reflecting a permanent condition. No doubt the industry is having "hard sledding" during these war days in which many industries are prospering hugely. No doubt, again, it is almost impossible to get new money for necessary improvements and to earn money enough to keep property in repair. But granting that the business is essentially sound, and that a vital service is supplied by the electric railway, there is just cause for an expectation of a turn in the tide.

There is a law of nature which requires that every force shall produce a reaction. For example, we start a car, and its inertia imposes a reactive force which requires power to overcome. The same inertia is the cause of resistance to stopping when the brakes are applied. The present low ebb in electric railway affairs, aside from the transient effect of the war, is due to two things. First, the public has expected too much in return for what it has been willing to allow. Second, railway transportation is not up with the times.

The reaction against the present conditions will correspondingly appear, it is in fact already beginning to appear, in two ways. On one hand burdens will be lightened and fare limits raised; on the other the lessons taught by the jitney and the private automobile will be applied in the furnishing of better transportation. The men who are laboring intelligently to bring about these changed conditions see a bright future for the industry. The pessimists are those who either are doing nothing constructive, or have failed to look at the matter in a large way.

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### Philadelphia Lease Lays Good Basis for Future

PERHAPS Philadelphia is slow. Sometimes, however, slowness is simply the result of deliberation, of hunting for the right, of trying to use all the foresight possible. That seems to be the case in connection with the new rapid transit agreement, just approved by Councils, signed by the Mayor and now awaiting the signature of the Philadelphia Rapid Transit Company. After a long period an unusually flexible plan has been evolved for unified operation of city and company lines.

The foresight shown in preparing the lease is evident from a glance at the underlying principles. These are that such unified service as the people desire should be furnished at minimum cost; that the cost of that service should be supplied by the users, and that the authority of the Public Service Commission to regulate service and fares should be fully recognized. To put it another way, the fundamental idea is to secure and maintain the desired service, and to make the fare fit the service. Philadelphia thus desires to avoid the economic error, prevalent in the past, of imposing burdens which may later become unbearable under fixed fare and operating regulations. The Philadelphia lease is in accord with modern ideas and the joint interests of all parties in transportation development.



The lease provides, of course, for ultimate recapture if the city so desires. Other detailed provisions also deserve mention. The use of a Supervising Board is not novel, but it is rather unusual to have its place in the general regulatory scheme defined with such an exact recognition of the larger interests involved. This board, for example, will have no power to alter, postpone or delay the building or operation of any line desired by Councils. Furthermore, it must not usurp any power vested in the Public Service Commission. It is expected that matters relative to maintenance and service will be heard more expeditiously by the board than by original application to the commission, but appeals can be made to the latter body or applications made directly to it on matters where it has jurisdiction. This seems a proper definition of powers for a local body of experts under state regulation.

In regard to the flexible fare and the position of the return to the company the Philadelphia lease makes a marked departure from preceding partnership agreements. The basic ideas of the others have been the maintenance of a 5-cent fare, the protection of the return on the company's old investment by means of preferentials, and the meeting of deficits in the city's return by taxation. This question of the division of the financial risk was debated long in Philadelphia. In December, 1916, the company submitted a proposal for a guaranteed 5 per cent return on its stock with a further share in surplus earnings, all future risks being substantially assumed by the city. In the following August representatives of the city and the company reached an agreement under which the company assumed the risks, its return being dependent upon action by the Public Service Commission as to rates of fare. The city representatives agreed that a dividend of 4 per cent would be reasonable, and that the city would join with the company in an appeal for a fare increase if the rate of return on stock fell below this percentage. Under the present lease, however, the business risk is shared alike by the city and the company (*i. e.*, in proportion to their investments), and the latter's dividend is limited to 5 per cent.

This division of risk, of course, is permissible only because of the protection afforded to the company's return by the adjustable fare. Under a carefully worked-out plan, the Supervising Board must under certain conditions file a new schedule of "fares and charges" with the Public Service Commission. Although the lease is not explicit on the point, we assume that such terminology would permit a zone system if this were desired. While it is stipulated that the rates must always be sufficient to meet the requirements of the lease, the final approval is left where it belongs—with the commission. Whether the rates are revised upward or downward, however, the city must share the results equally with the company. Thus, although the equal division of the business risk is a novel provision, it seems to be so arranged for as to insure co-operation between city and company in securing rate adjustments.

While, as stated above, the lease contemplates that the car-rider will pay for the service, the future of this point is not fixed. A definite provision is inserted to enable the municipality at its option to reduce the fare requirements by relinquishing, to the amount and the length of time desired, the rental for the city-owned high-speed lines. This again is a clause written for

the future. Preceding partnership agreements have generally recognized that rapid-transit development is a civic improvement that is bound to result in early years in deficits which the taxpayer and not the car-rider should pay. The Philadelphia negotiations have begun with the assumption that the car-rider will be able, perhaps with fare adjustments, to carry the burden. If not, the way to overcome the difficulty is open. Only the future can determine what the taxpayer will be called upon to meet. The experiment, however, will be useful in giving some indication of what the car-rider is capable of financing.

The prime requisite of a good partnership agreement is that it shall be fair in abnormal as well as normal times. This the Philadelphia lease seems to have secured. Over a long period of time—until 1957—it permits a reasonable adjustment of service and fare, and a comprehensive transit development. It represents a great advance in constructive and far-visionsed franchise drafting.

### A Rail-Wear Test of Unexpectedly Long Duration

THERE seems to be an increasing sentiment among many engineers in favor of adopting the tram girder rail under certain circumstances when the uses of the preferred T-rail is not permitted. The subject has been under discussion in these columns for some weeks past and is still open for discussion. As a result of the discussion to date we suggest that the Engineering Association committees on way matters and standards consider the inclusion of a tram rail section among the standards when next the *Engineering Manual* is revised.

The fact that under changed conditions of street traffic the tram rail is coming back into its own renders even more interesting than it otherwise would be the article on "An Experimental Study of Rail Wear" which R. C. Cram has prepared for this issue of the *JOURNAL*. The rails covered by this study were tram rails. They were laid more than twenty years ago, and still have some life in them in spite of the fact that nearly 10,000,000 car wheels have passed over them. It is not often that engineers have opportunity to continue a test for more than two decades. The circumstances which made such a long test possible in this case were accidental, but by following up such clues as remained Mr. Cram was able to make at least partial scientific use of them. By so doing he has considerably increased the value of A. J. Moxham's famous A. S. R. A. paper on "Rails—Their Construction from a Scientific Standpoint," read in 1898.

When Mr. Moxham read his paper nearly twenty years ago he believed that the life of rail was determined by the joints. At that date the welded joint was new and joint design generally was in a primitive state. Since then much progress has been made in mechanical as well as welded joints, and this progress still continues. In fact, there has never been a time when the importance of keeping the track in the best possible repair was so keenly appreciated as now, when it is almost impossible to buy new rails and the old must be made to do. Broadly speaking, then, it can hardly be said in these days that rail life is determined by the joints, providing suitable joints are employed.



# An Early Experimental Study of Rail Wear

First Use of Electric Weld Joints—Original Experiment Brought Down to Date—Abstract of Paper on Original Study on This Subject

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THE subject of rail wear and its relation to the composition of the steel in the rail has had considerable attention in the last few years, partly through the discussion which has led to the general adoption of high carbon open-hearth steel for rails and standard specifications therefor, and partly through the study of rail designs by the American Electric Railway Engineering Association. Added interest has also been created through the study of corrugation and curved-head rail design. All this recent attention to the subject of rails has led us to the belief that the study of rails and rail wear, at least as it concerns electric railways, is quite modern and up to date, but it may cause some surprise to many to learn that this subject was one of much importance to street railway men even at a time when the electric railway was in its infancy, some twenty-two years ago.

The details of what is thought to be the earliest experiment ever made to obtain data on rail wear came to light this fall when the tracks of the old Nassau Electric Railroad in South Eighth Street, Brooklyn, were opened for the purposes of overhaul and repavement. Upon examining the tracks carefully, preparatory to starting work, attention was called to a number of cast-iron boxes having removable covers and somewhat similar to boxes now used for protecting heel-tightening devices at switches. (See Figs. 1, 2 and 4.) They were attached to the outsides of the rails of one track and located at fairly regular intervals. Inquiry among those long in the track division service failed to elicit information as to their purpose, but there was an impression that they had been installed for some experimental purpose by the late Tom Johnson, who was interested in both the Nassau Company and the Johnson Company (now the Lorain Steel Company).

A sketch of the boxes was prepared and sent to the Lorain Steel Company with a request for information, with the result that the details and a very interesting report on a rail wear experiment made over the period

from 1895 to 1898 came to light again. The steel company forwarded a copy of a paper on "Rails: Their Construction from a Scientific Standpoint," by A. J. Moxham, read before the American Street Railway Association at its seventeenth annual meeting in Boston in 1898, together with blueprints of the box design and also a special steel micrometer-caliper measuring instrument (see Fig. 3) which had been made especially for the experiment by Brown & Sharpe. The accompanying correspondence indicated that the boxes had been installed as a part of the arrangements made by Mr. Moxham to obtain data relating to rail wear on special test rails, and that the data thus obtained formed the basis of the paper above mentioned.

A little later the chief engineer of the Lorain Steel Company, E. B. Entwisle, and the writer went to South Eighth Street, taking along the instrument with the intention of trying to get new measurements, but it was found impracticable to obtain them as was originally done because of the corrosion of the rail bases. The former measurements had been over-all height measurements, and it was evident that no results even reasonably accurate could now be had. However, a section of one of the rails was cut out, scribings were made from it and impressions were taken of others. These have been plotted over drawings of the original sections.

The paper read by Mr. Moxham does not state the rail sections used, although their heights are given. Neither does it give the relative position of the rails; but the box design, checked against street conditions, indicated two of the sections and the fact that only one half-groove rail was found led to the identification of the third rail section as well as to a reasonably safe conclusion as to their relative position. The two principal sections were L. S. Co. 85-268, 7 3/16-in. and 90-206, 8 25/32-in. tram girder rail. The third section was P. S. Co. 90 1/2-222, half-groove girder. There were two of the latter originally installed while but one now remains in service.

The head wear in cross-section to date on the three sections is approximately as follows:

Section	Height	Original Head Area, Sq. In.	Amount Worn Sq. In.	Per Cent Worn
85-268.....	7 3/16 in.	1.88	0.56	29
90-206.....	8 25/32 in.	2.05	0.58	28
90 1/2-222.....	8 25/32 in.	2.05	0.56	27

The original head areas include only the areas above a line connecting the top of the tram with the under side of the back of the head, thus excluding wear on trams. The maximum vertical wear at a point 1/4 in. back from the original gage line on all three rails was found to have been substantially at the rate of 1/64 in. per year.

Accurate statements of the car traffic sustained dur-

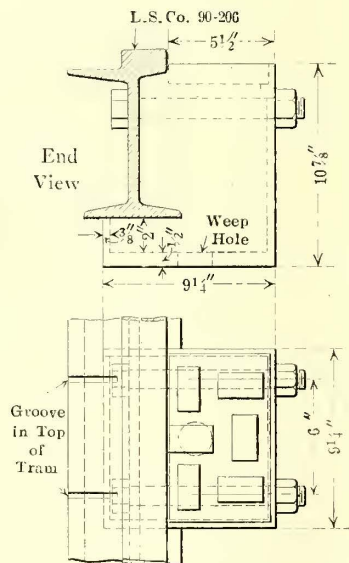


FIG. 1—DETAILS OF BOX FOR USE IN MAKING RAIL MEASUREMENTS

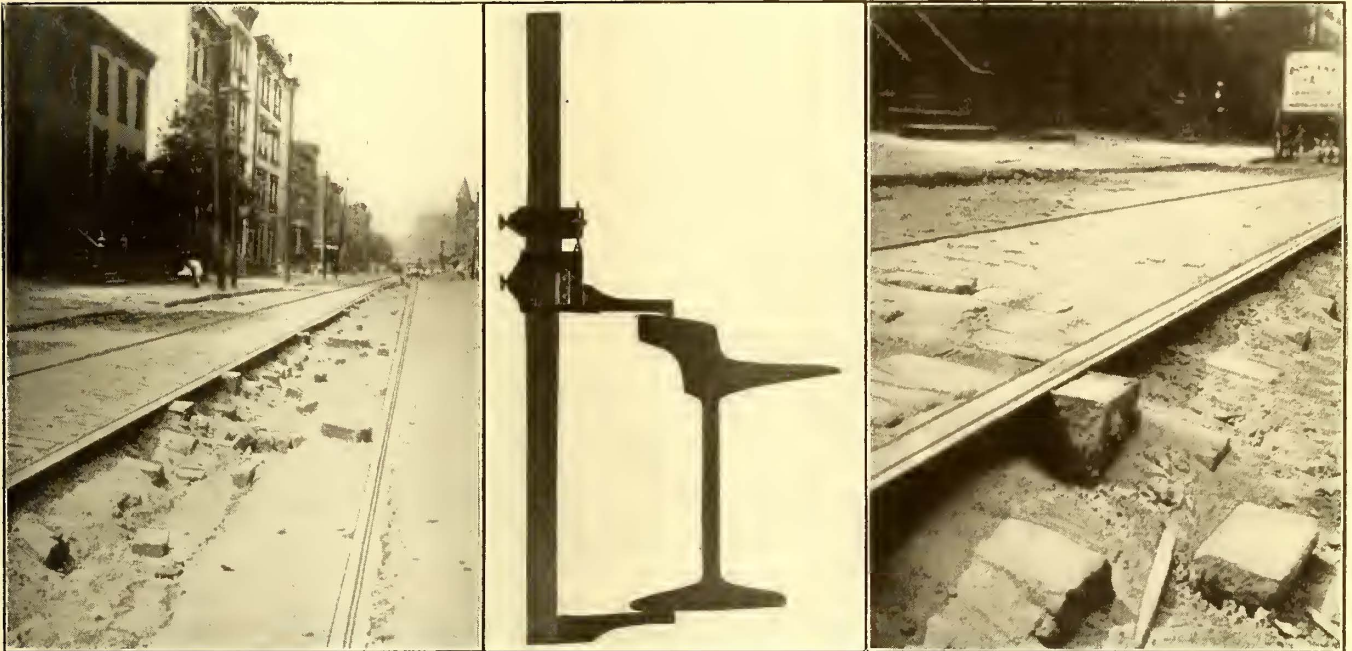


ing this time are not available. It is known that the two-minute headway which obtained during the three years of the experiment was probably continued until about 1904, when it became somewhat less due to re-routing of cars caused by the opening of the Williamsburg Bridge. It is estimated that at least 9,631,000 wheels have passed over each of the rails if a four-minute headway of eight-wheel cars be assumed for twenty hours per day.

It will be of interest to state that we left the 9-in. rails in place, as they should last more than five years longer. The 7-in. rails having a base originally 4 in.

Mr. Moxham's paper on "Rails" previously referred to was an important contribution to the sum of our knowledge on the subject and parts will bear repetition here, as many of his observations and conclusions then reached are quite as pertinent to-day. Following is a general description of the object of the experiment and the plan for obtaining rail-wear measurements.

The experiments have lasted for three years. The first endeavor was to take broadly a "soft" steel and a "hard" steel for the rails to be tested, securing the difference by carbon alone, leaving all other ingredients as nearly as possible the same. The experiment with these started in October, 1895, and has been continuous ever since. In



FIGS. 2 AND 4—RAIL MEASUREMENT BOXES IN PLACE; FIG. 3—MICROMETER CALIPER FOR USE IN MAKING RAIL MEASUREMENTS

wide had to be removed, not because of head wear or joint conditions, but because the base was so badly corroded, particularly on the gage side, as to prevent spiking. On that side the base was of less width than on the head side, the rails having been designed primarily for use on cable roads whose special yoke construction required the eccentric base. It is also to be noted that the 7-in. rail section 85-268 had a curved head originally.

As a matter of some historical interest it is worth recording that the tracks in South Eighth Street were found to have electrically welded joints of the "bar-weld" type which were installed by the Lorain Steel Company in 1898, three years after the rails were laid. When first put down, the regular bolted joints had been used. The steel company advises that this was the first practical application of its "bar-weld" process, using pressed steel bars having raised bosses, and that the only substantial changes since made in the process have covered the use of the new shape of bar providing head support directly at the joint and the increase of the time the bars are held under pressure from one and one-half to two minutes then used to four or five minutes now considered essential. The major portion of these joints are still good and were left undisturbed. A fair idea of their present condition may be gained from Fig. 9, on page 171.

June, 1896, additional rails were added to the experiment, supplied by the West End Street Railway Company of Boston, which at that time had determined (with wisdom, as will be seen subsequently) upon a steel both hard and ductile. The conclusions, therefore, are based upon what may be termed soft, hard, and hard and ductile steels.

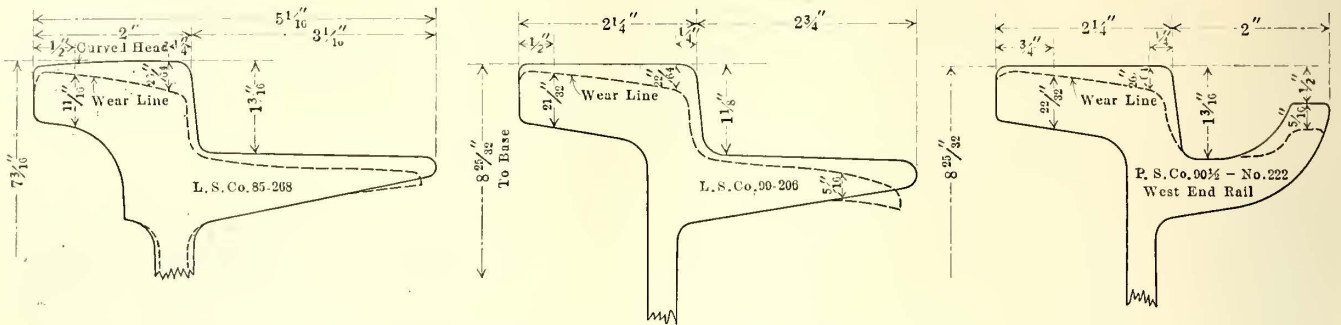
The rails (some thirty-three in all) were laid in the South Eighth Street tracks of the Nassau Electric Railroad of Brooklyn. They were laid continuously, so that the same car is obliged to pass over every rail, and therefore each rail is subject to the same wear, and the wear on the head only is considered. Street traffic is ignored. The point was selected as one that would give great wear in a short time, in order to reach early conclusions, as the cars pass this point at extremely short intervals.

Every rail has been measured at two points, taken about 10 ft. from each end, in order to eliminate the special wear at the joints. Each rail has two cast-iron boxes bolted to the outside, at the points to be measured, to permit access for purpose of measurement without disturbing the road-bed. Originally the wear was registered both by actual measurement and by taking an impression of the head of the rail by means of type-metal castings. Two slots were provided in the tram of the rail to guide the type-metal mold. Notwithstanding the great care that was exercised in taking the impressions, this method of measurement was quickly given up as the results were far from being as accurate as those taken by micrometer calipers. With these calipers, measurements of each rail are taken at three points across the head of the rail; No. 1 being at a point near the gage line, No. 2 being nearly in the center of the head, and No. 3 being nearer the outside of the head. Speaking accurately, No. 1 is 2 in., No. 2 is 1½ in. and No. 3 is ¾ in., all from the outside of a head 2¼ in. wide. Methods were adopted for accurately locating the same line, so that the comparisons in the different measurements of wear are to be relied upon.



The paper then states that "soft" rails having low carbon, 0.28 per cent, and "hard" rails containing what was then considered high carbon, namely 0.59 per cent, were used, and that an effort was made in their manufacture to keep the other ingredients exactly the same so that any difference between the two classes of steel

relation of this arbitrary specific gravity to the relative wear shown in the test. . . . The analysis shows that what is needed is the densest steel." Referring to ultimate strength in tension, he notes that this closely follows the determined wear, but that the elastic limit in tension does not, the indication being that having



FIGS. 5, 6 AND 7—TRAM AND GROOVED GIRDER RAIL SECTIONS, NEW AND AFTER MORE THAN TWENTY YEARS' WEAR

as far as chemical differences were concerned could safely be laid to the carbon. Careful comparisons were also made covering specific gravity and physical tests both in tension and compression. After the experiment had proceeded about a year, a third class of rails was added. These were furnished by the West End Street Railway of Boston and had been made to its specification. They had practically the same carbon content as the "hard" rails but with silicon considerably higher. Phosphorus was lower and manganese higher than in the "hard" rails. The object of the West End company was to combine hardness with ductility.

Table I gives the averages of the physical tests as they appear in the paper. In commenting on these

reached a given amount of hardness and consequently strength, the more ductile rail will give better wear. In commenting on the elastic limit in compression, he notes that "while it would appear that the rail compressed the least would wear longest, where the difference in compression is indicative of greater elasticity without sacrifice of ultimate strength, it is within reason to the good."

In speaking of chemical compositions, he notes that "the greater durability of the hard rail as compared with the soft, speaks for higher carbon," and that carbon is practically the same in the West End rail as in the hard rail, the real point of difference here being in lower phosphorus and higher manganese, it being "well known that low phosphorus accompanied by an increase in manganese conduces to greater ductility." He then states that cost here enters due to manufacturing difficulties in lowering phosphorus in standard Bessemer steel and adds that it would cost \$2 per ton more than the \$25 per ton which was the average price for girder rails. (This is of interest at the present time in view of war prices of about \$70 per ton with no

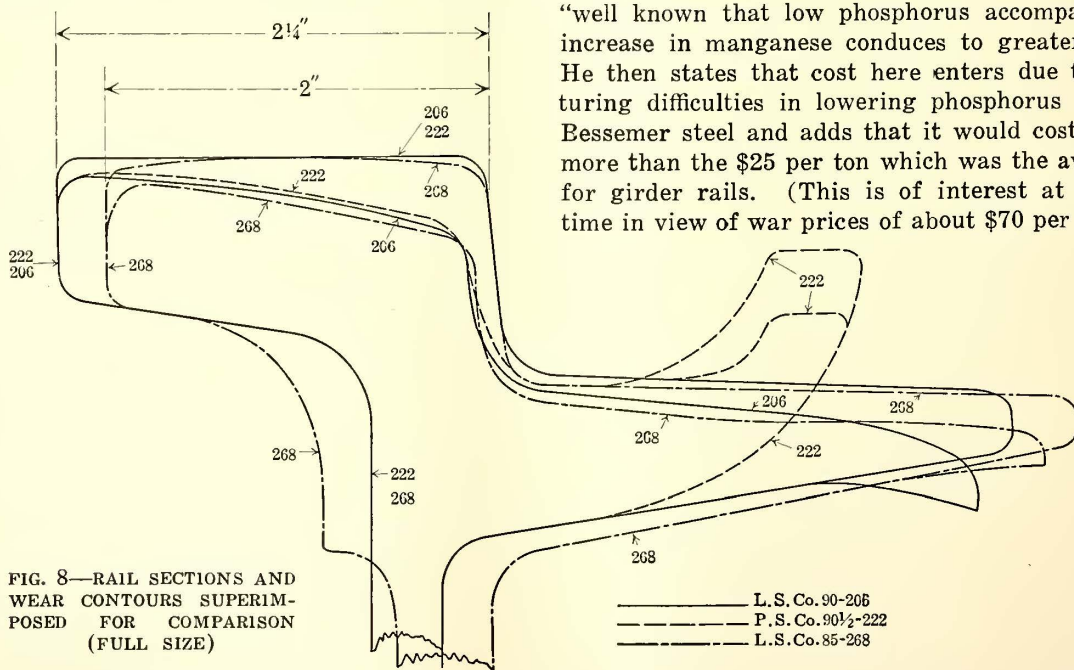


FIG. 8—RAIL SECTIONS AND WEAR CONTOURS SUPERIMPOSED FOR COMPARISON (FULL SIZE)

— L.S. Co. 90-206  
 - - - P.S. Co. 90 1/2-222  
 . . . L.S. Co. 85-268

tests Mr. Moxham says in regard to specific gravity: "It will be found a law that where specific gravity is referred arbitrarily to the iron and the metalloids deducted, the specific gravity will tally closely with what is to be expected from the actual use of the metal, . . . and it is interesting to note the very close

delivery promise.) The low phosphorus question is now apparently well settled in present practice, due to the use of open-hearth steel, and it is also to be noted that present specifications generally ignore sulphur, probably because it runs under 0.05 per cent in basic open-hearth pig iron.



TABLE I—AVERAGES OF TESTS OF RAIL STEEL TAKEN FROM MR. MOXHAM'S PAPER OF 1898

Specific Gravity at 60 Deg. F.	Tension Test			Compression Test			Class of Steel	Specific Gravity, Iron only, deducting "Metalloids"
	Elastic Limit Lb. per Sq. in.	Ultimate Strength Lb. per Sq. in.	Elong. in 8 in.—per cent	Reduction of Area—per cent	Elastic limit—Lb. per Sq. in.	Modulus of Elasticity		
7.855	45730	75860	24.3	51.6	35,000	30,000,000	Soft	7.956
7.841	62500	118100	11.9	18.4	50,300	31,900,000	Hard	7.971
7.825	53160	121380	11.5	20.0	47,100	28,100,000	Hard & Ductile	7.977

TABLE II—AVERAGES OF CHEMICAL ANALYSES FROM MR. MOXHAM'S PAPER, COMPARED WITH AM. EL. RY. ASSO. STD. CLASS B.

	Soft	Hard	Hard & Ductile	Analysis suggested by Mr. Moxham	Am. El. Ry. Asso. Std.—1913 Spec.
Carbon	0.280	0.590	0.570	0.550	0.70—0.85
Silicon	0.026	0.056	0.234	0.100 or under	0.20 not over
Phosphorus	0.106	0.097	0.050	0.080 or under	0.04 not over
Su phur	0.066	0.059	0.078	0.060 or under	Not Stated
Manganese	0.790	0.830	0.980	0.830 or over, not to exceed 1.00	0.60—0.90
Iron	1.268 98.732	1.632 98.368	1.912 98.088		
	100.000	100.000	100.000		

Table II gives a comparison of the chemical analyses of the test rails as well as an analysis suggested by Mr. Moxham and the analysis now given in the American Electric Railway Engineering Association standard specification for open-hearth girder rails, Class B.

Mr. Moxham closes his paper with some quite prophetic comments upon the rail joint question and four conclusions, saying:

During later years we have heard less of this joint question, for as compared with earlier joints (of the bolted type) the track is comparatively smooth. Nevertheless, the evil still exists, and a few years from now (1898) those who are to-day deluding themselves in the belief that they have a long life for their existing tracks will awake to find out that even the construction of to-day is wasteful and extravagant in this respect. The joint which is accepted now as being passably fair is reducing the life of the rail to one-half or perhaps even one-third of what it should be.

The conclusions we are led to seem to me to be as follows:  
 1. That for street railway use a "hard" rail will give the best results. 2. That the most economical way to secure this hardness is by increase of carbon, accepting the manufacturers' standard specifications for the other ingredients. 3. That the next step should be toward an improvement of the joints.

As is well known, the writer has pinned his faith to the electrically welded joint as settling the question once for all by making the union homogeneous with the rail and possessing an advantage from an electrical standpoint in the matter of conductivity. Nevertheless, the cast-welded method also demands careful consideration. It is certainly preferable to anything in the nature of splice bars that we know of, provided one glaring fault can be overcome, viz., the softening of the steel that occurs from the large body of hot cast metal located at that point, and it would appear that some means could be devised to overcome this evil.

4. After making the joints perfect, what we have termed the "West End rail" would certainly justify its extra cost. As the analysis of each rail is embodied in this paper, I need not here refer to it.

The great lesson I would once more emphasize is that until you get the joints perfect you need not worry about the quality of your steel; anything in the shape of steel—the very cheapest you can buy—will last longer than the joints will permit you to keep your rails in the track.

Table III gives the average monthly wear of the test rails as reported by Mr. Moxham. It also indicates the estimated wear of the rails at the same rate for twenty-two years of service for the soft and hard rails and twenty-one years and two months for the West End rail. The actual wear as found from the scribings taken last fall have been added and the contours obtained are shown in Figs. 5, 6 and 7, while a composite

drawing of the three rails and wear contours appears full size in Fig. 8.

It will be noted from Table III that the actual vertical wear now found on the hard and soft rails agrees fairly well with the estimated wear at the original reported rate, but that the rate of wear on the West End rail has increased and is very close to that of the hard rail, so close that it is a question as to whether the "hard" rail has worn more than the West End if allowance is made for ten months' less service. The question also arises as to whether Mr. Moxham did not

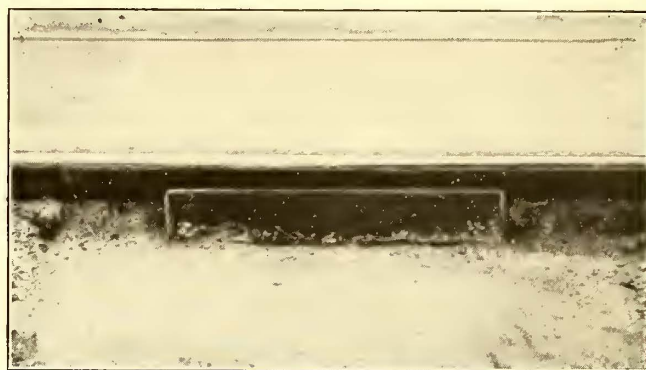


FIG. 9—BAR WELD INSTALLED IN BROOKLYN MORE THAN TWENTY YEARS AGO

overlook an important point in comparing the wear of the hard and soft rails in neglecting to account for the difference in width of heads and the curved head, the "soft" rail head being only 2 in. wide, so that the soft rail presents about 12 per cent less width of wearing surface, which in turn would no doubt increase the rate of wear through load concentration. There is some substantiation for this view also in the fact that the actual cross-section area in the head of the "soft" rail is about 9 per cent less than that of the "hard" rail. Meanwhile there seems to be no definite reason assignable to the increased rate of wear found in the West End rail, which is now worn substantially as much as the "hard" rail, if allowance be made for the difference in length of service.

The conclusions now reached as a result of the in-

TABLE III—AVERAGE MONTHLY WEAR ON TEST RAILS REPORTED BY MR. MOXHAM IN 1898 COMPARED WITH WEAR FOUND AT END OF TWENTY-TWO YEARS

Kind of Steel	Monthly Wear reported by Mr. Moxham	Length of Service	Estimated Wear at same rates	Estimated Wear at same rate, expressed in fractions	Length of Service	Approx. Wears Found	Wears found expressed in fractions	Rate per year found
	inches		inches	inches		inches	inches	
Soft.....	0.0017	34 Months	0.4488	$\frac{27}{61}$ —	264 Months	0.4063	$\frac{26}{64}$	$\frac{1}{4}$ in. strong
Hard.....	0.0012	34 Months	0.3168	$\frac{29}{91}$ +	264 Months	0.3437	$\frac{22}{64}$	$\frac{1}{4}$ in. exact.
West End.....	0.0007	26 Months	0.01778	$\frac{11}{64}$ +	254 Months	0.3125	$\frac{20}{64}$	$\frac{1}{4}$ in. scant.



## Railways Agree on Need of Publicity

Doherty Properties Answer Questionnaire By Saying That Public Must Be Kept Informed of Conditions—Important Views on Methods and Means

THE electric railways operated by H. L. Doherty & Company, New York, N. Y., are almost unanimously of the opinion that publicity, and lots of it, is the surest way to make the public sympathize with the difficulties of electric railway operation.

This expression of opinion is the result of a recent canvas by means of a questionnaire. When it was decided last autumn that in view of the war and other conditions the annual convention of the Doherty railway department should be abandoned, a questionnaire was sent out to the managers with the idea of having the answers circulated.

The list of the questions regarding the publicity end of the business was prepared by E. R. Kelsey of the Toledo Railways & Light Company, and the answers have been compiled by R. F. Carbutt, railway engineer of the organization. The main points of the report have been printed and are now being circulated under the direction of the committee in charge, which consists of E. R. Kelsey, R. L. Baker and J. H. Van Brunt.

The properties were unanimous in the belief that a central publicity department for the Doherty traction properties would be advantageous. Furthermore, the managers believed that publicity should be handled also by local publicity departments in order to meet local requirements. Several properties were in favor of distributing pamphlets in the cars, and they also favored

*(Concluded from page 171)*

investigation of this early rail wear experiment are as follows:

1. There is still some question as to the effect of the chemical composition on the wear of rails, as it is believed that the experiment as originally reported failed to account for the important factor of head width.

2. Nevertheless, it is thought that the high carbon now incorporated in the standard analyses should be maintained, notwithstanding the rather peculiar performance of the West End rails.

3. It is quite true that, while perfection of joints considered as most essential by Mr. Moxham has not been reached, there are several methods of joining rails now in use which are giving excellent results with very small percentages of failure. We are, therefore, justified in a reasonably high expenditure for a good quality of rail steel.

4. The result of this twenty-two-year-old experiment indicates a rate of vertical wear on old Bessemer steel rails of substantially 1/64 in. per year, for rails leaving a carbon content of under 0.60 per cent, with a traffic headway averaging four minutes with double-truck cars.

5. It is to be regretted that this original experiment did not include a method of measurement which would now admit of duplication with greater accuracy. Hence the results now obtained are subject to a number of factors which permit much more variation than is desirable in obtaining information of this character, and the data now reported must be considered with this in mind.

meetings and talks with employees in order to educate them in the matter of explaining things on which the patrons seek information.

In regard to the local press and its relations with the company, all answers agreed that the newspapers should be taken into the confidence of the company, and that all the newspapers should be made to feel that all the news would be given to them promptly and accurately. It was also stated that news of accidents should not be suppressed. The experience of Mr. Doherty and Mr. Coates in Toledo in regard to publicity was pointed to by many managers as being proof that complete frankness with the newspapers was the one and only way of making friends with them.

### COURTESY ON PART OF EMPLOYEES IS DEEMED ESSENTIAL

Courteous employees was another point emphatically emphasized as essential to a successful publicity campaign. It was pointed out that discourtesy on the part of employees can destroy all the benefits which are gained through printed and other publicity. Commenting on the courtesy part of the problem, C. D. Flanigen of the Athens Railway & Electric Company, Athens, Ga., said: "The most effective way is to have it (courtesy) in the atmosphere like ozone, to kill automatically all germs of discourtesy."

Regarding the points about the operation of electric railways which the public should know, all the managers agreed that the most important fact which the patrons should realize is the increased cost of everything that goes into the make-up of a car ride. In this same category of publicity was included the general ignorance of the origin of the paving charge. It was pointed out that if the patrons knew that it was a relic of the old days of the horse car there would be little difficulty in having the clause taken out of franchises.

It was agreed that the best way to get this sort of information before the public was by newspaper advertising and posters in the cars, and by officers taking advantage of every opportunity to talk to clubs and civic organizations about it.

### COST AND OTHER POINTS

In answer to the question, "What portion of the company's gross receipts should properly be set aside for the purpose of advertising and publicity?" the answers varied. Most of the managers said 1 per cent, but some went as high as 2 or 3 per cent.

There was a question regarding the best means of handling the advertising space sold in cars. Many believed that more revenue could be obtained by handling the advertising directly than by having it attended to by an agency. There were several suggestions that the matter could be handled best through the central advertising department at the New York office.

Among the other suggestions made were several recommendations in favor of publicity regarding the financial condition of the companies; illuminated schedules on business corners; better car marking; explicit printed directions to guide patrons, and similar items to contribute to the comfort and convenience of passengers in order that they might become entirely satisfied with the service rendered.



# Light-Weight Safety Cars Best for All\*

The Public, Company and Employee All Benefit from Their Introduction—Advantages to Each Analyzed

BY W. G. KAYLOR

Westinghouse Traction Brake Company

**T**HE advent of the light-weight, quick-service safety car handled by a single operator marks a most important epoch in the development of the street railway industry. In the operation of electric railways we must recognize three factors, as follows:

1. *The Public.*—It is the community that gives the street railway its excuse for existence. It is their patronage that pays our bills.

2. *The Investor.*—It is the financier on whom we depend to furnish the capital to run our road.

3. *The Employee.*—It is the officers of the company—the clerks, the shopmen and the platform men—on whom the investor and the public alike depend to properly handle their investment and to sell their service.

To prove the success of the safety car we must show that the three parties referred to are benefited thereby.

Likewise, the corollary is true. The benefits derived from the operation of safety cars must be divided equitably among these three parties or its success will not be assured.

To the public the safety car offers more frequent and faster service and more comfortable and safer riding. Three safety cars will displace two ordinary cars and cut the weight in two, yet provide seats for 10 per cent more passengers. Equipped with modern motors and ball bearings on the axles, the safety car accelerates at 2½ to 3 m.p.h.p.s., or faster than the average jitney can get started. Therefore, in actual competition with jitneys, the safety car gets away ahead of them, picks up the passengers at the next corner and is off again before the jitney can pass the car. As has been proved in jitney infested centers, the safety car has driven them off the street.

The fact that the safety car carries fewer passengers than the ordinary car simply means a reduction in the number of stops, thereby contributing to an increased schedule speed. For instance, if the schedule speed of the ordinary car were 8½ m.p.h., the safety car under the same conditions would make approximately 10½ m.p.h.—an increase of 25 per cent. The car is mounted on 24-in. wheels on an 8-ft. wheelbase. Lost motion between car body and truck has been eliminated, thereby doing away with the undesirable pendulum motion of car body under rapid acceleration and braking. Furthermore, the car body is so suspended on the trucks as to provide for a natural swing or lateral

movement when it takes curves or sidings. In addition to this there are a low step and cross seats, all of which contribute to the comfort of the riding public.

The safety of the passengers is cared for by automatic devices interlocked with the control of the car. Although the car is operated by one man, it is safer than a two-man car not equipped with these automatic devices. The standard safety car has straight air brakes with emergency feature. Any collision or other accident that breaks the air pipes will stop the car in emergency. Furthermore, the operator cannot leave his post unless the brakes are applied, and if he becomes incapacitated the brakes go into emergency. An emergency application may be obtained by the operator; first, by removing his hand from the controller handle (if the brakes are not already applied in service); second, by removing his foot from a foot valve (used for cutting out the emergency feature in the controller when the operator wants his left hand free to make change or issue transfers without getting an emergency application) and, third, in the usual manner by the brake valve.

An emergency application not only applies the brake with full force as quickly as air can be passed direct to the brake cylinder, but it first shuts off the power and applies sand to the rail. The use of sand on a bad rail will shorten the stop by 20 per cent. At the same time the front and rear doors are unlatched, so that

they may be opened by passengers pressing against them. This is made possible by the fact that the doors are operated by air, and is one of the most important safety features of the car. Otherwise imagine the panic that would arise in case of an accident if the passengers found themselves locked in the car, as they would be if the operation of the doors were not interlocked with the control of the car.

The safe passage of cars at steam railroad grade crossings is well taken care of by the Public Service Commission of Pennsylvania in General Order No. 5, dated Feb. 4, 1914. In the absence of a conductor it provides for

"a watchman, stationed and maintained at the crossing . . . except that at crossings of electric railway tracks by railroad sidings leading to railroad yards, or to industrial plants, where by agreement between the companies operating their cars, trains and engines over the same, it is provided specifically that a brakeman, flagman or employee of the railroad company shall proceed to crossing ahead of the passage of any car, train or engine of the railroad company over said crossing and flag the crossing and warn the

**The public gets more frequent and faster service and more comfortable and safer riding.**

**The investor gets reduced track and car maintenance, accident charges and platform expense with more riding, as well as a car which appeals to the short-haul passenger.**

**The employee gets a car which is easy to operate and usually an increase in wages.**

\*Abstract of paper prepared for Jan. 4, 1918, special meeting of Pennsylvania Street Railway Association, Harrisburg, but not read owing to delay of Mr. Kaylor's train in reaching Harrisburg.



public of the approach and passage of such railroad car, train or engine."

This means that at main-line crossings the street railway company may maintain a flagman instead of having the conductor flag the car, whereas at sidings the steam railroad will flag its own train movements.

In none of the many cities operating safety cars has the public objected to their use. On the contrary, in many ways they have evinced their approval. Whereas on a two-man car 50 per cent of the passengers ask the conductor for change, on safety cars only 10 or 15 per cent call for change. There is an explanation for this. Safety cars have no "riding" platform or reservoir capacity. As a result passengers unconsciously get their exact fare ready as they board the car.

On a two-man car passengers feel that the conductor is there for the sole purpose of collecting fares, and they are inclined to take their time about it. On the other hand, as passengers board a safety car they realize that the operator's primary duty is to run the car rather than collect fares, so they feel it is their duty not to take up any more of his time than necessary so that the car can get under way without delay. Transfers are on a rack at the side of the fare box. They are punched at the end of the run, so that no time is lost in issuing them.

The operator sits far over on the left side of the platform, thereby allowing for as much space as possible for passengers entering and leaving the car. The fact that the passengers board the car at the forward end, right at the side of the operator, enables him to "spot" his car when stopping to pick up passengers. This saves the passengers a few steps, a particularly desirable accommodation at muddy crossings. It also cuts a little time off the length of stop.

#### WHY THE CAR APPEALS TO THE INVESTOR

To the investor, representing the capital invested in street railways, the safety car offers unusual opportunities. A 65 per cent reduction in weight on rails means a material reduction in maintenance of track and roadway, estimated by some engineers as directly in proportion to the reduction in weight. It also means a proportionate saving in power. The saving in platform expense is more than 50 per cent, even if the operator is paid 10 per cent more in wages than he received as a motorman. This is due to the 25 per cent additional mileage made by the safety car. The maintenance of car and equipment is less—due to the reduction in number of wheels, motors, square feet of car surface to be cleaned and painted, etc.

Shorter headways and faster schedules encourage riding, as for instance, a 40 per cent increase in service has occasioned a 60 per cent increase in number of passengers. The safety car operating on a shorter headway caters to the short-haul passenger, the one that it costs the least to handle. The elimination of jitneys brought about by higher acceleration and schedule speed and more frequent service contributes largely to the increase in passenger traffic, as does also the diminution in the use of privately-owned automobiles, enhanced to some extent by war conditions. To summarize it may be said that when the cost per car-mile for operating the ordinary car is 15 cents, the cost per car-mile for the safety car is 8 cents—a saving of 7 cents. Three

cents of this represents the saving in platform expense and the balance in the economies resulting from the operation of a lighter car on a faster schedule.

To the employee, particularly the platform man, the safety car also offers unusual opportunities. A greater exercise of mentality encouraged by additional responsibility is usually rewarded by a 10 per cent increase in wages. Furthermore, the former platform man is advanced in title from a motorman or a conductor to an operator.

No man need lose his job on account of the introduction of safety cars. The change cannot be brought about rapidly enough for that. For a time, it might cause a falling off in the number of "turnovers," but during the war there is such a demand for men no objection has been raised against the safety car on account of its saving labor. On the contrary, employees like the safety car. In cities where they are being introduced there is always a long list of applications from motormen and conductors waiting to be assigned to safety-car runs.

The car is easy to operate. It is controlled by two handles, that of the controller and the brake valve. Sand may be applied in any position by pressure on the brake-valve handle. The control of the doors is also incorporated in the brake valve so that after the brake is applied the operator may open the front door by simply moving the brake-valve handle to the door-opening position. The operator is seated in a comfortable swivel chair and handles the safety car in much the same way as a chauffeur runs an automobile. The elimination of physical strains makes the operator more alert by increasing his mental efficiency. This is reflected in the reduction of accidents.

Furthermore, the ease of operation makes the safety car adaptable to the use of women operators. At this time this point is particularly worthy of consideration. As more men are called into the service, women will take their places, and it will be a long time after the war is over before they leave the various lines of endeavor that they are now entering. The economic and social fabric that is being woven by this war will not be unravelled over night.

#### THE CAR IS NOT AN EXPERIMENT

Safety-car service is not an experiment—it is an established institution. It was on Nov. 1, 1916, that the Summit Avenue line in Fort Worth, Tex., was changed over to safety-car operation. Since then 1000 safety cars have been placed in service or contracted for by sixty different cities of this country. Furthermore, 98 per cent of the one-man cars built in this country during the last two years have been the standard safety car. This fact alone should have an important bearing on the financing of new safety cars, as the question as to whether or not the proposed new cars are of a standard type is one of the first questions asked by the banker. Furthermore, it is just what the industry has been longing for—a standard car and equipment for electric street railway service.

The electric railway manager who says that the safety car may be all right for New Mexico or Texas but that it would never do in his town and that the people would not stand for it, has not made a thorough investigation of this subject. Furthermore, it is not a small-town



proposition. In fact, there are some lines in our largest cities that could be operated to advantage with safety cars. The only limit is track congestion. Where this exists, as it does on Manhattan Island, an attempt to operate more units would have no other effect than to slow down the schedule.

However, in the average city, where the main street only is congested, and that only because most of the car lines converge on it, the movement of cars through that street might be slowed down. But when the safety cars entered the outlying districts their higher average speed would more than compensate for the time lost on the congested street. Very often also congestion can be relieved by rerouting. Vehicular traffic also should be regulated. On some lines it is a menace to operation. Therefore, wherever possible, through co operation with the municipality, such traffic should be routed over other streets where it will not interfere with the operation of cars.

#### WHAT CAN BE DONE NOW?

What has been said so far may be good food for thought, but it does not offer immediate relief. Old equipment cannot be scrapped and replaced at once by safety cars. Furthermore, with the government competing with private enterprises for the use of capital, there is not much of it available for the purchase of new cars and equipment. We must conserve what we have and operate it as efficiently as possible.

Undoubtedly many existing cars could be converted into safety cars and operated advantageously by one man. If the cars are too large for one man to handle during rush hours a conductor could be employed at that time. The question then arises as to what to do with him the balance of the day. Why not employ him in the shop or office? Select the work he is best fitted for and teach him how to do it and so schedule the shop and office routine as to allot certain work to these extra men. This would certainly be conserving man power to the greatest extent and would be a material benefit to the men themselves.

On the other hand, why not consider women as conductors during rush hours? There are many of them who have the time and who are willing to work on a part-time job.

The handling of factory crowds by large cars operated by one man could readily be taken care of by the prepayment method. Arrange to have the factory employees pay their fare before they enter the car. The operator could handle the additional passengers picked up en route. A car seating thirty-two to thirty-six passengers is as large a car as can be handled properly by one man when loaded to capacity.

The safety car also readily adapts itself to the zone system of fares; in fact, it is the exponent of economy and efficiency in operation—the agent that will restore confidence in the electric railway industry.

Several subscribers have written that the leaf containing reading pages 43 and 44 was not included in their bound copies of the issue of this paper for Jan. 5, 1918. The publishers regret this omission and will supply a duplicate of this leaf to anyone whose copy is defective in this way and who will advise them of the fact. The leaf can then be inserted in its proper place.

## A New Association with a Definite Purpose

Freight Agents of New England Electric Railway Properties Have Organized the New England Electric Freight Association

ON Jan. 15, in the offices of the Connecticut Company, New Haven, Conn., the recently formed New England Electric Freight Association held its second regular meeting. The principal feature of the program was the paper by V. S. Curtis, secretary and general traffic agent of the Connecticut Company, on the ruling of the Public Utilities Commission of Connecticut with regard to the rates which may be charged by the Connecticut Company for trolley express service. Mr. Curtis first abstracted the finding of the commission, a report of which was printed on page 1153 of the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 29, 1917. He then explained the fundamental principles for which the company had contended, and which were agreed to by the commission. Mr. Curtis distributed samples of printed matter used in the express department of his company, as well as reprints of the descriptive article printed on page 802 of the issue of this paper for Nov. 3, 1917.

Following Mr. Curtis' address those present discussed the principles with relation to their own properties, and from the discussion it was evident that conditions differ materially with the jurisdiction under which an electric railway does trolley express and freight business. Where the jurisdiction is that of the Interstate Commerce Commission it is more difficult to differentiate between steam railroad and general express traffic and the facilities furnished by the electric railways than where the traffic is entirely intrastate. The burden of the discussion seemed to be that the value of trolley express service should be recognized by the provision of reasonable tariffs.

The New England Electric Freight Association was formed last fall for the purpose of promoting co-operation among the freight departments of the electric railways in this territory. Its membership is limited to one representative from each of the railways. The plan is to meet at frequent intervals at different railway centers in the territory, thus incidentally familiarizing the members with the facilities of each. Pursuant to this policy, an earlier meeting, largely for the purpose of organization, was held at Boston, and the third meeting will be held at Providence on Feb. 21.

At present R. E. Cosgrove, Springfield (Mass.) Street Railway, is president of the association and F. C. Lewis, Boston & Worcester Street Railway, Framingham, Mass., is secretary. The other members are C. T. Battey, Union Street Railway, New Bedford, Mass.; Leon Bolster, Connecticut Valley Street Railway, Greenfield, Mass.; V. S. Curtis, the Connecticut Company, New Haven; T. E. Leland, Bay State Street Railway, Boston, Mass.; H. R. La Montague, Worcester (Mass.) Consolidated Street Railway; A. E. Paddock, Rhode Island Company, Providence; D. C. Peck, Shore Line Electric Railway, New London, Conn.; A. Pollard, Fitchburg & Leominster Street Railway, Fitchburg, Mass.; H. B. Potter, Boston Elevated Railway, and F. E. Wood, Cumberland County Power & Light Company, Portland, Me.



## Annual Meeting of Central Electric Traffic Association

Chairman Neereamer Describes the Work of the Different Committees and Calls the Year a Successful One

THE annual meeting of the Central Electric Traffic Association was held on Jan. 15, at which time A. L. Neereamer, chairman, presented his annual report, which covered the year ended Dec. 31, 1917. There was no election of officers because, under the constitution, the presiding officer of the association is the secretary of the Central Electric Railway Association. An abstract of Chairman Neereamer's report for the year follows:

### ABSTRACT OF ANNUAL REPORT

Although the year just passed has been a very strenuous and busy one, yet this association has held six meetings as follows: Indianapolis, Jan. 16-18, and Feb. 20-22; Fort Wayne, April 3, May 15 and Nov. 20, and Dayton, Sept. 18. The two held at Indianapolis were for the purpose of completing the checking of the rates in Joint Passenger Tariff No. 18. The other four were regular business meetings.

There has been very little change in the membership of this association, although a slight increase. We now have fifty-one lines (members of the Central Electric Railway Association), representing 4334 miles. This is an increase of two lines and of 101 miles. Only such lines members of the Central Electric Railway Association as have furnished the chairman with power of attorney are considered members of the Traffic Association.

Joint and Local Baggage Tariff No. 9, canceling No. 8, was issued on March 28, 1917, and has had one supplement, which was issued to take in the Northern Ohio Traction & Light Company.

Joint and Local Passenger Tariff No. 17 was issued on March 29, 1917, canceling Joint and Local Passenger Tariff No. 16, and covers the Central Electric Traffic interchangeable 1000-mile ticket. This tariff is still in effect, and, like its predecessor, covers thirty-five lines, representing 3550 miles. During the year just ended 4600 of these tickets were ordered and placed in the hands of agents for selling, making a total since the inception of the mileage ticket of 43,400 tickets. At the meeting held in Fort Wayne on Nov. 20 it was decided to cancel this tariff, withdrawing the mileage ticket from the market. Before this cancellation was made, the matter was taken up by the executive committee of the Central Electric Railway Association at its meeting held in Toledo on Dec. 4, 1917, where it was decided to issue an interchangeable penny-coupon book, covering 2000 1-cent coupons to be sold for \$17.50. Your chairman is now trying to ascertain from the members just what lines desire to participate in this new publication so that an application may be filed with the various commissions asking for permission to cancel the mileage ticket tariff and replace it with a tariff of this kind. This will be done as soon as the information is received from all of the member lines.

Official Classification No. 43, covered by our I. C. C. No. 17, and effective the first part of 1916, has had four supplements issued during the year, either on special

permission or on orders of the Interstate Commerce Commission, while Official Classification No. 44, which was filed by R. N. Collyer, agent for the interurban lines, has been in effect for a year. It is to be hoped that the commission will very shortly make final decisions which will allow for the complete cancellation of this issue.

Joint Freight Tariff No. 13, covering exceptions to the official classification and issued on Aug. 1, 1916, with its two supplements, is still in effect, although the question of reissuing this publication has been up for consideration during the past year. Pending the settlement of certain applications, the committee having it in charge has been instructed to hold it until further notice.

Official Interurban Equipment Register No. 4 was issued on April 30, 1917, and covered the correct dimensions of cars of the participating carriers up to and including that date. As some of the member lines have purchased new equipment since that time it is suggested that such lines furnish the chairman with the information regarding this new equipment, so that a supplement may be issued or if necessary the tariff reissued to cover all of the changes.

Our official map committee completed its work on the revision of the map and the map was corrected during the first part of the year and a new copyright secured. There has been considerable demand for this map from all over the territory as well as from various government and state officials, and from the number of requests which the chairman has been receiving recently it would appear as if our member companies had exhausted their supply. It is to be hoped that our members will continue to distribute this map, which is one of the best advertisements put on the market by any transportation company in this or any other territory.

Joint Passenger Tariff No. 18, which canceled Joint Passenger Tariff No. 14, was issued on April 25, 1917, and has had one supplement, which was issued at the request of the Interstate Commerce Commission. We now have pending with that commission two applications to supplement this tariff, and the necessary supplements will be issued just as soon as permission is granted. Owing to the recent increases in rates granted the Ohio lines and the various applications for increases which are now pending in Indiana and Ohio, it will be but a short time when this publication will have to be reissued.

Joint and Local Demurrage Tariff No. 3, issued on Aug. 10, 1916, has had five supplements issued to it, not including the one supplement issued to cover Indiana conditions. There is now in the hands of our committee on demurrage and storage the question of issuing another supplement to conform with the recent regulations put in effect by the steam railroads. Owing to a number of changes that have been made in the demurrage rates, the chairman would not recommend the reissuing of this tariff until matters have settled down and some permanent basis agreed upon.

The attention of the association is called particularly to the work of two of our committees during the past year. One was a committee appointed for conference with the Central Freight and Central Passenger Associations. The other was a committee on military traffic. These two committees have accom-



# Economics of Hydroelectric Power Development\*

The Author Compares the Status of Water Power and Steam Power, Showing How the Former Is Handicapped In Its Competition with the Latter Both Economically and by Virtue of Statute

BY CALVERT TOWNLEY

Assistant to the President Westinghouse Electric & Manufacturing Company, New York City

THE introduction of electricity as a means for transmitting power over considerable distances and its subsequent rapid development completely changed the status of hydraulic power. Previously such power could only be used near falling water. Now it is commercially available in convenient form within a radius, in some instances, up to 200 miles.

Along with improvements in the art of electrical transmission have come equally rapid developments in the application of electricity. Electric light has become almost the universal illuminant. Electric motors largely drive our factories and propel all our street cars. They have made substantial progress in replacing steam locomotives on some large railroads.

In an endeavor to supply the demand for electric current thus created large central generating stations have been established in or near all large centers of population.

## LIMITATIONS OF WATER POWER

In the light of the foregoing, it might seem reasonable to suppose that a large proportion of the modern demand for electric current would be supplied from the energy in falling water. Such, however, is not the case. It has been estimated by a careful engineer that in 1911 there were over 26,000,000 steam engine horsepower capacity in use, including railroad locomotives, in the United States. The aggregate water horsepower developed and undeveloped has been computed as around 60,000,000. Of this latter the United States Census of 1912 gives 4,870,000 as developed, and in a report of January, 1916, the Secretary of Agriculture estimates

(Concluded from page 176)

plished a great deal of good for the member lines of this association, a large part of which can be termed an intangible benefit, and the results are the attainment of certain progressive policies for which the association has been working a number of years.

This has been a very successful year, and, while the Central Electric Railway Association and the Central Electric Railway Accountants' Association have held no meetings other than the annual meeting of the Railway Association in March, this association has worked in unity and has been the means of keeping together the interurban lines in this territory. A large percentage of the credit for this work is due to the untiring efforts of the members of various committees to whom have been referred matters of vital importance to the lines in this territory. In conclusion the chairman desires to extend to all of the committees and to the members, both individually and collectively, his sincere thanks for the hearty support and co-operation given during the year passed.

this total to have been increased to 6,500,000. Making liberal allowances for correction in these several figures it seems probable that there is in service from four to five times as much steam as water horsepower and that there is still undeveloped water horsepower equal to at least twice that of all the steam capacity in service.

There are two fundamental causes which have militated against the substitution of hydroelectric for steam-electric power. One is economic and permanent; the other is statutory and therefore subject to modification. Both reasons apply to some powers but neither, fortunately, to all. The economic and permanent reason is high cost of development due to natural conditions. Electric power generated by falling water is inferior to that generated by steam in every particular except cost and, therefore, water-driven service must be cheaper than steam-driven in order to justify its existence. The price for service depends primarily on cost, and cost divides itself naturally into two main items, namely, operation (including maintenance) and fixed charges. As a hydroelectric plant consumes no fuel its operating cost is less than that of an equivalent steam-driven plant. On the other hand, a steam plant costs usually only from one-fifth to one-half as much per unit of capacity as a hydroelectric plant, so that the latter must carry very much heavier fixed charges. Therefore, when steam is to be the motive power, only such capacity is installed as initial demands require and the cost per unit is fairly proportional to that of the ultimate development. On the contrary, in a water development, a large part of the cost is for riparian rights, for the dam, impounding reservoir, flume, forebay, etc., and for the transmission right-of-way, towers, etc., which must be largely provided and constructed at the start for the complete installation. The obvious result is a greater fixed charge per unit of capacity and a higher cost per horsepower delivered for sale.

## SITUATION NOT SERIOUSLY AFFECTED BY RISE IN COST OF COAL

It has been frequently pointed out that as the nation's coal supply is depleted the cost of coal must rise, thus increasing the cost of steam-electric power as a competitor and raising the market value of hydroelectric power accordingly. The rising price of coal is a matter of record, but it is not so generally known that the improved efficiency of steam-producing machinery (boilers, engines, generators and auxiliaries) has more than kept pace, so that the net cost of producing electric power from coal has steadily declined. As applied

\*Abstract of a statement submitted on Jan. 14, 1918, to a special committee of the United States Chamber of Commerce on behalf of the Engineering Council, by whose executive committee it was duly approved.



to the pre-war period it may be stated that over a period of ten years the cost of coal has risen on an average 1 per cent per year while the cost of electric power produced from coal has fallen on an average  $2\frac{1}{2}$  per cent per year. It is a reasonable assumption that further advances in the art will cut down both the fixed charges and the operating cost of steam power as a competitor of water. The cost of a steam-electric plant per unit of capacity just before the war was about one-third what it was fifteen years previous, while the energy it produces per pound of coal had increased 50 per cent.

Many sites which fifteen years ago might have been developed to sell energy in successful competition with steam at its then cost could not now be so developed, and in consequence their development is no longer commercially possible. The cost of producing power from either water or steam is a function of load. Fixed charges remain practically unchanged in both instances whether the output in energy be large or small, but with a steam plant increased output means increased fuel consumption, while a water plant operates either with or without load with but little variation in expense. To illustrate: assume a steam plant using  $2\frac{1}{2}$  lb. of coal per kilowatt-hour at a price of \$3 per short ton and having a plant or output factor of 35 per cent—that is to say, an output equal to 35 per cent of its theoretical output if every unit were loaded to capacity twenty-four hours each day of the year. Under these assumptions the cost of fuel per unit of installed capacity per year would be \$11.50, and if the other operating and maintenance charges be assumed to fairly offset those of a water installation of equivalent size \$11.50 represents the additional fixed charges which the hydroelectric plant could carry and produce power at an equal cost. If the fixed charges (interest, taxes, insurance and amortization) total  $11\frac{1}{2}$  per cent, therefore, the hydroelectric investment per kilowatt capacity could exceed that of steam by \$100. Many hydroelectric developments exceed the cost of equivalent steam-driven systems by much greater amounts.

#### WATER POWER IS HANDICAPPED IN COMPETITION WITH STEAM

Further, as has been previously stated, hydroelectric power is inferior to steam-electric power. The reasons are elementary. Stream flow is subject to seasonal variation, and therefore to complete or partial interruption by drought in summer and by ice in winter. Floods are a menace. Long transmission lines may break from wind or sleet or the service be disarranged by lightning. The losses on such lines vary with load and are frequently responsible for annoying pressure variations. On account of these and other reasons hydroelectric power cannot prevail against steam competition at the same or a slightly lower price. It must be materially lower.

We do not mean to imply that water power may not be a commercially practicable competitor of steam. We do wish, however, most emphatically to combat the widely held but mistaken view that any water-driven plant will produce power at lower cost than steam can and that the margin is so large that investors generally are eagerly seeking a chance to put money into hydroelectric projects.

The second condition which vitally affects development is statutory. After ten years or more of discussion it has come to be generally agreed that our federal laws discourage the development of a large proportion of the nation's water powers, and remedial legislation has been considered at every session of Congress for many years. The legal obstacles are quite distinct and separate from the economic facts which have been previously described and are in addition thereto.

Of the estimated 55,000,000 undeveloped water horsepower in the entire country, approximately 40,000,000 is located within the boundaries of the thirteen so-called Western water-power states. In order to develop power in that section it is nearly always necessary to use some part of the public domain, if not for the dam site itself, at least for flowage, for transmission right-of-way or for some other purpose. Existing law forbids such use except under permit issued by the Secretary of the Interior and revocable without cause, at any time, by himself or his successor in office. As funds for hydroelectric development must come from private sources, the unstable tenure imposed by this condition has constituted so great a hazard of loss that the private investor has been loath to assume it. The unfortunate—almost disastrous—result has been practical stagnation in water-power development for many years. Many available power sites not in the Western states, or not on the public domain, are on navigable streams. For each such project a special act of Congress is necessary.

#### ENCOURAGEMENT OF WATER-POWER DEVELOPMENT

The Engineering Council does not consider itself expert in legal matters and will not undertake to discuss the relative merits of the different plans proposed to improve conditions. It should be pointed out, however, that a hydroelectric enterprise being once successfully established, it is alike to the interest of the owners, of the government and of the public that it should continue indefinitely without interruption. Further, there will never come a time when it may be said to have been completed and subject to no further expansion. This continuing growth makes burdensome and usually abortive any attempt to amortize the investment, while the investment in other water powers or in steam plants or both, interconnected with, and generally dependent for their economic operation on, the original development renders the right of the government to recapture that development only very onerous and one which constitutes a serious impediment to the free and full development of an enterprise which is otherwise most desirable from all standpoints. With respect to power sites on the public domain and on navigable streams the government is in the position of seeking to have its resources developed without assuming any business hazard and without contributing either capital or credit. It would be unfortunate, in the light of past experience, if any new laws which may be enacted should put the government in the position of bargaining with capital and of offering just sufficient incentive not to induce capital to undertake the developments desired, thereby, while apparently providing a remedy, in reality assuring a continuance of the present undesirable condition. Hydroelectric enterprises must compete with the demands of other industries for capital.



# Philadelphia Partnership Plan Shows Foresight

**New Contract for Unified Operation of City High-Speed Lines and P. R. T. System Provides for 5 Per Cent Return on Stock, Protected by Adjustable Fare—Places Company and City Investments Side by Side—Recognizes Authority of State Commission**

The lease which has just been approved by the city of Philadelphia for the operation of new city-owned rapid transit lines by the Philadelphia Rapid Transit Company is worthy of notice not only because it is an important addition to the list of partnership agreements in this country but also because it has several decidedly novel features. The novelty lies not so much in mere details as in the various fundamentals of the new contract. The lease definitely recognizes these three principles: 1. Such unified service as the people desire should be furnished at a minimum cost. 2. The cost of this service should be met by the car riders. 3. The authority of the Public Service Commission to regulate service and fares should be fully recognized.

After two years of negotiation the new lease was approved by Councils and signed by the Mayor on Jan. 3. The only steps now remaining to be taken are the approval by the company's stockholders, who are to vote on the matter at a special meeting on Feb. 8, and approval by the Public Service Commission. The course of the negotiations and the various changes and different proposals made have been described in the *ELECTRIC RAILWAY JOURNAL* from time to time, and the present article will discuss only the main points of the latest and approved contract.

The lease contemplates the unified operation of the new city-owned rapid transit lines and the system of

the Philadelphia Rapid Transit Company. The city lines, authorized by Councils on July 20, 1916, include the Broad Street subway with branches, the Frankford elevated line, the Thirty-fifth Ward-Bustleton and Byberry surface line, the Darby elevated line, the Parkway-Northwest subway-elevated line and the delivery loop subway. The city system at present also includes the Chestnut Street subway, approved on April 2, 1917.

The company agrees to provide such additions to its system within Philadelphia as the Public Service Commission upon recommendation of the Supervising Board, later described, shall determine to be reasonable and necessary. The company waives any objection to the jurisdiction of the commission to issue orders in such matters, and it agrees to obey any such order in the premises, or if the commission refuses to take jurisdiction, it will obey the recommendation of the Supervising Board and construct or procure the new property, subject only to its ability to sell securities upon terms approved by Councils.

It is anticipated that for several years the gross revenue of the unified system, with the exception of a comparatively small amount from the Frankford line, will be secured from the company's system. Even throughout the entire term of the contract, unless the city extends its system far beyond the lines now authorized, the greater part of the gross revenue will come from the operation of the company's system. It is estimated that the city's high-speed lines, as planned, will earn not more than 25 per cent of the gross earnings of the unified system.

The lease provides that the company, for the city-owned lines, shall furnish low-tension feeders, high-tension cables and other necessary appurtenances, power stations, telephones, lighting fixtures and wiring, station equipment and such shop tools, machinery and other miscellaneous items as may be specified by the Supervising Board. The city can supply facilities at the company's expense if the latter causes any delay. Furthermore, at the request of the city with the approval of Councils, the company may be required to furnish storage yards, shops, carhouses and real estate necessary therefor, and rolling stock for any individual operating section except the first section of the Frankford line, to the extent that the city is unable to complete such equipment owing to its lack of borrowing capacity at the time.

It is provided, however, that the company shall do this if it can secure the money upon terms to be approved by Councils, and that the city shall, if it can legally do so, agree to purchase such equipment at cost out of the first money it can borrow for transit facilities. The company's investment under this provision is limited to \$3,000,000 for any one individual operating section, it being necessary to retire the investment in any one section before the company can be called upon

*(Continued from page 178)*

Experience has shown that even without the imposition of additional financial burdens many of them are not sufficiently attractive to secure development, and as the attractive prospects grade by imperceptible degrees into the unattractive ones, it is perhaps self-evident that every additional burden, however small, transfers a percentage of such projects from commercial into uncommercial prospects,

It is our belief that the benefits afforded the communities served by cheap power, and to the nation by the conservation of coal resulting from the substitution of a self-renewing for a non-renewable natural resource are far more valuable than is the exact solution of the question of restricting the returns to capital to their irreducible minimum. The present emergency due to the progress of the war has forcibly illustrated the importance of having developed the greatest possible number of water powers as a source of industrial power supply. As it consumes no fuel, the substitution of water for steam power would release to other uses all the extensive railroad and water facilities now engaged in transporting coal. It would similarly release a corresponding volume of labor now occupied in mining this coal and in operating such transportation agencies as well and the boiler room forces of the steam-power plants themselves.



to furnish facilities in this manner for a subsequent section.

The method of procuring capital to meet the requirements for the expansion of the company's system, for refunding and other capital expenditures and for the transit facilities to be furnished to the city, the rate of interest or dividend and the program of amortization or retirement must be approved by Councils.

#### HOW GROSS REVENUE WILL BE USED

The gross revenue of the unified system will consist of the revenue from transportation and the revenue from operations other than transportation, including income from securities of underlying companies and all direct or indirect income from the operation of the system. Reports certified by the Supervising Board must be delivered to the City Controller for each quarter of the calendar year.

In outlining the disposition of the gross revenue, the lease provides for eight deductions, payment being in the order of the items. The first six items include (1) all expenses for operation and maintenance; (2) taxes; (3) existing fixed charges of the company; (4) interest, dividends and sinking fund payments on new securities of the company; (5) payments to the various depreciation reserve funds, and (6) payments to the city under the 1907 contract.

The balance is called the current net revenue, out of which items 7 and 8 must be paid, as follows:

"7. Payments to the city and the company in proportion to the relative investment of each equal to a return of 5 per cent per annum on such investment.

"8. Payment to the city equal to the difference between the payment to the city under item 7 and the gross amount of interest and sinking fund charges upon the city's investment."

The company's investment is fixed at the par value of its capital stock now authorized and issued, \$30,000,000, less any instalments remaining unpaid. The city's investment is to be computed under explicit provisions. The return on the investment in any individual operating section is not chargeable against current net revenue until one year from the date after operation begins.

#### PAYMENTS ARE TO BE CUMULATIVE

The payments under the various items are cumulative in the order of the items, except that a deficit in former years under item 7—the 5 per cent return on the investments of the city and the company—must be made up before a deficit under the preceding item, covering payments made to the city under the 1907 contract. It is important to note, however, that a deficit under an item does not occur until after the application of all the current gross revenue, all the new surplus and \$2,000,000 of the initial surplus.

#### HOW THE INITIAL SURPLUS AND NEW SURPLUS WILL BE USED

The "initial surplus" is the accumulated surplus of the company when the contract becomes effective. When payments under all the eight items referred to above are made, any surplus remaining is called "new surplus." The accumulation of the new surplus is made in order to provide an equalizing fund for stabilizing fares and assuring future payments as provided.

The disposition of these surplus funds is provided as follows:

"If, in any year, the gross revenue shall not be sufficient to provide in full for all the deductions and payments specified, the new surplus shall be applied to the deficit in the order of the items and to the extent it may be necessary to make full payments thereof, and thereafter the company's available initial surplus to the extent of \$2,000,000 shall be applied to any remaining deficit in the same manner."

It is, however, stipulated that in the case of the destruction of or serious damage to a substantial part of the unified system, or a continuous interruption of normal operation resulting in suspension or curtailment of payments under the last four items in the schedule, the company shall not be required to make use of the initial surplus if this has been depleted \$500,000 or more and not restored. Nor shall the company at any time be required to make up any deficits occasioned by any of the above-mentioned causes by payments from initial surplus which will cause the total depletion of this to exceed \$500,000. The lease provides that it shall not be incumbent upon the Supervising Board to file a schedule of fares to make up for such deficits, and these shall not be made up unless the board shall sanction payments on their account out of after-acquired new surplus resulting from normal and reasonable fares.

In respect to the two surplus funds two points should be noted:

1. Neither the initial nor the new surplus can ever be used by the company in payment of any dividends in excess of 5 per cent per annum from the date on which the contract becomes effective.

2. The new surplus accumulated under the contract can never be much in excess of \$2,000,000, because when it reaches that sum fares are adjusted downward.

#### RATE OF FARE IS FLEXIBLE

The new lease provides for an adjustable fare. The initial fare is 5 cents, with universal free transfers. The company is not obliged to issue a transfer on a transfer on the surface lines, except where the use of a high-speed line intervenes. The 3-cent exchange tickets are to be abolished outside the delivery district around the City Hall within sixty days of the effective date of the contract and inside of this district on the initial operation of the first section of the Frankford line.

It is expressly stated in the contract that the understanding of the parties in the making of the agreement is that "the fares shall be such as will provide current net revenue sufficient for a cumulative return of 5 per cent upon the company's capital stock and 5 per cent upon the city's investment, and the cumulative payments under item 8."

The lease stipulates that in case at any time there is a shortage of current net revenue for the designated payments and the new surplus is exhausted and the initial surplus depleted to the extent of \$500,000, there shall be such a revision of fares upwards as will produce gross revenue sufficient to meet all requirements and make up within a reasonable time the initial surplus and any deficit in payments of various items in former years.

Within thirty days after the initial surplus at any



time has been depleted to the extent of \$500,000, the Supervising Board is required to prepare and file with the Public Service Commission a schedule of "fares and charges," which, in its opinion, will produce the necessary amount of gross revenue.

Whenever the result of operation for two successive quarterly periods under any new schedule revising fares upward fails to produce sufficient gross revenue to meet all requirements and a surplus over and above the current payments of items 1 to 8 inclusive at such rate as will make up within a reasonable time the initial surplus and any shortage in payments of various items in former years; or, whenever at any time after the initial surplus has been restored it becomes again depleted to the extent of \$500,000 in making up current payments, the Supervising Board must within thirty days prepare and file with the commission a new schedule of fares and charges effective within thirty days.

Furthermore, should the results for any year during which there has been added any individual operating section indicate to the board that the existing schedule of fares will not produce sufficient revenue to meet the requirements when the cost of this individual operating section is entitled to a return under the lease, the board may in anticipation file a new schedule of fares and charges to take effect on the date when such cost will be entitled to a return.

There is one contingency under which the company may withhold payments under the 1907 contract to the extent necessary to pay the city's interest and sinking fund charges and the company's dividends. If the Supervising Board files a schedule increasing fares under the public service company law, the fares go into effect in thirty days. If for any reason the new fares do not become effective within this period or are suspended, the company may, until rates are effective sufficient to meet the requirements, suspend its current payments to the city under the 1907 contract to such an extent as may be necessary to make the net revenue sufficient to meet the current payments under items 5, 7 and 8.

#### REVISION OF FARES DOWNWARD

Under the lease the fares must be revised downward whenever the reports for two consecutive years show a surplus increasing in a substantial amount annually and equalling or exceeding at the time \$2,000,000.

The change of fare is to be effected in this manner. The Supervising Board must, within thirty days after the amount of the new surplus and the increasing tendency have been shown by the reports, prepare and file with the commission a schedule of fares and charges which will reduce the gross revenue. This must be done, however, without impairing the ability of the company to meet the first eight items out of the current gross revenue after the application to the items in each year of not exceeding one-third of the new surplus accumulated at the time of the filing of the schedule. Any schedule so filed shall take effect within thirty days.

It is possible, however, for the city to reduce its rental for the high-speed lines and thus bring about a reduction in the fare. The rental payable to the city is the amount of the interest and sinking fund charges on the bonds issued to acquire its transit facilities. The city reserves the right to determine "what portion

of the interest and sinking fund charges on its investment in transit facilities shall be borne by the car rider and what portion shall be borne by the taxpayer," and it may from time to time by ordinance specify that "any or all of the city's investment in the transit facilities shall be withdrawn from the rental requirements under the contract." If the city thus withdraws any portion and the results of operation in the preceding year indicate to the board that the existing schedule of fares will produce more revenue than necessary, the board must prepare and file a schedule of fares and charges to reduce the gross revenue accordingly, though not below the point necessary to meet the other requirements.

#### DEPRECIATION RESERVE FUNDS AUTHORIZED

The lease provides for three separate depreciation reserve funds to be set aside out of gross revenue quarterly in amounts and according to a classification to be determined from time to time by the Supervising Board. These funds are for: (1) The city's transit facilities; (2) the transit facilities furnished by the company for the city, and (3) the company's system.

The company's present reserve is to be funded, if not so now, for the last one. The first payment into that portion of Fund 1 which shall be set aside for permanent structures of the city's system is to be made ten years after the date upon which such facilities are first operated, and at no time is the annual appropriation to this portion of the fund to exceed one-half of 1 per cent of the cost. The first two funds will be in the control of the board, the latter in the custody of the company. Investment of funds not currently needed is subject to the approval of the board.

#### RIGHT OF RECAPTURE RESERVED

The new lease will expire on July 1, 1957. Upon six months' notice the contract can be renewed for successive periods of ten years. After July 1, 1927, however, the city may upon six months' notice recapture its own property and acquire all of the company's property by paying to the company a sum equal to the amount paid in upon its outstanding capital stock, the dividends on new capital stock unpaid and the accumulated unpaid portion of the protected 5 per cent dividend, and by assuming all due and accruing current liabilities of the company.

If the city dissolves the unified system at the expiration of the lease in 1957, it must pay to the company the original cost of the facilities furnished by the latter, less any repaid or amortized amounts. Under this condition the initial surplus would be retained by the company and the new surplus would be prorated according to the respective investments in the unified system.

#### ORGANIZATION OF THE SUPERVISING BOARD

The unified system is to be under the control of a Supervising Board, consisting of three members. The city's representative is the director of the Department of City Transit. The company's representative may be appointed from time to time and be removed at the option of the company. The chairman of the board is to be appointed for four years by the Mayor and the president of the company. He can be removed at any time by joint action of these two officers.

If the Mayor and the president fail to agree upon a



# Electric Railways Co-operate in Carrying Out Garfield Order

Telegraphic Reports as to Its Effect in a Number of Cities Are Reproduced Below

THE ELECTRIC RAILWAY JOURNAL arranged to receive by wire reports from a number of cities as to the effects upon the electric railways of the order of the United States Fuel Administrator restricting the consumption of fuel. These cities were selected on account of their relation to manufacturing or shipping activities, and it was not the intention to cover the country systematically. Abstracts of the telegrams received are given below, and information received directly from companies operating in New York City is included:

## *Boston, Mass.*

On Friday, Jan. 18, the revenue of the Boston Elevated Railway was less than on normal Fridays, service being in about the usual volume. The Thursday and Friday power station load curves overlapped and there was no difference in coal consumption apparently due to industrial curtailment. On Monday a typical Sunday schedule was at first operated, but curtailment of suburban steam railroad service overburdened the lines on the west side of the city. This with heavy traffic caused by the theater patronage, all day and evening, forced considerable increase in service. This had the approval of Fuel Administrator Storrow, who gave electric railway managers throughout the State much latitude in carrying out the spirit of the Garfield order. It is doubtful if the company was able to save coal in view of the above-mentioned circumstances and of the exemption of many establishments. Employees were paid full wages, not a man losing compensation through curtailment.

The Bay State Street Railway furnished regular weekday service on Friday, Saturday and Tuesday with extra cars and some regular cars cut out on account of the closing of certain factories. On Monday a Sunday sched-

ule was operated on about two-thirds of the system. The saving in fuel is difficult to determine on account of the variation in the quality of coal. Thus on two recent days with the same service the consumption was 220 and 170 tons respectively. On one day ten boilers were required for the normal work of six.

## *Trenton, N. J.*

The first Monday under the Garfield fuel order caused a serious congestion on the trolley lines in and near this city. More passengers were carried than on days when the usual number of cars are in service. The Trenton & Mercer County Traction Corporation established a Sunday service for that day and operated with 30 per cent fewer cars. Seventeen trailers and thirteen regular cars were taken from the service. The New Jersey & Pennsylvania Traction Company, which runs fewer cars in winter, only removed one car from the Morrisville, Pa., line. The Public Service Railroad Company curtailed service on the Trenton-Newark and Trenton-Camden divisions. On account of a shutdown of all the plants and the keeping open of the theaters the traffic was greatly increased and the electric railway companies had difficulty in handling the crowds during the afternoon and early evening. For that day the Trenton & Mercer County Traction Corporation adopted a new method of collecting fares and saving time in loading the cars. Some of the passengers were allowed to enter by the front door and the motormen, who were provided with change, collected the fares and later turned them over to the conductors. There was considerable discomfort in riding in the congested cars.

## *Louisville, Ky.*

A normal Sunday mileage served fairly well to meet all the demands on the Louisville Railway on Monday. Several large industrial plants continued in operation but were taken care of, Sunday headway being established on week-

(Concluded from page 181)

chairman, the duties of the board are to be performed by the two members. In case any question arises on which they differ, they may agree upon a temporary arbitrator. If they fail to agree, either may, on five days' notice to the other, apply to the commission, which shall then make the appointment.

The board has a supervisory power over the service of the company. This power is conferred as follows: "To pass upon, adopt and alter, from time to time as may be necessary, rules and standards as to maintenance, service, routing, adequacy and suitability of equipment as in its opinion may be necessary or appropriate for securing to the people the best practicable transportation service." The board also has the power to approve power contracts and contracts for advertising privileges, and it may establish and change stations and stopping points. It has the power to approve plans and specifications and to inspect work and materials. It cannot, however, alter or postpone the construction of any line authorized by vote of the people or by Councils. Under the lease, it may be added, the company, under such restrictions as the city may impose,

may carry or be required to carry freight, mail, express and other unobjectionable matter, provided this does not interfere with passenger transportation.

It is provided that the company has a right of appeal to the Public Service Commission from orders of the Supervising Board, but it must obey the order of the board pending the appeal. The board has no power which is vested by law in the director of the Department of City Transit or the Public Service Commission. This is clearly set forth in the following language:

"Nothing in this article shall deprive the company's officers and directors from the management of the property, nor shall anything herein be deemed a delegation to the board of any power vested by law in the director or the commission. It is the intention of this contract to enable rules and regulations for governing maintenance and service to be made and complaints and petitions of patrons to be heard more expeditiously than by original application to the commission; but nothing herein shall prevent any person from bringing before the commission in the first instance any matter within its jurisdiction."



day time. Between 6 and 8 a. m. Sunday service was increased by extra cars with normal service to noon, and a curtailed Sunday service until 5.30, with a supplemented service for the next half hour. After 6 o'clock the normal Sunday time was observed.

People generally appear to have remained at home, although there was some crowding in the early afternoon. Public schools were dismissed for the week on account of weather and fuel conditions, and this traffic was lacking. Theater-going crowds were comparable to Sunday afternoon crowds. Monday morning saw new zero temperature which tended further to keep people at home, and receipts showed 5 per cent reduction from Sunday, Jan. 20.

#### *St. Louis, Mo., and East St. Louis, Ill.*

Electric railways in St. Louis were not much affected by the Garfield order. They operated on regular schedule, as there was not a 5-day suspension of business on the west side of the Mississippi River. However, as the State Fuel Administrator does not allow business to begin before 7 a. m. nor to continue after 7 p. m. the traffic before and after these hours is very light. The East St. Louis & Suburban was ordered to operate on a Sunday schedule. General Manager Parsons on Tuesday wired G. E. Williams, Illinois State Fuel Administrator at Chicago, that while the railway company was in accord with the order it must operate its service to accommodate workmen to and from exempted plants, such as packing houses and mines. For that reason regular daily service was necessary. He asked permission to do this and Mr. Williams replied that Mr. Parsons must use his own best judgment and give the service required. Owing to snowstorms and zero weather that prevailed many cars of this company were out of service, but with moderating weather they are now operating better.

#### *Chicago, Ill.*

In this city the several roads were affected in a similar manner as follows: The elevated roads ran a normal schedule on all days except Monday, and a holiday schedule on this day with provision for small peaks. The Monday traffic was greater than that of a normal Sunday, which is about 60 per cent of a usual week day. The surface lines started on Monday on a holiday schedule but had to add cars due to an unexpected demand. This will be rectified next Monday. The Chicago & North Shore ran a holiday schedule on Monday, with normal service other days. The Chicago & West Towns reduced service on Monday to slightly less than Sunday schedule and could have used more cars to advantage at some points.

#### *Indianapolis, Ind.*

Owing to unprecedented snowstorms and extreme cold during the past two weeks all street railway travel in this city has been below normal. Approximately regular Sunday schedules were operated on Monday except that extra cars were used morning and night to take care of employees of some factories working on government orders. Travel during the day was about equal to usual Sunday travel under similar weather conditions. The extreme cold weather and the closing of all theaters, picture shows, saloons, etc., for several days last week by the local fuel administrator has tended to keep the people at home.

#### *Cleveland, Ohio.*

The Cleveland Railway operated under definite order from the Fuel Administration to maintain Sunday schedules only on Monday and it obeyed the order explicitly. However, forty large manufacturing industries were exempted from the closing order without notice to the railway and thousands of workmen found it impossible to board cars in the morning. They were left standing at the corners, and eventually they reached their places of employment. They found the same conditions on the return trip in the evening, as additional cars could not be furnished. In addition thousands of men went to cold offices to look over their mail and others took advantage of the opportunity to visit, thus putting up to the railway a burden that was not expected. Big crowds gathered at every important stop, and in some instances crews were threatened when they passed the stops with cars already heavily loaded. In one place the trolley wheel was pulled from

the wire in an attempt to prevent a car from proceeding. All theaters did a big business but the people found no extra cars to carry them home in the evening. The crowds were fairly well cleared by 6.30 p. m. with the regular cars, since the Sunday schedule provides for many more cars in the afternoon than in the morning. The use of this schedule resulted in confusion in many places and railway officials had their hands full in taking care of the work. The company has received permission to furnish a sufficient number of cars next Monday in addition to regular cars to carry workmen to and from exempted factories.

#### *Buffalo, N. Y.*

With the exception of providing usual tripper extras for more than 35,000 employees of war industries exempted by the Garfield order the International Railway maintained a curtailed week-day schedule of cars on all local lines on Monday. The interurban schedule on the Niagara Falls, Lockport, Olcott and Lancaster divisions remained unchanged. About 85 per cent of the regular week-day service of regular runs was given, but no tripper extras were sent from the carhouses for the usual evening rush period. Almost a score of the largest industries which are working almost exclusively on government orders worked full time, and there was no change in the service provided for these employees. The Buffalo & Lake Erie Traction Company maintained a slightly curtailed week-day schedule with the exception of providing usual extras for employees of the Lackawanna Steel Company.

#### *New York City*

The Interborough Rapid Transit Company on Monday saved about 600 tons of coal by strict application of the order. The Sunday mileage was furnished on Monday, and it was distributed so as to correspond with the expected density of traffic. Taking the elevated, subway and surface lines together, the mileage operated was from 70 to 75 per cent of the usual week-day mileage.

The Third Avenue Railway ran about 80 per cent of normal mileage on Monday, and the fuel saving was proportionate to the reduction in service. The traffic was handled without difficulty, although there was congestion because the demand for service was not reduced appreciably.

The Brooklyn Rapid Transit Company ran about 20 per cent less than regular week-day service on Monday, spacing the cars with special reference to the theater crowds. Everything went smoothly with the exception of the crowding of a few cars in the evening rush. The traffic was somewhat heavier than on an ordinary Sunday.

## Furnace Savings at Portland

THE Cumberland County Power & Light Company, Portland, Me., has posted the following notice in the boiler rooms of its power stations:

### SAVE COAL

#### Why

The President requests it.  
Saving is both necessary and fashionable.  
Economy means efficiency, which spells victory.  
Every shovel of coal (20 lb.) is worth 10 cents, the war price of a loaf of bread.

#### How

Heat only the space actually used, but do not sacrifice ventilation.

Accustom yourself to a room temperature below 70 deg. Use a thermometer.

Start with a clean heater free from air cracks, a whole grate that shakes well and a well-insulated heater and pipes.

Keep a deep fire; shake down the ashes only as the draft makes it necessary. Use chimney cold air inlet and smoke pipe damper to reduce draft. Opening the fire door chills the fire and the heater.

Gas from freshly fired coal should be burned by leaving a small portion of fire exposed.

Clean all heating surfaces thoroughly every week and keep the ash pit empty.

*Issued to all our employees to aid them in supporting the work of our fuel administrator.*

CUMBERLAND COUNTY POWER AND LIGHT COMPANY.

Hang Up by the Furnace



# Six-Cent Fare Granted to Portland Line

Oregon Commission Meets Imperative Need of Company Due to Increased Costs—Refuses Petition of City to Suspend Increase Pending Litigation, but Authorizes Excess Fare Receipts with Tickets

FINDING that the present revenues of the Portland Railway, Light & Power Company are inadequate and that the practices and economies begun under a recent order are not productive of a sufficient return to protect the integrity of the company, the Oregon Public Service Commission has authorized a 6-cent fare for the company, effective Jan. 15. This method of fare increase for Portland the commission prefers to a zone system or a transfer charge.

The company applied for a 6-cent fare on Sept. 6, 1917, and on Oct. 5, 1917, received partial relief. The commission, as described in the *ELECTRIC RAILWAY JOURNAL* of Oct. 27, authorized an increase in rates for unlimited tickets and limited school-children's tickets, and it gave moral support to the ideas of relief from taxation, commission recognition of wage demands, public co-operation in spreading rush-hour traffic, and one-man car operation.

The commission announced that it would keep in touch with the company's operations and take any further action deemed necessary. The report of the company for the period from Oct. 15 to Nov. 30 having been filed, supplemental hearings were held, at which it was shown that the remedies proposed by the commission had resulted in an increase of net revenue of \$20,000 per month. The extent to which the utility had been able to comply with the order and suggestions of the commission were discussed separately. The results, as stated by the commission, are shown in the following paragraphs.

## COMPLIANCE WITH PREVIOUS ORDER

Following the issuance of the commission's order, the company resumed wage negotiations with its employees, the parties meeting in a commendable spirit of fairness and moderation and finally entering into an agreement for arbitration. The result was the granting of the demands of the men in full, but with the right reserved to the company to set aside the award, if the commission should not, by Jan. 1, 1918, grant sufficient increase of rates to enable it to pay the new scale of wages. The men now, the commission says, express entire satisfaction with both hours and pay.

The company requested from the Council an explanation as to its power and inclination to remove the unjust public burdens. In reply there was presented to the commission a copy of an opinion of the city attorney directed to the Council and dated Oct. 29, 1917, in which the city attorney held that relief from the burdens of hard surface paving and maintenance thereof and also from bridge tolls can only be granted by an amendment to the charter.

Considerable progress, the commission notes, was made in the spreading of peak loads by changes in the hours of beginning and quitting work in large industrial establishments, but much remains to be done. Office employees and professional men may also vary

their hours in some degree so as to avoid traveling at times when the cars are crowded with those in other occupations.

In the matter of operating one-man cars, it is said, the company feels that under the conditions prevailing in Portland considerations of safety prevent this idea being put into effect, except to a very limited extent.

The first months of the fiscal year have shown a large increase in traffic over the previous year, but the rate of increase is falling off each month. Now at the end of the first half of the year it is evident that the actual increase will be very close to the estimated amount of 15 per cent over 1916-1917.

By a reduction of the number of cars on many lines, the average service in proportion to traffic being now somewhat less than in 1916-1917, a material saving in operating expenses has been effected.

The company's report for November covers the period when the curtailment of service recommended by the commission and the new wage scale of all employees were in effect. For five years the gross revenues for November have averaged 8.33 per cent of the total for the year. Assuming the same ratio for this year, the commission calculates a rate of return of 1¼ per cent on the value of the railway property. This return represents the total amount available for both interest and dividends.

In order to bring clearly before the public the relation of the commission to the situation still remaining, the commission describes its three functions as follows:

1. *Administrative*.—"The commission must see that the public gets what it pays for and no less. It must determine both the quality and the extent of the service to be rendered by the utility. Just rates cannot be established except with reference to definite standards of frequency and adequacy of service. In fixing these, the right medium must be found between service which is good, but more costly than the car rider can afford, and that which is cheap, but insufficient to meet his needs. The service must fit both the convenience and the pocketbook of the patron."

2. *Judicial*.—"The commission must see that the public pays for what it gets and no more. The rates charged must be reasonable to the consumer, and so far as this limitation will permit, the rate of return on investment must be fair to the utility. A rate of return which is fair and just for times of industrial stagnation may be entirely inadequate for periods of expansion. Even under fixed conditions these terms are indefinite; there are in every case both upper and lower limits within which any rate of charge or return is fair and reasonable. Within these limits the determination of rates cannot be based on considerations of justice alone."

3. *Financial*.—"If the rates fixed by the commission, while sufficiently high to escape condemnation by the



courts as confiscatory, yield only a return insufficient to attract capital into needed public service, it is the public and not the investor who will suffer. The commission cannot perform this function directly. If any commission should make a practise of enforcing rates which would not attract free capital, it is certain that the community would eventually lose more than it would gain."

Summing up, the commission says that in the consideration of any case justice, of course, takes precedence over profit, but within the limits of reasonableness the commission will be governed by considerations of public policy, bearing in mind the constant need for the investment of new capital in order that the public may be properly served.

Turning then to the case in hand, the commission states that if the Portland company is denied relief, it must inevitably go into the hands of a receiver, for on its interurban lines operating expenses equal receipts, and the earnings of the light and power department are insufficient to meet the bonded interest of the whole system or even to make a fair return upon the investment in that branch of the utility. The primary duty of the receiver would be to conserve the property, and the public would receive service only so far as the interests of the property would permit. Having no means at his command other than the revenue from operations, and no power to increase the fares without the consent of the commission, he would be compelled to cut the service to the point where receipts would equal expenses. Such a reduction of service, the commission asserts, would be intolerable. The commission believes that it would be derelict in its duty if it should refuse the proper amount of relief.

#### REDUCTION OF SERVICE CANNOT SOLVE PROBLEM

In discussing various methods of relief, the commission says that further curtailment of service has been suggested. At first thought this seems feasible. Operating expenses and bonded interest exceed receipts by only about 12 per cent. If this difference could be overcome, interest on the balance of the investment might wait for better times.

The commission calculates that any saving in cost of transportation must be made out of 81 per cent of the operating expenses. These are estimated at \$2,349,700, excluding deferred maintenance, taxes and depreciation. Of this 81 per cent, or \$1,903,300, will vary with the amount of service.

An increase in net revenue of \$412,000 has been shown to be necessary to cover bonded interest alone. If this is all to be gained by reducing service, a reduction of 22 per cent would be needed. To cover 6 per cent interest on the entire investment of \$18,233,371, as determined by the commission, would require \$789,900 more net revenue, to gain which service must be

cut 41 per cent below the present standard. Such a reduction is said to be utterly impracticable.

Nor would the cost of service be less if the city should take over the system and operate it. With the present service and equal efficiency of management, the operating expenses would be the same as at present, while power instead of being furnished as now at cost would have to be paid for at commercial rates.

Under condemnation, it is not likely that the property could be bought for any less than the commission's valuation, and if the courts took account of the present scale of prices, of materials and labor, the cost would be increased at least 25 per cent. Money for such purpose could not be obtained for less than 6 per cent, so that the interest charge would be at least as large as now.

Under city management service could be maintained only by a resort to one or more of the following expedients: Reducing service, cutting wages, raising fares or making up the deficit by taxation.

If the zone system were adopted in Portland, it would permit low rates to be maintained in a great part of the city and would compel the long and now unprofitable lines to pay at least the cost of operation. It would also enable the company to meet jitney competition by making low but still profitable rates on the lines of heavy traffic, where alone the jitneys operate.

The commission believes, however, that the adoption of the zone system is inexpedient at this time.

It is estimated, from a study of traffic records for November, 1917, that one-fourth of the travel originates more than 3½ miles from the center of the city. If this distance be adopted as the zone boundary, and a transfer charge added, the additional rate for each zone necessary to make up the deficiency in revenue will be 2 cents. Many riders would thus be compelled to pay 9 cents and some 11 in place of the present single fare. The resulting disturbance in property and rental values would be very great. Many working people would find it necessary to give up their homes in distant suburbs and live nearer their work.

The commission alleges that the satisfactory results of the zone system in European cities are largely due to the fact that there the rich live at a distance and the poor in tenement districts at the heart of the city. In Portland the working classes live at the greatest distances and the extra charges of the zone system would fall almost entirely on them. While the effects of the additional cost of transportation would not alone be sufficient to bring about the formation of a slum district, it would, joined with other causes, tend to do so, and the resultant injury to comfort, health and safety would more than offset the advantages of an ideal system of imposing charges.

Closely connected with the zone system, the commission observes, is the idea of a charge for transfers. There are now about 22,000,000 transfers used per

### A Few Pointed Remarks

**I**T is time for the public to realize that the powers conferred upon public service commissions, thoroughly tested and upheld by the courts, are ample for the protection of the public against all the evils from which they have suffered in the past.

It is time, also, to realize that good service can be obtained only by just and equitable treatment. No starved horse ever pulled a heavy load.

The utilities have been deprived of the power to make unjust profits. They must also be protected against unjust losses.

If a utility is driven into a position where its credit is impaired and it can obtain money for operations and extensions only at unreasonable cost, the public must share the loss.—OREGON PUBLIC SERVICE COMMISSION.



year in Portland. It would require a 4-cent charge on this number to produce the revenue now needed, in addition to the 5-cent fare, but such charge would result in a very great reduction in the use of transfers, making it necessary to raise the price to at least 5 cents, which would be equivalent to abolishing transfers entirely.

The commission states that it hopes to bring about a state of affairs wherein the interests of all shall be properly guarded. The employees are now well cared for. Whenever the revenues reach an amount sufficient to give the owners the minimum fair return on their investment, it will be the policy of this commission so to regulate rates that, with the co-operation of the company, any further profits may be equally divided between the three parties, the employees receiving more wages, the company more revenue and the public better or cheaper service. Efficient management will then be rewarded by increased dividends, and faithful service by higher wages, while the public will profit from both by reduced fares.

#### SIX-CENT FARE AUTHORIZED

The commission concludes as follows:

1. The practices and economies inaugurated by the utility, pursuant to the former order of the commission, are not productive of an adequate return to protect the integrity of the company.

2. The present revenues derived by the utility from the operation of its railway system are inadequate.

3. The service now afforded is not in excess of the reasonable requirements of the traffic handled.

4. The rates charged and collected as cash fares and for unlimited ticket books are unjust, unreasonable and inadequate.

5. Just, reasonable and adequate rates, effective Jan. 15, are:

Cash fares, 6 cents each.

Unlimited tickets, five tickets for 30 cents, tickets to be on sale by all conductors.

Unlimited tickets in books, fifty tickets for \$2.75.

Limited school children's tickets, 4 cents each.

All tickets and cash fares shall include transfer privileges.

#### COMMISSION DENIES SUSPENSION OF ITS ORDER

The commission on Jan. 14 denied the petition of the city of Portland asking that the 6-cent fare order be suspended, or its operation postponed pending litigation in the courts. The commission, however, carried out the suggestion of Commissioner Corey that receipt slips be attached to tickets sold by the company, these receipts to be redeemed for the amount of the excess fare charged, in event the courts declare the order invalid.

The order says in part:

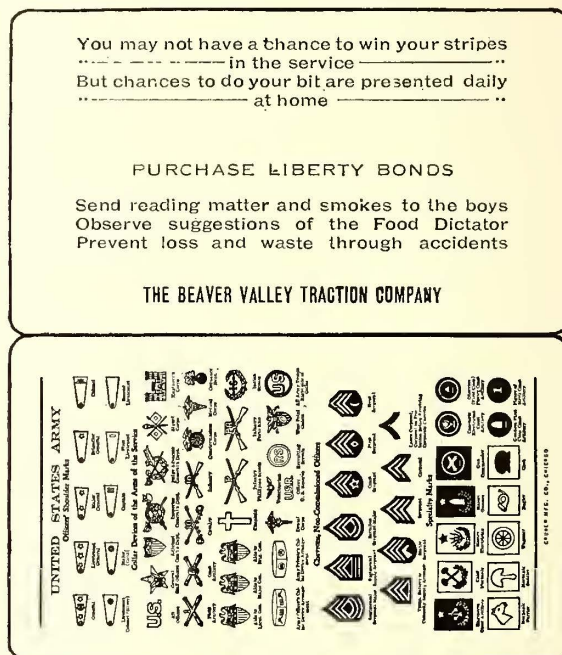
"Our investigation discloses that the need for additional revenue is imperative and cannot be delayed without serious consequences.

"If the effective date of our order be postponed until the matter is finally determined by the courts, the incentive for speedy action will be removed and the case might be allowed to drag along indefinitely, depriving the company of much needed revenue.

## Pointed Hints—and Useful Data

THE Beaver Valley Traction Company, New Brighton, Pa., has just issued to its patrons some cleverly devised celluloid cards, 2 $\frac{3}{8}$  in. x 4 $\frac{1}{8}$  in. One of the cards is reproduced herewith.

The front of the card reminds patrons that although they may not have a chance to win their stripes in the service, there are chances for them to do their share at home. Then follow these pointed suggestions: "Purchase Liberty bonds. Send reading matter and smokes to the boys. Observe suggestions of the food dictator. Prevent loss and waste through accidents."



FRONT AND BACK VIEWS OF PATRIOTIC CARDS BEARING TIMELY SUGGESTIONS AND INFORMATION

The reverse side of the card contains the various insignia of the United States Army—information of great interest to those who have friends or relatives in the service and to laymen generally. Small reproductions are made of the shoulder marks for officers, collar devices, the chevrons for non-commissioned officers and the various specialty marks.

## Union Scale of Wages and Hours

THE union scales of wages and hours of labor for 101 of the principal trades in forty-eight of the leading cities in the United States prevailing in May, 1916, are published in Bulletin 214, just issued by the bureau of labor statistics of the United States Department of Labor.

Reports of weekly wages were received from ninety-nine trades. In eighty of these the average rate of wages, taken collectively, was higher on May 15, 1916, than on May 1, 1915. In nineteen trades there was no change, and in no trade was the average rate lower. As regards the rates of wages per hour, as distinguished from rates per week, eighty-three trades showed an increase, eighteen showed no change, and for none was the rate lower. Taken collectively, rates per hour in 1916 were 4 per cent higher than in 1915, 5 per cent higher than in 1914, 14 per cent higher than in 1910, and 19 per cent higher than in 1907.



# American Association News

*War Board Work Summarized in Pamphlet Form.*

*Dr. Conway Presents Data Showing How Electric Railway Profits Have Decreased in Recent Years.*

## Work of War Board Reviewed

THE New York Electric Railway Association has reprinted in pamphlet form the address which Director Allen gave at a meeting of executives of the association on Dec. 13 on the work of the War Board. It outlines, among other things, the program for fuel saving on the Washington (D. C.) lines recommended by the fuel conservation committee of the Electric Railway War Board. This includes staggered hours of opening and closing some of the departments, skip stops, reduction of heating in rush hours, co-operation by the platform men, etc. This report was to be reviewed by the engineering committee of the National Research

Council, of which Dr. Durand, Gano Dunn and L. B. Stillwell are members, and then submitted to Dr. Garfield. It also says that similar studies were to be made in Baltimore and Cleveland.

## Some Diagrams Showing the Need for Higher Fares

BEFORE the Connecticut Company section on Jan. 15 Dr. Thomas Conway, Jr., summarized the present economic status of the electric railway industry. This was done for the purpose of furnishing ammunition to the employees for use in discussing with the public the need of the company for higher fares. A brief report of the meeting was printed in last week's issue of this paper. This week a number of diagrams selected from those shown on the screen by the speaker are reproduced. These diagrams make graphic a situation already quite familiar, which has been covered from all angles in many articles in the JOURNAL. It is convenient, however, to have them in form for easy reference, and their publication is timely, as they were prepared for use in the higher fare case pending at Hartford, Conn. The diagrams tell their own story.

In introducing the diagrams Dr. Conway reminded his hearers that in appealing for protection of electric railway interests it is not only the investment for

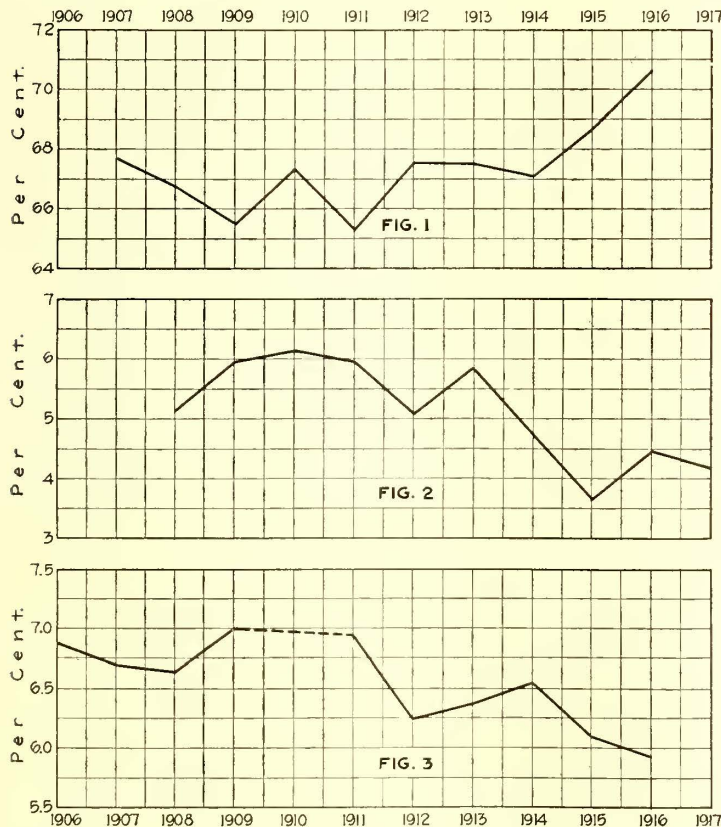


Fig. 1—Ratio of Operating Expenses to Gross Earnings of Massachusetts Electric Railways from 1907 to 1916

Fig. 2—Net Earnings of the Rhode Island Company from 1908 to 1917 in Percentage of Reproduction Value

Fig. 3—Net Earnings Per Mile of Track from 1906 to 1916 in Percentage of Cost of Main Track of Massachusetts Railways

Fig. 4—Margin of Safety of Bonds of Twenty-seven Companies in New York State Petitioning for Higher Fares and for All Electric Railways in the Second Public Service District. Roads included in Both Cases Are Those Having Bonds Outstanding

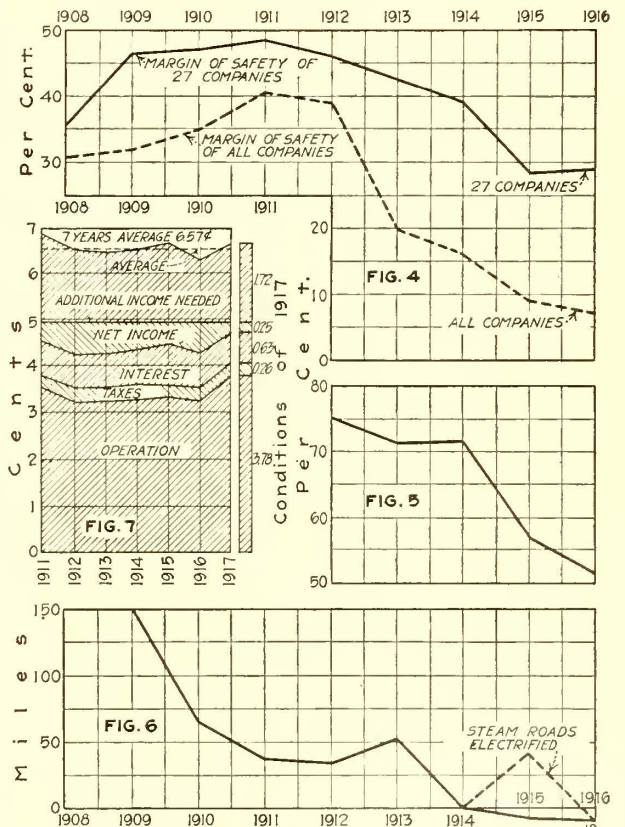


Fig. 5—Comparison of Margin of Safety for Funded Debt of Massachusetts Electric Railways from 1912 to 1916

Fig. 6—New Electric Railway Mileage Put Into Operation in Each Year from 1909 to 1916 in the Second Public Service District of New York

Fig. 7—Chart Showing Average Rate of Fare Per Passenger Which Would Have Been Necessary to Cover Operating Expenses, Taxes and 8 Per Cent Upon the Book Value of the Property Used and Useful in Railway Service, Connecticut Company, 1911 to 1917



## Publicity Fermenting in the Electric Railway Situation

Recent Instances Are Quoted to Prove This Statement  
—Commissions and Newspapers Are Beginning to  
Recognize Serious Condition of Railways

BY IVY LEE

THE policy of full publicity for things relating to the electric railways is proving itself. It is having a most noteworthy effect in expressions of fair-mindedness toward the companies that not so many months ago were almost uniformly expressions of intolerance.

Public service commissions are becoming more and more appreciative of the real relationship of the public to public services. Recent evidences on this point are numerous. The latest manifestation is to be found in the opinion just rendered by Commissioner Travis H. Whitney of the First District of New York. While the important point in this opinion is its conclusion (as fully told in the columns of the JOURNAL last week) that the commission is without power to grant the petition of the New York & North Shore Traction Company for an increase of fare from 5 to 7 cents, it is of great interest to note that the commissioner does not stop there. Having stated, as one of the logical steps in the development of his opinion, that the company has fully established the necessity of a greater income and that the public service is threatened by a state of facts that condemns the company "to a slow but ignominious extinction," he then goes into a field he is not called upon, for the purpose of the decision, to explore. He discusses other ways of meeting the company's problem, moralizing in detail and at length on the responsibilities of the public.

Taking the North Shore case as typical, he boldly places a share of the responsibility for such instances on the shoulders of city and State authorities in having encompassed the railways with onerous restrictions certain, in time, to put the company and the public's service in jeopardy.

The up-State commission has been just as frank in its acknowledgment of the true bearings of similar problems. Chairman Van Santvoord was, at first, frankly in line with the view that the commission had no power to raise street car fares above the maximum stipulated in its franchise, but just as frankly an-

(Concluded from page 187)

which protection is sought, but also the welfare of an enormous group of employees. This is a point which is often overlooked.

The public prejudice which employees are called upon to dispel is caused by conditions which have no bearing on the present situation. It is true that in the early days, under the inspiration of over-enthusiasm, roads were built which could never be profitable. Some were also built to sell. Due partly to the propaganda of muckraking magazines, an exaggerated idea of the profits of electric railways has become prevalent. There is a notion abroad also that the roads are greatly over-capitalized. Since 1907 public service commissions have been organized in forty-seven states. These will see that the capitalization of the railways is proper. The charts show the present situation with reference to income and actual costs.

nounced, in view of the public need, his change of viewpoint.

Commissioner Emmet took, as the foundation stone of his concurring opinion, the view that the public service is the paramount consideration.

The public press, too, shows a similar spirit. At first the up-State papers viewed coldly—to say the very least—the proposition of increasing fares. But when the companies had exhibited their figures, such journals as the *Syracuse Post-Standard* and *Utica Observer* led many others in agreeing that the companies—to preserve service, and that was the ruling consideration—must be relieved, if not by higher fares, then by charges for transfers or remission of franchise taxes, paving taxes, etc.

### OTHER INSTANCES FROM NEIGHBORING STATES

In Massachusetts the commission at first increased many fares, and later, on finding even the increase granted insufficient to meet the rising costs of operation, permitted the installation of zone systems. The action in Holyoke, Mass., is the latest in that respect. And the whole situation was intelligently reviewed and accepted by powerful Massachusetts papers.

In Trenton, N. J., Peter Witt, formerly street car commissioner of the city of Cleveland, when called in to report on the local traction situation, was expected, apparently, to put all the blame on the electric railway company. But, while making many suggestions for improvement of the company's service, he just as frankly reported to the City Commission that the responsibility of the city and the citizens of Trenton must be frankly recognized.

Peter Witt's blunt recognition of responsibility of the city's and citizen's interest in the welfare of the public's service cannot but have its effect far beyond Trenton's limits.

H. B. Weatherwax, vice-president of the United Traction Company of Albany, in an article recently printed in *The Commercial and Financial Chronicle*, says, in his review of public opinion as a result of a year's policy of publicity on the affairs of New York companies:

"The first idea was one of antagonism. The present idea is one of co-operation. . . . There is an enormously better appreciation of the facts bearing on the industry, both on the part of the public and on the part of public service commissions, not only in this State but throughout the country. . . . The present situation looks distinctly forward, not backward. A year ago this could not have been said."

Plainly, the policy of publicity is educating the public that its interests and the public's are one. The policy is proving itself.

### Electrification of Swiss Railways

The Administrative Council of the Swiss Federal Railways has decided to install electric traction in the near future upon the branch railway lines between Scherzlingen and Berne, and between Brigue and Sion; and for this purpose a credit of 9,700,000 francs has been voted.

The main reason given for the above step is the increasing scarcity of coal, which, according to a report of the railway directorates, threatens to become a real calamity for Switzerland.



# CONSTRUCTION, MAINTENANCE AND EQUIPMENT

ENGINEERS, MASTER MECHANICS AND OTHERS WHO HAVE DEVELOPED ECONOMICAL PRACTICES, OR WHO HAVE WORTH-WHILE IDEAS ARE INVITED TO TELL READERS OF THE JOURNAL ABOUT THEM IN THIS DEPARTMENT

## New 20-Ton Sand Car Built in Railway Shops

BY GEORGE C. TABER

Mechanical Engineer Union Street Railway, New Bedford, Mass.

THE Union Street Railway of New Bedford, Mass., has recently built in its own shops for local service a sand car of improved design, which is operated in connection with a 100-ton drying plant located at the Weld Street carhouse. The company owns sand banks 7 miles distant, and at present is hauling sand from this site in a 3-ton gasoline truck for storage and subsequent general use on the system. In the near future a steel flat car will be substituted in this service.

Upon being received at Weld Street the sand is elevated by Link Belt conveying equipment to bins on the second floor of the carhouse. From there it falls into the drier and thence to a receiving pit in the floor,

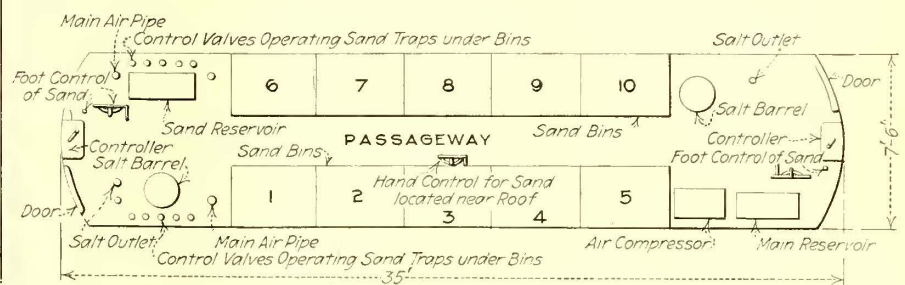
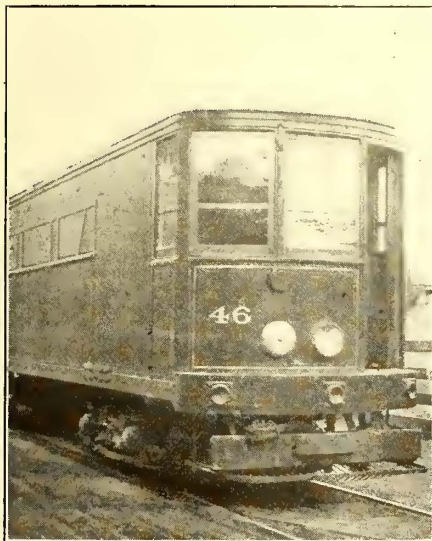
from which the dry sand is elevated by conveyor buckets to storage bins on the second floor level. Two spouts serve passenger cars

cable and a 4-in. x 6-in. x 8 ft. timber for use in emergencies, besides a number of small tools. The sand capacity of the car enables it to cover from 10 to 15 miles of track. For use at switches, frogs, etc., the car carries  $\frac{1}{2}$  ton of salt, which is scooped out of a storage barrel and discharged through a funnel upon the track as required.

The sand is stored within the car body in ten bins of 1-ton capacity each, the discharge being controlled by an air-operated valve, which facilitates sanding either track at the convenience of the operator. An automatic valve provides that the air pressure must rise to 50 lb. in the brake reservoir before any compressed air can be delivered into the air piping connected with the sand discharge valves. An air reservoir for sand valve operation is mounted beneath the roof of the car.

## Efficient Boilers from Scrap Pile

ON account of the rapidly increasing growth of business of the Little Rock Railway & Electric Company, it recently became necessary to enlarge the boiler capacity. Because of high material costs, it was decided to utilize some of the equipment in the plant of the Merchants Lighting Company, taken over in 1915. Among this equipment there were four 600 hp. Babcock & Wilcox boilers built for 2000-lb. operating pressure



END VIEW OF HOME-MADE SAND CAR AND SKETCH OF INTERIOR ARRANGEMENT

and the sand car from these bins as required. The drier is heated by steam coils connected with the carhouse boiler plant.

The new sand car is 35 ft. long over all and 7 $\frac{1}{2}$  ft. wide and is 12 $\frac{1}{2}$  ft. high from rail to trolley base. It has a semi-steel underframe and weighs about 20 tons light, with capacity for 10 tons additional. It is equipped with four Westinghouse 101-B motors and two standard 0-50 trucks with 33-in. wheels, truck centers 17 ft. and 4 ft. 6-in. wheelbase. End doors are provided for the crew, and on each side are three hinged doors, each 6 ft. long and 2 ft. wide, which can be fastened open when loading the car at the carhouse. A Mosher arc headlight, Westinghouse straight air brakes and Jones hand brakes and a Westinghouse A-5 air compressor are used. The car carries a 3-in. manilla

and two of these were moved to the plant of the Little Rock Company.

The installation was made with the boilers set at a sufficient height to provide a basement for handling the coal and in this basement was located three Buffalo Forge blowers direct connected to a Terry turbine. All the supports for these boilers were structural steel, each boiler being equipped with an individual stack 8 ft. in diameter by 150 ft. high with an individual hopper of 2-ton capacity. Coal is supplied and ashes are disposed of by means of carts and elevator.

The new equipment has proved exceedingly satisfactory, the boilers having been operated as high as 350 per cent rating. The use of blowers for these boilers, driven by Terry steam turbines, has also increased the temperature of the boiler feed water very materially.



## Welded Rail Joints

Reasons for the Increasing Popularity of Arc Welding for This Purpose—Details Regarding Recently Introduced Method Are Given

BY MARTIN SCHREIBER

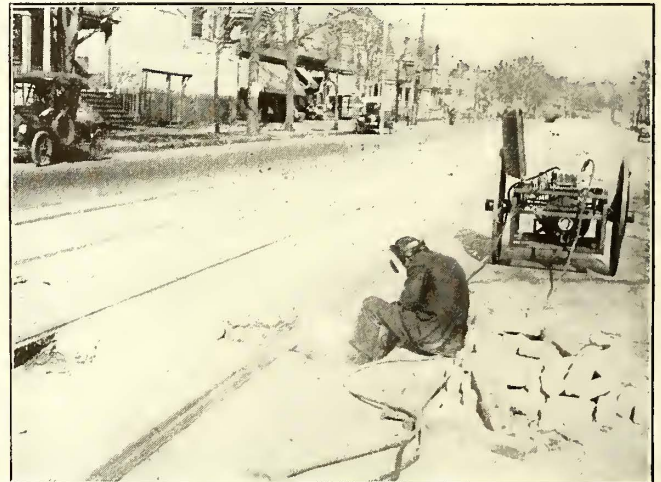
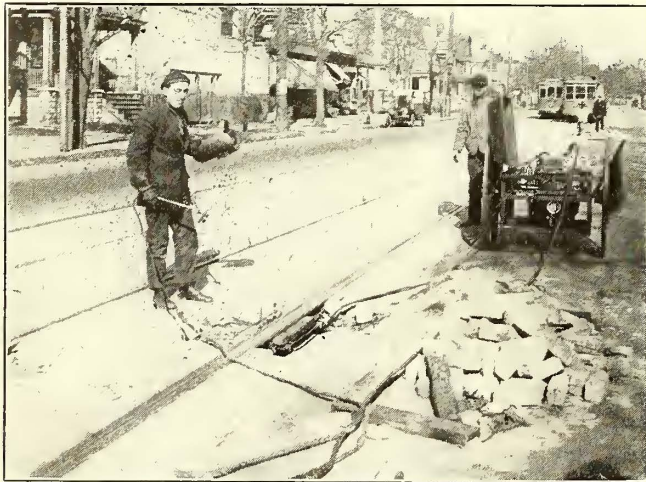
Chief Engineer Public Service Railway, Newark, N. J.

IT IS fairly well understood that joints, directly or indirectly, constitute the most important single item of construction and maintenance of electric railway track. Theoretically a properly welded joint has a decided advantage over a mechanical one, not only for giving a continuous rail for the operation of cars and a life presumably equal to the rail itself, but also an excellent return circuit for the electric current. These cardinal principles were recognized by track engineers over two decades ago. Then there was a general wave of interest in welded joints over the electric railway field, and many thousands of electric and cast welded joints were installed at that time. As with most new ideas, the first application of welded joints was doomed to failure. Any number of these welds broke soon after installation, or the rail ends cupped

welded joints was due to a variety of causes. The important ones were overheating and damaging of the metal in the rail ends, and failure to grind down the joint to a smooth surface after welding. Once the old troubles with the welding were thoroughly understood the faults were in a large way eradicated. The result was that the welded joints became popular.

Since 1908 the Public Service Railway alone has installed approximately 100,000 Lorain electrically welded joints, or joints for, say, 450 miles of single track. On the whole these joints have been satisfactory. Likewise a great many cast and thermit welds have been installed throughout the country with equal success.

In spite of the good results secured with the established methods of joint welding, the stress of these times in which greater efficiency and economy are demanded has caused many to give a great deal of thought to simplifying the present welding process. The object has been to find a method that will at least be as cheap and that can be applied under traffic. Back in 1909, with this thought uppermost in mind the writer caused certain experiments to be performed with the oxy-acetylene flame. Fig. 3 shows a piece of special



FIGS. 1 AND 2—ELECTRIC ARC WELDING OF TRACK JOINTS ON PUBLIC SERVICE RAILWAY

out so badly that it was necessary to cut out the joints and install short sections of rail, requiring two mechanical joints for each fracture. Otherwise the track had to be rebuilt and economical operation suspended.

So almost everyone who had anything to do with the installation of these joints was glad to be let alone long enough to get back to his "first love," the mechanical joint. There was then a vigorous revival of the mechanical joint. This, however, in spite of improvements and special designs that were introduced, was not perfected to a satisfactory degree. Even the joints with drilled holes and fitted bolts or rivets failed after a few years. And once a joint started to loosen and the rail ends moved, the deterioration of the rail ends was very rapid.

Long life of the joint is of the utmost importance. Joint repairs generally in these days involve expensive paving repairs, proper consideration of return circuit, and, incidentally, electrolysis cannot be overlooked. Electric railway engineers naturally turned again to the welded joint, appreciating that theoretically it is ideal, and that its failure in the past had been due to improper practical application. The failure of the

work that was broken, and how it was repaired and joined up with the existing track in Montgomery Street, Jersey City, by this method.

Since 1912 considerable progress has been made with electric arc welding of joints, and it is the purpose of this article to call attention to some actual work performed along this line in connection with track work of the Public Service Railway. The *ELECTRIC RAILWAY JOURNAL*, in the Sept. 1, 1917, issue, page 362, gave a description of some experimental combination electric arc welded and continuous joints installed in Newark, N. J. The performance of these joints is still under observation.

We have just completed the reconstruction of some 3000 ft. of track on Washington Avenue, Newark, where the new methods of the Atlantic Welding Company were adopted. The track was laid with new grooved girder section, Lorain No. 116-434 rail. The plates used were old channel bars, planed at top and bottom to facilitate welding, as shown in Fig. 4. The apparatus used at the joint is seen in Fig. 7. It includes a special composition bar clamped along the full length of the plate. This bar has a powerful controlling



effect on the arc and at the same time holds the welding metal in place, even when the actual weld occurs on a nearly vertical surface. The welding company claims basic patents on this feature. Suitable guide rods are attached to the joint apparatus, greatly facilitating the making of the weld, and the welder is able to secure fairly uniform results. The whole joint device is

head and base of the rail for the length of the joint. The necessary additional welding material is supplied in advance by laying a soft steel rod in the groove provided in the joint plate, as is clearly shown in Fig. 7. The amount of metal planed off the plate allows for the thorough and rapid fusing of the surfaces at that point, so the rod when welded in place fills the triangular

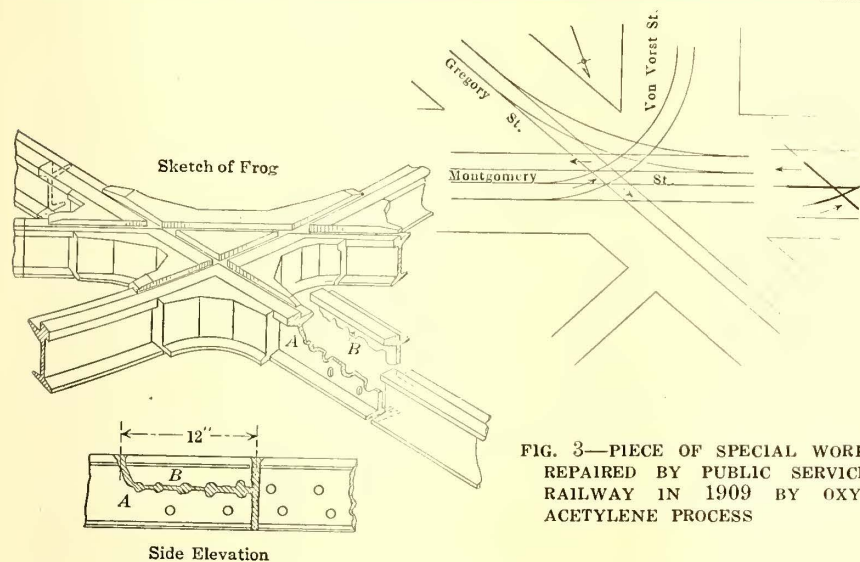


FIG. 3—PIECE OF SPECIAL WORK REPAIRED BY PUBLIC SERVICE RAILWAY IN 1909 BY OXY-ACETYLENE PROCESS

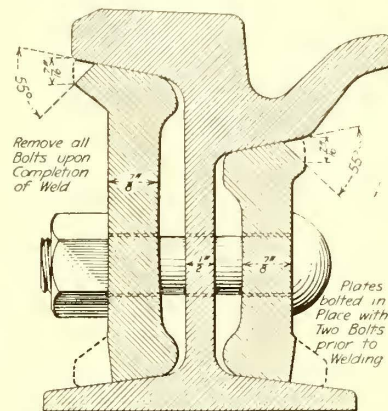


FIG. 4—CROSS-SECTION JOINT READY FOR ARC WELDING

clamped to the rail in place, and does not interfere with the operation of cars in any way.

A view of the welding generator is shown in Fig. 5. The machine is really a direct-current dynamotor that supplies a suitable welding current of about 350 amp. at 60 volts. The current taken from the trolley wire is approximately 38 amp. The outfit weighs only 1100 lb. and can be moved about conveniently by the two operators. It is supplied with a weatherproof case that can be seen in Fig. 6. The whole arrangement is simple and substantial. It is the intention later to mount one of these generators on a Ford chassis, as the construction of the machine readily adjusts itself to this arrangement.

The fundamental principle of welding the plates to the rail applied with this equipment is not new. The method consists of drawing a carbon arc along the upper and lower edges of the plates, welding them to the

groove, leaving a tough close-grained weld of good quality about 1/2 in. deep. The joint when complete thus forms a box girder and the plates when so attached support the rail where the strength is most needed. The joint is independent of the web, which after all is the weakest part. The web, of course, is not affected by heating or in any other way.

The actual time consumed in making the weld is about twenty minutes, so that track can be welded at the rate of two and one-half joints per hour, taking ordinary headway of cars into consideration. In the particular instance of Washington Avenue, Newark, there was a four-minute headway. The energy required per joint, at the rate of a joint in twenty minutes, is about 7 kw.-hr.

The writer was interested to ascertain the effect that the welding had on the original metal of the rail and

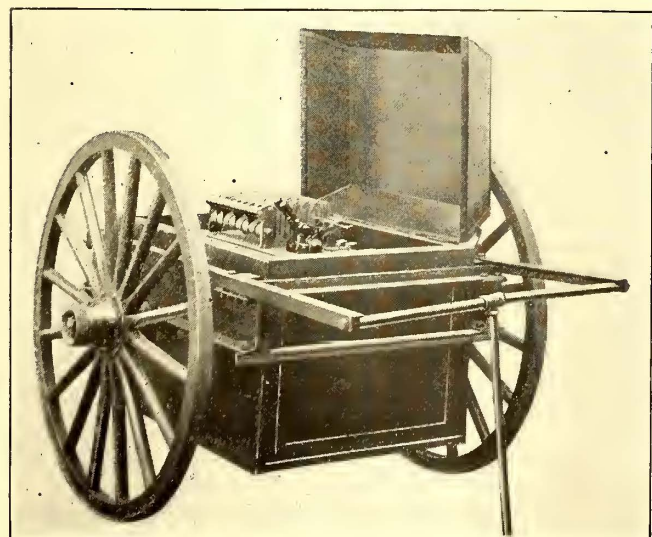


FIG. 5—GENERATOR FOR USE IN MAKING ELECTRIC ARC WELDS



FIG. 6—WELDING RAIL JOINTS WITH THE ELECTRIC ARC



plates. It was found that the Brinell hardness test and the scleroscope test showed no material change. This is a matter of the utmost importance in obtaining a substantial joint.

In Fig. 8 are shown the results of the scleroscope test on one of these arc welded joints. The result of a test made at the Watertown Arsenal was also examined, and it was found that the tensile strength

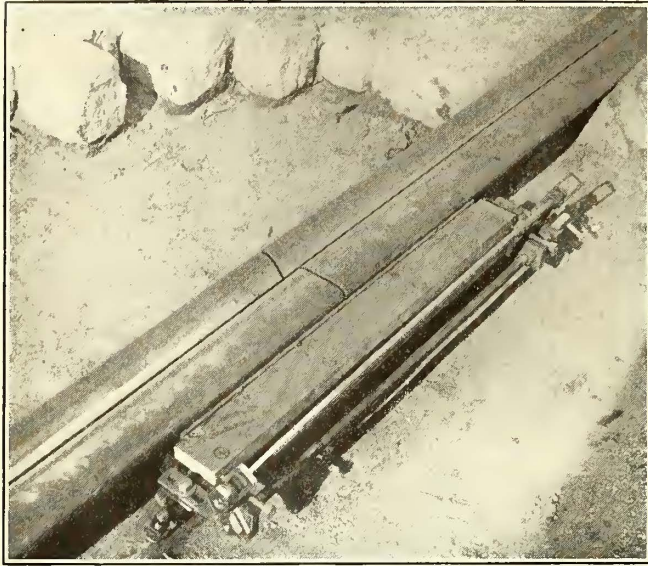


FIG. 7—APPARATUS FOR ARC WELDING OF JOINTS

of the joint was greater than the plates themselves. A transverse test made on a 4-ft. span and with a concentrated load of 50 tons at the center showed less than 1/4 in. set.

The electrical conductance of these joints compares favorably with that of the solid rail. Up to date the Public Service Railway has installed about 1000 of the electric arc-weld joints of various kinds and considering the newness of the method the joints seem to be satisfactory.

It is our intention to continue the installation of these joints, particularly when traffic cannot be held up.

It is the writer's opinion that these welds are not only apparently satisfactory but have two strong features in their favor; first, low cost; and, second, convenience of installation. Moreover, a minimum amount of pavement need be disturbed

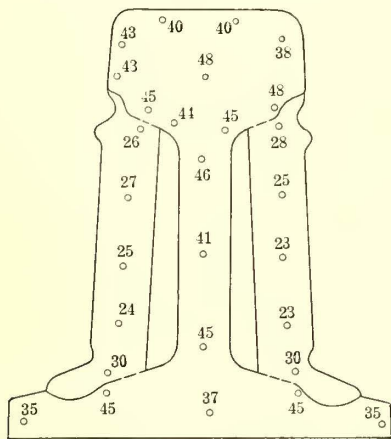


FIG. 8—DIAGRAM SHOWING THE RESULTS OF A HARDNESS TEST ON ELECTRIC ARC-WELDED JOINT

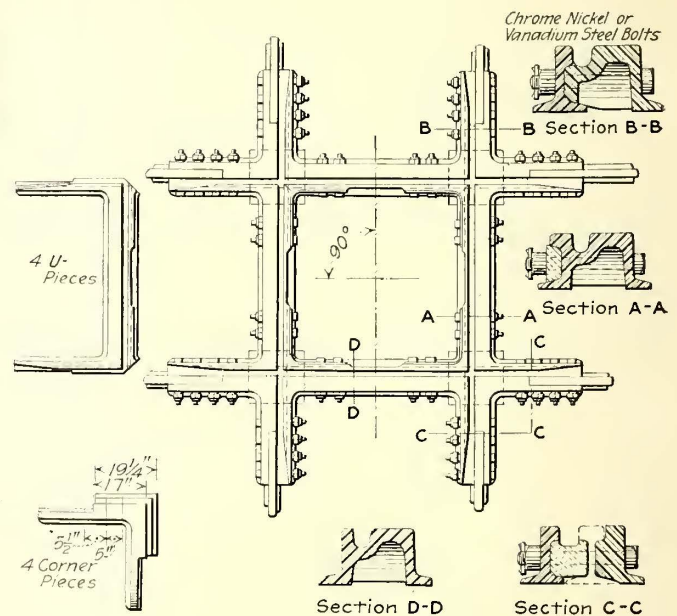
in order to install a joint. Then again, it is convenient to install joints as the rail is being laid so that the track work can be completed one small piece at a time, instead of paving the joints temporarily or leaving them open to be welded at some future date. Also when it is necessary to disturb the pavement a very small amount of paving material is required to be removed and replaced.

## Articulating Manganese Crossings for Longer Life

How the Articulated Crossing Avoids the Objection to a Solidly Cast Intersection and Retains the Qualities of Cast Manganese Steel

THE history of the design of rail crossings for heavy service is one of constant effort to overcome the effect of heavy wear and shock with improved methods of construction.

In the days of rail crossings made successively of Bessemer, open-hearth and rolled manganese steel the great difficulty in maintenance was due to loosening and breakage of the main filling or backbone of the crossings under the increasingly heavier loads and higher speeds. The next step was the introduction of a manganese insert in these crossings, but this too failed in time because the bolts could not hold the structure together, as there were too many small parts wearing one against the other. The next step was the use of cast manganese crossings having the intersections or corners cast solid, and made in one, two or four



DETAILS OF ARTICULATED RIGHT-ANGLE CROSSING

pieces, spliced together with fishplates and joints inside the gage lines of the track. This was expected to overcome the objections raised by the use of bolts in the crossings, as bolts were almost entirely eliminated.

However, an entirely unforeseen difficulty developed, namely, the occurrence of segregation and infinitesimally small hair cracks in the bottom of the grooves at flangeway intersections. These led rapidly to a separation of the corners from the rest of the casting, due to the weaving action when trains passed over, whereby the thin, already-weakened metal in the bottom of the flangeways was rapidly fatigued and ruptured. The development of the lines of rupture along the bottom of the flangeways would practically break up the casting and make it useless despite the fact that the tread or wearing surface itself might still be in perfect condition.

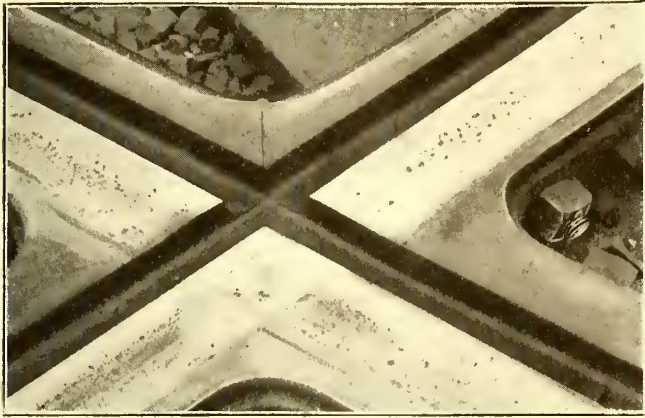
According to experts, this defect of the solid manganese casting cannot be eradicated. A manganese casting resembles an ingot such as is used in making rolled



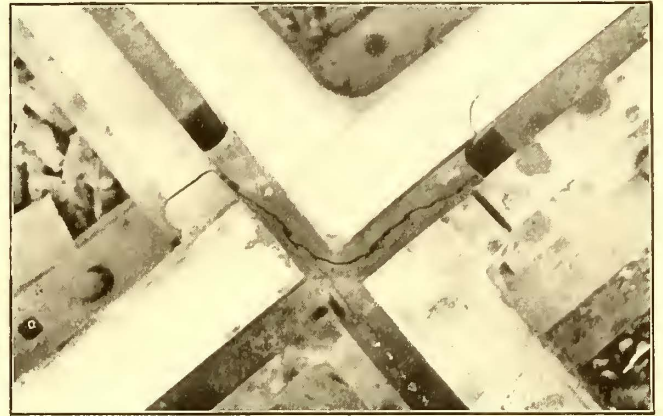
rail, in that the larger the piece the larger will be the void or pipe therein. Consequently, no casting having unequal sections is of equal density throughout, the masses around the pipe being much spongier than the thinner sections and in a manganese crossing with the intersections cast solid the greatest amount of spongy metal would be at the points of double wear adjacent to the flangeway intersections. Another cause of failure is that the metal in the bottom of the flangeway at the

pieces and four U-pieces. These eight parts are held in place by high-grade heat-treated steel bolts of the largest diameter practicable and angle bars or knees to connect the U-pieces at the interior corners. The wings are so designed that, together with a filler, they clamp the end of the running rail tightly in position in each of the crossing arms. An easer is also provided at the extremity of each corner piece.

In this form of construction the interior splices or



CLOSE VIEW OF RAIL INTERSECTION IN ARTICULATED CROSSING



TYPICAL FAILURE IN SOLID CASTING AT RAIL INTERSECTION IN CROSSING

intersections, which also tends to have a spongy structure, fails to amalgamate properly at the time the molten metal is poured into the mold. This failure to amalgamate is caused by a ridge of sand which forms the flangeway intersection in the mold, the casting being poured in an inverted position. To overcome this manufacturers have removed the ridge at the intersection so that the casting can be poured as one piece, the idea being to machine out the groove desired. This practice, however, increases the mass of the casting and so tends to aggravate rather than ameliorate the troubles due to sponginess.

Another argument against the use of this form of construction is the liability of the splices or fishplates at the interior joints to breakage.

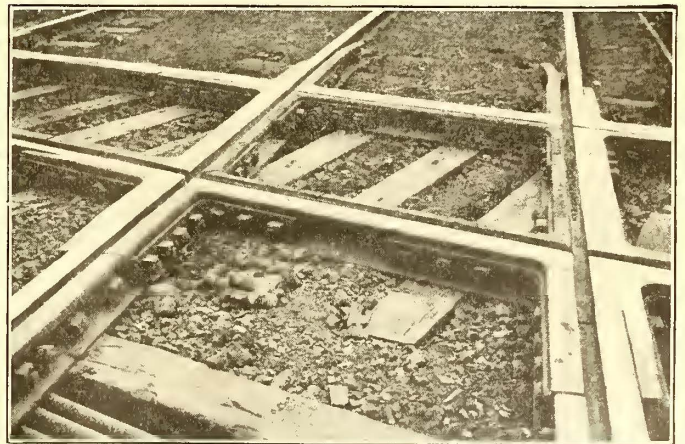
The problem, therefore, resolves itself to this: How can we obtain the wonderful wearing qualities of manganese steel at the points where most needed, inasmuch as crossings made with the intersections cast solid tend to have the poorest metal located at the most critical point?

A solution of this question has been offered by Stephen Balkwill, an experienced maker of special work. Mr. Balkwill applies the principle that the smaller the casting the less it is subject to blemish and imperfection, as strains and stresses set up in large castings are much greater and more liable to breakage due to shrinkage in the cooling than in small castings. Hence he has developed a type built up of sections, known as the Balkwill articulated cast-manganese crossing. In this crossing the joints are mechanically made and placed at the very locations where cracks previously occurred, thus securing absolute control as to where the separation should occur. Consequently it is expected that the crossing will be just flexible enough to yield under loads instead of resisting until the usual cracks develop in the flangeway intersections.

A Balkwill articulated cast-manganese crossing consists of eight castings, comprising four corner

fishplates are entirely eliminated in crossings of 90 deg. to approximately 45 deg.

The first of these crossings was installed in June, 1915, where the service conditions soon proved that it was as correct in practice as in theory. This particular crossing, which is 90 deg., is at an intersection of the New York Central main line and the Baltimore & Ohio's ore and coal carrying line at Painesville, Ohio. The service at this intersection is so severe that crossings of Bessemer or open-hearth rolled rails average only a fraction of the life already obtained with the articulated design, and the latter after two and one-half years of service is only half worn out. After resurfacing, this crossing will be in position to give at

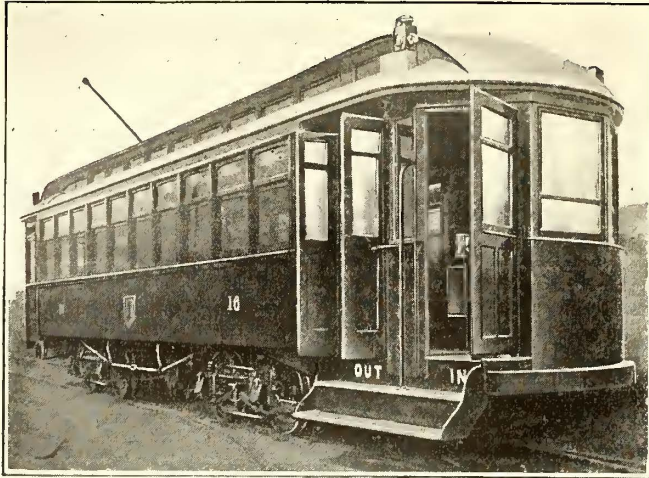


AN ARTICULATED MANGANESE ANGLE CROSSING

least two or more years' service at this location. Since the installation on this pioneer crossing several score have been installed throughout the Central and Western States at points with particularly severe service.

In order to make this type of crossing and other special work inventions immediately accessible to railways throughout the United States and Canada, the Balkwill





TYPE OF ONE-MAN CAR OPERATED IN EDMONTON

### One-Man Cars at Edmonton Have Novel Entrance Door

THE accompanying photograph shows the type of one-man car in operation by the Edmonton (Canada) Radial Railway. At the present time, seventeen of these cars are in operation and six more are to be placed in service in the near future.

J. H. Moir, superintendent, reports that the result of one-man operation has been gratifying and satisfactory and that since this operation began on Oct. 17 not a step accident has been experienced. He also states that the same schedule time is being made as with the two-man cars and that the patrons are well satisfied with the one-man operation.

*(Concluded from page 193)*

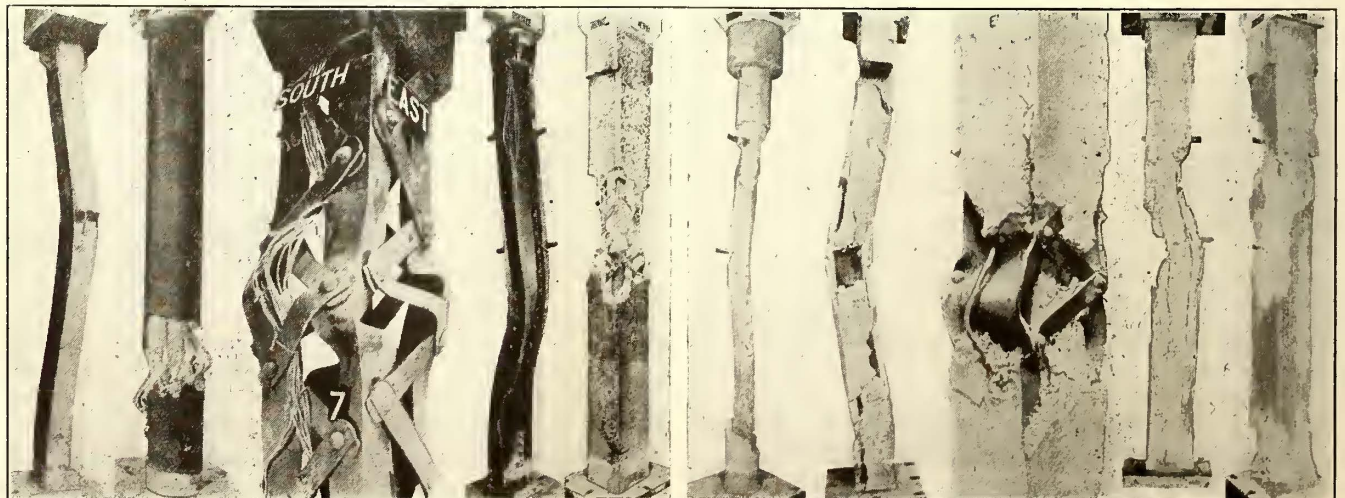
Manganese Crossing Company of Cleveland has been formed to license any manufacturer of special work, or any railway which makes its own special work, to apply the features described. A number of prominent manufacturers are licensed to make these crossings and are prepared to furnish them with reasonable promptness. Mr. Balkwill is prepared to help any frog maker who has no foundry of his own to secure the necessary manganese castings which can be done on very short notice.

### Fire Test of Building Columns

A SERIES of 100 tests to determine the strength of building columns in case of fire, which are being conducted jointly by the Associated Factory Mutual Fire Insurance Companies, the National Board of Fire Underwriters, and the Federal Bureau of Standards at Underwriters' Laboratories, Chicago, are expected to develop data of great interest to engineers, architects, and others interested in building construction. These are the first tests ever made employing modern forms of columns and methods of protection. They were preceded by several years' work preparing the testing apparatus and test specimens. The work was begun last summer, and a year's time will be required to complete the series.

The tests are made on full-size columns of various steel sections, 12 ft. 8 in. effective length, and protected by concrete, tile and other coverings. One unprotected column of each type is also tested. Pressure is applied by means of a hydraulic ram, while the test pieces are heated in a gas furnace, the temperature of which is increased according to a specified standard temperature curve up to 2300 deg. Fahr. at the end of eight hours. The temperature of the furnace is measured with platinum and base-metal thermo-couples supported in porcelain tubes at two elevations, and that of the columns is measured by means of base-metal thermo-couples attached to the metal of the columns at four elevations. An automatic potentiometer recorder is connected so that graphic records of temperature can be obtained.

The compression and expansion are measured by means of wire attached to the column at each end of a gage length of 37 in. Readings of vertical movements are taken by means of microscopes mounted in micrometer slides. The tests are continued to a breakdown of the sample, and hence no inferences as to the comparative merits of the different column designs shown in the accompanying illustration can be drawn. The time to obtain failure for the columns tested thus far varies from seventeen minutes for the unprotected columns to more than eight hours for those heavily protected. Differences of 100 per cent in effectiveness of fire-resistive materials have already been found between concrete of different aggregates. The figure below shows several columns after failure.



TEST SPECIMENS OF BUILDING COLUMNS BROKEN DOWN IN FIRE TESTS TO DETERMINE EFFECTIVENESS OF COVERINGS



# Cost Data on Special Work Construction—II

By M. BERNARD

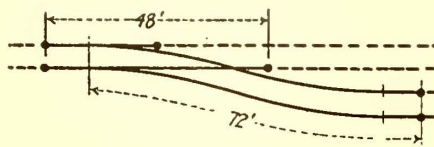
Assistant Engineer Way & Structures Department,  
Brooklyn (N. Y.) Rapid Transit System

This is the second plate of the series of Cost Data on Special Work Construction supplementing the series of plates giving Cost Data on Special Work Renewals. The following four units are of the same types as those covered in the issues of Dec. 8, page 1043, Figs. 28, 29 and 30; Nov. 10, page 871, Fig. 21.

**Fig. 5—Side Turnout**

Length—120 ft. single track

New construction—7-in. girder rail\*—5-in. granite on concrete  
Old construction—street graded, unpaved

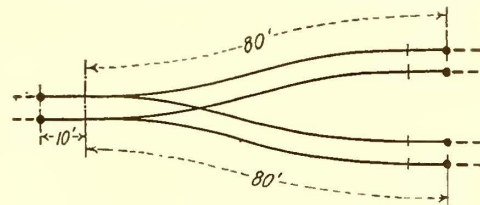


	No Traffic
Labor .....	\$144.00
Handling .....	66.00
Miscellaneous .....	16.00
<b>Total (except materials) .....</b>	<b>\$226.00</b>
Cost per single track foot.....	1.89

**Fig. 6—Equilateral Turnout**

Length—170 ft. single track

New construction—7-in. girder rail\*—5-in. granite on concrete  
Old construction—street graded, unpaved

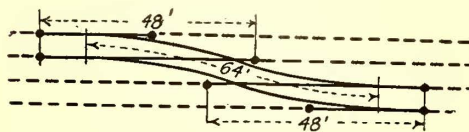


	No Traffic
Labor .....	\$215.00
Handling .....	95.00
Miscellaneous .....	25.00
<b>Total (except materials) .....</b>	<b>\$335.00</b>
Cost per single track foot.....	1.97

**Fig. 7—Right Hand Cross-over**

Length—160 ft. single track

New construction—7-in. girder rail\*—5-in. granite on concrete  
Old construction—street graded, unpaved

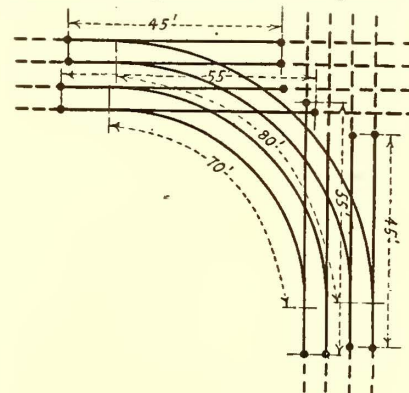


	No Traffic
Labor .....	\$230.00
Handling .....	60.00
Miscellaneous .....	30.00
<b>Total (except materials) .....</b>	<b>\$320.00</b>
Cost per single track foot.....	2.00

**Fig. 8—D.T. Connecting Curve (90 Deg.)**

Length—350 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 .....	\$640.00	\$640.00	\$710.00
Handling .....	180.00	190.00	200.00
Miscellaneous .....	100.00	120.00	140.00
<b>Total (except materials) .....</b>	<b>\$850.00</b>	<b>\$950.00</b>	<b>\$1,050.00</b>
Cost per single track foot.....	2.43	2.72	3.00

\*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.



# News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

## Statement by Arbitrators

Majority of Puget Sound Board Urge a Physical Valuation and Relief for the Railway

A supplementary statement with recommendations was issued on Jan. 5 by Dr. Henry Suzzallo and C. J. Franklin, comprising a majority of the arbitration board which recently settled the differences between the Puget Sound Traction, Light & Power Company and the Tacoma Railway & Power Company and their employees. A separate statement with recommendations was also issued by James A. Duncan, the third member of the board, representing the men.

Dr. Suzzallo and Mr. Franklin, besides urging a valuation of the property of the Puget Sound Traction, Light & Power Company by the State Public Service Commission, as has already been done in the case of the Tacoma Railway & Power Company, recommended an increase in the fares, a charge for transfers, relief to the company from certain franchise obligations, such as maintaining crossing police, paving between tracks and the 2 per cent gross income tax.

Mr. Duncan said that it was not fair to deny to the company's employees an eight-hour day and a reasonable wage because of war conditions, and to grant an eight-hour day to other workers at wages that come near meeting increased costs.

## Tinkering St. Louis Grant

Disorder Prevents Aldermanic Committee From Completing Its Franchise Program

The public utilities committee of the Board of Aldermen of St. Louis, Mo., on Jan. 8 postponed action on the substitute for the two bills looking toward the settlement of the United Railways franchise matter. They took no action because it was felt that the section of the ordinance governing the so-called mill tax was indefinite. Chairman Barney L. Schwartz and the other members of the committee wanted to confer with C. E. Smith, consulting engineer for the city, and the law department, before agreeing to report the substitute. The substitute provides for the payment of all due portions of the mill tax within one year after the proposed franchise is accepted by the United Railways. The committee was concerned about the matter of the interest payments. The discussion lasted three hours.

On Jan. 10 the committee decided by a vote of six to one to require the United

Railways to pay 6 per cent interest on deferred payments of the mill tax and to require it to be paid in not more than five years. The committee voted to reject a proposed amendment eliminating a board of control and transferring its duties to the board of public service. The board of control clauses will be retained in the bill. The bill virtually was completed on Jan. 10 except for clauses providing extensions and betterments in service.

## OTHER MEETINGS NECESSARY

It appeared likely on Jan. 10 that the bill would be completed by the committee in time for reference on Jan. 14 to the board of public service for its recommendations. The program was upset, however, by the turmoil that prevailed at the adjourned hearing. Among those who attended the session was a delegation from the Central Trades and Labor Union. Denials were made by the union men of any attempt on their part to storm the meeting, but the confusion was so great that the committee failed to agree on the amendments, and other meetings will have to be held. It was expected that the committee would convene again on Jan. 18.

## Montreal Report Ready

The Montreal Tramways Commission, appointed by the Provincial government a year ago to draft a new franchise between the city of Montreal and the Montreal Tramways, will place its findings before the Quebec Legislature in a few days.

The commission values the investment in the tramways company at \$38,000,000 and will allow 6¼ per cent on that amount as earnings. The city of Montreal is to receive \$500,000 annually when returns are made. From profits left over, the commission suggests that after the 6¼ per cent dividend and the city's \$500,000 have been deducted, the remaining profits be divided as follows: City of Montreal one-third and the company one-third and the remaining third to go to a fund to reduce the cost of transportation to the public. Instead of selling tickets to passengers at six for 25 cents, a straight 5-cent fare will be charged with full transfer privileges to any part of the city, a ride of 13 miles.

An allowance of 6¼ per cent on the \$38,000,000 valuation will net the company \$2,375,000 clear, and net earnings after taxes, worked out on the basis of the commission's report, would be \$3,025,327, the company's percentage \$2,375,000, and the city of Montreal's share \$500,000, which would leave a balance of \$150,327.

## Chicago Suffered

Papers Pay Tribute to Surface Lines, But Deplore the Lack of Subway Accommodations

Renewed interest in subways for Chicago is a development of the great snow storm and blizzard which for more than a week demoralized surface transportation and threw an unusual burden on the elevated roads. Almost without exception the local newspapers paid editorial tribute to the ceaseless activity of the Chicago surface lines which by use of sweepers and plows provided highways for the relief of a storm-bound people. Following this comment were other editorials pointing to an object lesson of Chicago's experience, namely, that subways would make the city independent of blizzards.

## NEWSPAPER COMMENT

The *Tribune* said:

"It is safe to say that 50 or even 75 per cent of this interference would not have occurred if Chicago had a subway system, and we are not speaking of a comprehensive system, but a few main line tubes extending 2 or 3 miles outside of the loop. And a like improvement, even though not so great, could be accomplished in normal times.

"Straphangers should reflect that we could have such a subway now except for one thing. That thing was the opposition of misguided civic organizations and self-appointed watchdogs of the treasury. They were so fearful that the traction companies might get a nickel to which they were not entitled or even an extra nickel beyond bare subsistence, that they defeated every project so far submitted."

The *Examiner* said:

"Once more the citizens of Chicago have had an object lesson of what they are losing by putting off the construction of city-owned rapid transit subways . . . Chicago will never know what real transportation means—in speed, in regularity, in comfort, at all seasons of the year, and under all weather conditions—until it builds and operates rapid transit subways."

A pending plan for transportation improvement in Chicago includes building of subways and extension of elevated lines. This program was halted in the State Legislature last summer through a difference of opinion over the character of enabling legislation that should be provided. Negotiations were reopened recently in the City Council, and while all parties realize the impossibility of raising the necessary millions of dollars during war times, it is expected that discussions will continue so that an agreed plan will be ready for popular vote when conditions improve.



## Brazilian Electrification

### Representative of Government Favors Immediate Work on Rio de Janeiro Suburban Lines

Dr. Cezar Rabello, a Brazilian engineer, member of the American Society of Civil Engineers and the American Institute of Electrical Engineers, and director of the Cia Brasileira de Energia Electrica, sailed recently for his home in Rio de Janeiro.

The Cia Brasileira de Energia Electrica is one of the most important central station holdings in Brazil. It operates hydroelectric plants in the states of Rio de Janeiro and Bahia. Dr. Rabello has been the leader of both projects, and while in the United States placed the final order for the Bahia project with the General Electric Company. This plant will have an ultimate capacity of 30,000 kva. The Rio de Janeiro plant has equipment for 15,000 kva. installed.

The Brazilian government chose Dr. Rabello chairman of a commission to report on the electrification of the Estrada de Ferro Central do Brazil, the most important steam railroad of Brazil owned by the federal government. At present the project is to electrify only the suburban district of Rio de Janeiro. At the end of this district the road goes over a range of mountains with heavy grades, very sharp curves and many tunnels. Dr. Rabello visited the Chicago, Milwaukee & St. Paul; Butte, Anaconda & Pacific; New York Central; New York, New Haven & Hartford and Pennsylvania Railroad electrifications. He is returning to Brazil very much impressed with what he saw and learned and enthusiastic about the courtesies he received from the different men he came to know.

Emphasis is laid by Dr. Rabello on the fact that the system of propulsion selected for Brazil should be the simplest, due to the distance from the manufacturer or the source of repair parts. He feels that the time to begin the work in Brazil is now because successful operation is assured by the results in the United States, and even with the present abnormal prices of material a large saving could be effected, due to the high price of coal. Dr. Rabello inclines to the opinion that the railroads in Brazil should follow the lead of the Chicago, Milwaukee & St. Paul Railway and buy power rather than attempt to generate it.

### Colonel Kealy Raps Industrial Slacker

Philip J. Kealy, for several months on leave of absence from his position of president of the Kansas City (Mo.) Railway, returned to active management on Jan. 14. Colonel Kealy issued a statement to the employees and to the public in part as follows:

"These are abnormal times. Our nation's existence is threatened. Extraordinary economic situations exist. Our business is seriously affected, for the reason that no business has escaped. But the more abnormal the situation,

the greater should be our efforts and resolutions to overcome it.

"To bring this about, it is necessary that every man do his duty. We are all public servants, our company is a public service corporation. Service cannot be given the public unless every employee is on the job regularly. He must not be a fair weather servant of the public, or a fair weather employee of this company.

"He who fails to report for duty, unless actually sick is a slacker, a worthless, disloyal employee—a faithless public servant.

"This company wants no slackers; it will not tolerate them. If there be those in the service of this company who feel they cannot co-operate toward this end, the time for them to get out is now. The man who sticks to his post of duty is a valuable public servant and will be so treated.

"This is no time for agitators or trouble makers. The kaiser's allies have no place in this country. The vast majority of the employees are loyal but a few disgruntled ones are placing all of us in a bad light.

"Those of us who are not permitted to join the men in the trenches should be soldiers at home, and the only way we can fulfil this obligation is by doing our work regularly as civilians whether that work be on the street cars or in some industrial institution."

## Debate M. O. Plan

### East San Francisco Bay Cities Plan to Study the Matter of Taking Over Electric Railways

The formation of a public utilities district for the acquisition of the electric railway system which serves the several cities on the east side of San Francisco Bay was the subject of discussion at a meeting in Berkeley on Jan. 14, attended by 200 citizens of Alameda and Contra Costa Counties. The sentiment of the meeting is reported to have been very strongly in favor of public ownership of the railway system and there was hearty indorsement of the plan to investigate the matter.

Mayor Samuel C. Irving of Berkeley was named chairman of the committee, and he was empowered to appoint five other members representing the entire East Bay region, to study the plan in further detail and lay out the formal organization. E. W. Wilson, secretary Alameda County Tax Payers' Association, was elected secretary of the committee. The other members were to be selected later.

## \$1,000,000 Fire in Buffalo

The Forest station of the International Railway, Buffalo, N. Y., together with 100 cars, was destroyed by fire on the night of Jan. 23. The total loss is unofficially estimated at \$1,000,000. The company operates about 400 miles of electric railway. Its equipment as reported in the last edition of the "McGraw Electric Railway List" consisted of 945 motor cars and 93 other cars.

## Toledo Men Insistent

### Apparently Unwilling to Accept Anything Less Than a Ten-Cent Advance in Wages

At a recent conference between Frank R. Coates, president of the Toledo Railways & Light Company, Toledo, Ohio, and representatives of the motormen and conductors the unwillingness of the men to accept an increase in wages of less than 10 cents an hour was brought out. Mr. Coates said that the company could not afford to increase the wages of its men under the present rate of fare. He promised to consider the matter and give an answer later.

H. K. Apple, representing A. L. Faulkner of the Federal Department of Labor, and Mayor Cornell Schreiber were present at the conference. Henry L. Doherty could not attend. Mayor Schreiber stated that the dispute would have to be settled speedily. He had formulated a plan for a complete government investigation. Mr. Apple said the government would probably not furnish the expert accountants needed for such an investigation. President Coates could not say at the time whether the company would be willing to bear the expense.

Mr. Coates asked the representatives of the men what would be the smallest increase they would accept. The reply was "nothing less than 10 cents an hour." Mayor Schreiber then said:

"Owing to the fact that you have a contract, it should be observed as much as possible. If the present wage is insufficient it should be increased only so much as is necessary for a living wage. We are here representing three interests. Mr. Coates represents the company; you men represent the union and I represent the public who use the cars. My chief purpose is to see that the public does not suffer through this controversy. I should like to see it settled as quickly as possible and will do everything I can to make a settlement that is agreeable to both parties."

A communication is expected from Mr. Doherty, chairman of the board of directors of the company, stating when he can meet with the representatives of the men and the government to discuss the matter.

### AUDIT DECIDED UPON

On Jan. 16 it was decided to audit the books of the company to learn whether it will be possible to increase wages. Nau, Rusk & Sweringen, Cleveland, were selected to do the work. The arrangement, however, is still subject to the approval of Mr. Doherty.

Mr. Coates told those who attended the conference on Jan. 16 that the days of 3-cent fare were past. Where the rates are increased to meet abnormal conditions, however, they may be lowered when these conditions no longer exist.

Nau, Rusk & Sweringin began an examination of the books of the company on Jan. 21 to determine the increase in the cost of operation.



## Freight Tunnels for Hudson

They Provide Only Efficient Solution of Congestion Problem, According to Improvement Commission

The construction of at least one tunnel under the Hudson River for railroad and vehicle traffic will undoubtedly be urged upon the State of New York at the present session of the Legislature. This was indicated by remarks made on Jan. 19 by William M. Van Benschoten, chairman of the Commission on West Side Improvement. Mr. Van Benschoten said that the people of Greater New York were now paying a severe penalty for "having permitted politics, prejudice, personalities, indifference and incapacity to prevent in the past the development of adequate and efficient freight terminals, as well as up-to-date and progressive transportation facilities between New York and the New Jersey shore." He said further:

"We must have adequate freight terminals and adequate and efficient transportation facilities between the city and the lines at the Jersey shore which reaches out to the source of supplies for the city. Connecting bridges have been advocated. The railroad companies cling to their lighters and barges and car floats, but I believe that the only efficient, at all times adequate and proper solution of the Jersey-Manhattan transportation problem is the tunnel, free as it would be from the fiercest storm or the coldest weather.

"With such under-river connections a proper development of terminal facilities in our own Manhattan, and with, perhaps, as the time goes on, a further extension to the other boroughs of the city, would guarantee the people against repetition of the conditions which now exist. In this connection it should not be forgotten that the inadequate terminal facilities in the city are a burden on all the railroads stretching across the continent."

## War Committee

National Body Organizes So Commissions Can Work Together to Help the Government

James Blaine Walker, secretary of the National Association of Railway and Utility Commissioners and of the Public Service Commission for the First District of New York, on Jan. 19 said that part of the program of the association for assisting the government to co-ordinate the work of the public service corporations and insure maximum co-operation provided:

"To obtain and transmit to each state commission from official sources information in general war matters affecting the commissions.

"To answer inquiries and ascertain the facts for the state commissions in matters of general war interest affecting them.

"To advise with the various commissions as to how they can give the most effective assistance to their states and the nation during the war."

A special war committee has been

appointed which will serve as a link between the federal and state governments. This committee consists of Max Thelen, California; Ralph W. E. Donges, New Jersey; Joseph B. Eastman, Massachusetts; Frank H. Funk, Illinois; Travis H. Whitney, New York, and Edward C. Niles, New Hampshire.

Mr. Walker said:

"The movement includes the railway commissions, and these have been working with public service commissions. There have been many conferences to learn what can be done in a constructive way to help the states and the nation. In these conferences consultations have been had with Governors, the State Council of Defense, and other officials and organizations.

"Much of the work done so far has been of a confidential character, and all of it, in fact, is so bound up with matters under national control that a revelation of our activities must not be made at this time. Just what each state commission should do in the matter of helping the government has been carefully set forth and transmitted to the chairman of each of the commissions. This assures uniform activities, and the danger of some of us working at cross purposes is thus removed."

## Motor-Bus Petitions Decided

Dissenting Opinion Draws Distinction Between Regulation for Jitneys and Electric Roads

The Public Utilities Commission of Illinois has granted the Chicago Stage Company a certificate of convenience and necessity to operate motor buses upon the boulevards and streets of the South Side and denied a certificate to the Chicago Motor Bus Company on the ground that the Stage Company is in a position to render adequate service. Commissioner Shaw dissents from the majority opinion, saying:

"In general, I believe it may be said that regulation contemplates that, as long as a utility renders adequate service at reasonable rates, it should not be subject to competition for the reason that when adequate service is rendered at reasonable rates a duplication of plant and facilities is an economic waste which, in the end, the general public must suffer. However, there is a vast difference between a public utility operating motor buses and a public utility operating an electric railway, a gas plant, an electric plant, a water plant, or a steam railway. The equipment of a motor bus company consists in the main of individual buses to the number required, general offices, and a place to house and repair the buses. It has no large investment in generating plants, distribution systems, tracks, etc.

"Therefore, in my mind, a public utility operating motor buses is not comparable with other utilities subject to regulation. It appears to me that the motor-bus business is more nearly comparable with the taxicab business, over which this commission has heretofore held it had no jurisdiction."

## News Notes

**Water-Power Bill Already Drafted.**—Representative Sims, chairman of the new water-power committee of the House, intends to call a meeting of the committee within the next day or two. The bill which the committee will consider is already drafted and embodies the administration's program for developing and conserving the water-power resources of the country.

**Commission Functions Unchanged by Federal Order.**—It was decided at a conference in Washington between representatives of the National Association of Railways and Public Utility Commissioners and Director-General McAdoo that the functions of the state railway and the public utility commissions throughout the country before the government operation of the railroads will remain unchanged.

**Cleveland Commission Meets.**—A meeting of the Cleveland Street Railway Commission was held in the office of Otis & Company on Jan. 8. Data were submitted by City Engineer Hoffman and Street Railway Commissioner Sanders. Chairman Charles A. Otis said that the members of the commission would probably visit other cities to make a study of the subway problem. It will be some time before any definite recommendation can be made.

**M. O. Bond Bill Recommended for Passage.**—The utilities committee of the City Council of Seattle, Wash., has recommended for passage a bill submitting a general bond issue to the voters at the general election on March 5 for the construction of an elevated railway on Washington Street, Railroad Avenue, Whatcom Avenue and Spokane Street, extending from First Avenue south to the west waterway. Twenty-year bonds, bearing interest of not more than 5½ per cent, are provided for in the bill. Interest on the bonds is to be provided for in each annual tax levy, and provision is to be made at the beginning of the fifteenth year for the retirement of the bonds at maturity.

**Severe Snow in Texas.**—The recent heavy snowfall in Texas caused great inconvenience and in some cases total interruption to city and interurban railway traffic. The Dallas Railways was forced to suspend traffic on some of its lines on account of snow and ice on the tracks, and the Texas Electric Railway, the consolidated Strickland lines, was forced to suspend operation over an 8-mile stretch of its track near Milford. Cars were operated from Dallas to the impassible snow drifts and also from Corsicana to the snow barrier. Traffic was interrupted for nearly forty-eight hours before the line was opened. The company did not attempt to transfer passengers and freight over the break.



**Accident to Power Plant.**—A goose-neck in a high-pressure steam line connected to four boilers in the plant of the Kansas City (Mo.) Railways, burst on Sunday, Jan. 13. The entire plant was filled with steam. Two men who could not escape were killed. Firemen and engineers cut the fires and ran. The steam was reduced sufficiently after two hours for the workmen to return, make the repairs and restore operation. The engineers who investigated the accident reported that the piping had adequate flexibility, but that the immediate filling of the boiler room with steam prevented those on duty from ascertaining the source of the trouble and closing the broken valve. Electric railway service was suspended for three hours. Electric lights outside the business district of the city were cut off for three hours longer.

**M. O. Bill Again Referred.**—The bill providing for municipal ownership of public utilities which was introduced into the Legislature of New York by Democratic Leader Wagner with the approval of Mayor Hylan of New York City was taken on Jan. 17 from the public service committee and sent to the cities committee. When the Wagner bill was introduced in the Senate it was referred to the public service committee, of which Senator George F. Thompson, Niagara, who conducted the investigation into the Public Service Commissions, is the chairman. Senator Brown was absent when the bill went to Senator Thompson's committee, so he moved on his return to have the Wagner bill taken from the committee on public service and sent to the committee on cities, of which Senator George F. Argetsinger of Rochester is the chairman.

**Advised Against Acceptance of Valuation Contract.**—City Attorney Callaway, of Dallas, Texas, has advised the City Commissioner not to accept the contract entered into between the Dallas Railway and the Northern Texas Traction Company for the valuation of the Stone & Webster properties in Oak Cliff. The city attorney says that if the city accepts the contract it becomes irrevocably bound by the findings of the engineers employed to make the valuation. It is maintained that under the contract the Dallas Railways could add any expense incurred in connection with the valuation to the property value to be used as a basis for rate-fixing under the service-at-cost franchises. It is desired that a contract be framed providing that such expense shall be submitted to the Supervisor of Public Utilities of the city of Dallas for revision and approved before being added to the values.

## Association Meeting Program

Central Electric Railway Association

The annual meeting of the Central Electric Railway Association will be held in the city of Dayton, Ohio, on Feb. 28.

# Financial and Corporate

## Depreciation Fund Case

**New York Commission Upheld in Requiring 20 Per Cent Fund for Maintenance and Depreciation**

An order issued by the First District Public Service Commission in February, 1912, directing the New York Railways to set aside each month 20 per cent of its gross operating revenues to provide for maintenance and depreciation must be obeyed. The company objected to the order and obtained a writ of certiorari from the Supreme Court, but the Appellate Division dismissed the writ on Jan. 18 and affirmed the order.

The order was made after the reorganization of the old Metropolitan Street Railway. The new company, the New York Railways, objected to the 20 per cent requirement on the ground that it was not always necessary to use so much for the purposes designated. The company also insisted that its directors were the proper persons to determine the amount of the depreciation reserve fund and not the commission.

The present decision, besides sustaining the commission in this particular case, makes it clear that the law has vested the commission with full powers to regulate the methods of public service corporations. Part of the opinion of the court reads:

"If this power be denied the directors are at liberty to divert this fund, necessary for the maintenance of the value of the security and also necessary for adequate service to the traveling public, to the payment of the interest on the income bonds. When, therefore, in the course of time it becomes necessary to replace obsolescent and depreciated equipment, what is the situation created? No fund will have been created for that purpose. The commission is not authorized to assent to the issuance of new securities therefor. The necessary replacement cannot be made for lack of funds and of ability to procure them. The corporation becomes unable to perform its public functions, and corporate death is inevitable. Another reorganization becomes necessary, with the consequent material impairment of securities.

"Even if power existed to raise money for replacement by the issue of new securities the fatal ending is only postponed. If the Legislature has left this loop-hole in its scheme for the protection of the security holders, it has made a serious blunder. Such a fate has befallen too many of these corporations, and it was largely to prevent just such catastrophes that this commission was created. The court should not so construe the powers given as to permit the very evils which the Legislature has sought to remedy."

## Seeking to Save Road

**Residents Along Line Sold for Junk Voluntarily Pay Seven-Cent Fare to Increase Revenues**

Efforts are being made to save the Taunton & Pawtucket Street Railway (Bristol County Street Railway), Taunton, Mass., from the scrap heap. The road was sold recently under foreclosure to Swift, McNutt & Company for junk. In the interim between the sale and its confirmation by the court the people who would be discommoded by the removal of the line have injected themselves into the situation in an effort to continue the property as a going concern. Confirmation by the court was set for Jan. 21.

As a first move to prevent abandonment the Superior Court on Jan. 11 refused to allow the petition of the receiver to discontinue operation. It was promptly arranged, however, that all trips regarded as unnecessary be abandoned at once. Then an appeal was made that patrons of the line voluntarily pay a 7-cent fare. At Attleboro on Jan. 15 general committees met to discuss the future of the road. At that time Attorney Burke presented figures to show that the fare increase during the last five days had netted 37 per cent increase, and he figured that the increase in revenues under the new fare would be \$10,000 for the year. Plans were discussed for a reorganization of the company by having the residents along the line take stock.

The advance in the fare unit from 5 cents to 7 cents makes the fare between Attleboro and Taunton 28 cents instead of 20 cents. In the new schedule 2 cents is charged for transfers.

## Gary Issues Approved

The Indiana Public Service Commission has authorized the Gary Street Railway, the successor to the Gary & Interurban Railway and the East Chicago Street Railway, to issue \$365,000 of 6 per cent non-cumulative preferred stock at 90; a like amount of common stock at 75; \$125,000 of 5 per cent first mortgage bonds at 85 to pay for proposed extensions, and \$800,000 of 5 per cent second mortgage bonds at 75. The company asked permission to issue \$437,500 of preferred stock, \$1,500,000 of common stock, \$350,000 of first mortgage bonds as part of a proposed issue of \$2,500,000 and \$800,000 of debenture bonds. It was represented in the company's petition that the stock, the debentures and \$125,000 of the first mortgage bonds were to be used in paying for the city railway systems and the interurban lines operating between Gary, East Chicago and Hammond. The interurban system consists of 33 miles of track.



## War Direction of Security Issues Asked

### Investment Bankers Favor the Creation of Semi-Official Board—Corporate Financing Cut, But No City and State Retrenchment

The Board of Governors of the Investment Bankers' Association of America has formally approved a report of a special committee which had been studying the question of supervising security issues. The committee suggested that a semi-official board be created and charged with supervision of the issuance of corporate, state and municipal securities for the duration of the war and the period immediately following its conclusion.

The special committee, which was appointed at the October convention of the association, consisted of Allen B. Forbes, New York, chairman; William R. Compton, St. Louis; M. P. Hallowell, Boston; H. C. McEldowney, Pittsburgh, and H. L. Stuart, Chicago. Copies of the committee's report have been forwarded to William G. McAdoo, Secretary of the Treasury, and Paul M. Warburg, Governor of the Federal Reserve Board.

#### WAR FINANCING DIFFERENT HERE

After surveying war financing in England, France and Germany, the committee said:

"Our situation is different. The United States, to speak financially, is called upon to be self-containing and self-sustaining from the start. Our own people must take a practically continuous issuance of federal government securities. In addition, we must finance such corporate, state and municipal needs as are essential. This, then, seems clearly to require the handling of the situation on a broader basis than has been necessary in England."

The accompanying data were presented by the committee to indicate the amount of financing in the United States for 1916 and 1917. Totals were also given for the last three-quarters of each year, approximately including the time since the entry of the United States into the war. Foreign government issues were excluded.

#### RECORD OF FINANCING IN 1916 AND 1917

	Railroads	
	1916	1917
April:		
Twelve months.	\$368,800,000	\$440,800,000
Nine months,		
April-Dec. . . .	192,500,000	157,900,000
	Industrials	
Twelve months.	\$951,400,000	\$728,500,000
Nine months,		
April-Dec. . . .	655,000,000	457,000,000
	Public Utilities	
Twelve months.	\$541,200,000	\$406,800,000
Nine months,		
April-Dec. . . .	400,400,000	218,600,000
	Total Corporate Financing	
Twelve months.	\$1,861,600,000	\$1,576,300,000
Nine months,		
April-Dec. . . .	1,248,100,000	833,600,000
	State and Municipal (Permanent Loans.)	
Twelve months.	\$497,400,000	\$475,800,000
Nine months,		
April-Dec. . . .	376,900,000	371,600,000

The figures compiled, the committee said, indicate the extent of the decline

in corporate financing since the United States' entry into the war. Of the amount of financing accomplished, a large part represented the refunding of maturing obligations or financing which would be considered essential under present circumstances.

In the committee's opinion, this record clearly reflects the strong regulatory power of the securities market upon new flotations. Although the cost of materials and labor has had a restraining influence, the market difficulties have been by all odds the most important factor in the decline of the total amount of these issues during the last three-quarters of 1917. It seems a fair inference that this factor will continue to have its regulatory effect, perhaps as time goes on, to an increasing extent.

The report states that it is apparent that there has been no material decrease in the issuance of state and municipal securities since this country's entrance into the war. In this connection, it was suggested that the President or the Secretary of the Treasury call the attention of the states and municipalities to the urgency of issuing securities only to meet the most pressing demands.

#### SUPERVISORY BOARD NEEDED

The report says in regard to the recommendation for a board to supervise the issuance of securities:

"The moving thought in this recommendation is, first, that the financial activities of corporations, states and municipalities could be better limited and directed by a board than could be accomplished through market conditions alone or through individual or decentralized effort. Secondly, there are urgently needed results to be attained through the constructive as well as the regulative and restrictive work of such a board.

"It is recommended that the membership of this board consist of two classes, namely, (1) representatives of that department or departments of the government most directly concerned in the handling of this situation, and, (2) business men and bankers from private life who are experienced in dealing in a comprehensive way with matters of industry and finance—especially in respect to the issuance of securities. The board should be closely associated with the Treasury Department—in particular with the Federal Reserve Board—and appropriate appointments should be made from these quarters. It may prove advisable, on account of the scope of the board's duties as finally determined, to have among its membership a representative of that branch of the government then in control of war supplies, and also a representative of the federal agency in charge of corporations engaged in interstate commerce.

"The board at Washington should be assisted by appropriate local boards appointed with especial reference to geographical considerations. Familiarity with local conditions would be essential to the proper handling of the subject. It is believed that the Federal Reserve Districts would form advantageous subdivisions for this purpose.

"In respect to the powers and duties of the central and local boards, it is the view of this committee that not only the general policy should be directed by the central board at Washington, but that sufficient central control should be exercised to see that decisions on applications arising in the various local districts are governed by a uniform policy. Moreover, it might be advisable, or even necessary, in respect to some classes of corporate financing, to have the central board decide if the needs of the government, in connection with war supplies, for instance, would make it advisable to allow the concern in question to do new financing.

"It is believed by this committee to be more consonant with conditions existing in the United States that such a board should act under informal rather than formal statutory authority. Undoubtedly, under an informal plan, the board could more readily meet changing conditions."

## Financial News Notes

**Rehearing Asked in Suspension Order.**—The Commonwealth Trust Company, St. Louis, Mo., has asked the Public Utilities Commission of Illinois for a rehearing in the case of the Alton & Jerseyville Railway, Alton, Ill., authorized by the commission to suspend service on Feb. 1 between Alton and Jerseyville and to dismantle the railway property.

**Receiver Sought for Aurora-DeKalb Line.**—Application has been made to the Circuit Court of Kane County, Ill., by a Chicago bank for the appointment of receivers for the Chicago, Aurora & De Kalb Railroad, operating about 30 miles of track between Aurora and DeKalb. It is reported that interest is in default on a mortgage covering the property of the railway, of which the Chicago institution is trustee.

**Time for Bay Sate Deposits Extended.**—The protective committee, representing the holders of the 4 per cent bonds due on July 1, 1954, both of the Boston & Northern Street Railway and the Old Colony Street Railway, has extended to Feb. 15 the time for depositing the bonds with the Boston Safe Deposit & Trust Company, depository. The chairman of the committee is John R. Macomber.



**Bondholders Organize.**—A committee consisting of John McCarthy, Danbury, Conn.; Charles E. Graham, New Haven, Conn., and P. LeRoy Harwood, New London, Conn., has been formed with Mr. McCarthy as chairman and to represent the holders of the first and refunding bonds of the Danbury & Bethel Street Railway, placed in the hands of Judge J. Moss Ives as receiver late last year.

**No Dividend on Common Stock.**—The directors of the Columbus Railway, Power & Light Company have declared the usual quarterly dividend of 1¼ per cent on the "B" preferred stock, payable on Feb. 1, but determined that the conditions do not warrant the declaration of a dividend on the common stock. The reasons for this action are principally excessive costs of fuel, supplies, metal and practically everything used.

**Hearing Jan. 28 on Receivership Plea.**—The application for the appointment of receivers for the United Railways, St. Louis, Mo., filed recently by Ephraim Caplan, attorney for John W. Seaman, New York, N. Y., has been docketed for a hearing on Jan. 28 by Judge Dyer in the United States Circuit Court. Mr. Caplan visited Judge Dyer a few days ago and requested a temporary injunction to prevent legal action on the part of the directors and the bondholders of the company until after the hearing. The Judge refused to act until after the hearing.

**Cancellation of Mortgages Sought.**—Former Governor Judson Harmon, on behalf of J. M. Hutton, Leo J. Van Lahr, Otto Armlender, Claude Ashbrook and Edgar Friedlander, has asked the Ohio Public Utilities Commission to authorize the Cincinnati & Dayton

Traction Company, which recently took over the old Cincinnati, Dayton & Toledo Traction Company, Hamilton, Ohio, to issue \$1,250,000 of common stock, and \$4,500,000 of twenty-year 5 per cent bonds to be sold to cancel mortgages on the property acquired by the new company.

**Deposit Time Extended.**—The committee representing the holders of the Lafayette & Logansport Traction Company's first mortgage 5 per cent bonds of 1936 announces that the limit for the deposit of bonds under the protective agreement, which expired on Jan. 15, has been extended, with the understanding that it may be terminated at any time. The Logan Trust Company, Philadelphia, Pa., is the depository. The Lafayette & Logansport Traction Company is included in the system of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.

**Petition for Receiver Filed.**—A petition for a receiver for the Seattle, Renton & Southern Railway has been filed in the United States District Court in Seattle, Wash., by Charles M. Cook, Boston, Mass., who represents that he is the holder of \$10,000 of first mortgage bonds of the railway. He alleges conspiracy to deprive him of his rightful share in the reorganization of the company. The defendants named in the petition are the Seattle, Renton & Southern Railway, the First Trust & Savings Bank, Chicago; William R. Stirling, Burton Thoms and Louis K. Boisot, Chicago; William L. Elkins and Arthur Morton, Philadelphia, and the Seattle & Rainier Railway.

**Spokane Valuations Compiled.**—The Public Service Commission of the State of Washington has completed a valua-

tion of the Washington Water Power Company's city railway property in Spokane and its interurban lines, and also of the Spokane Inland Empire Railroad, including northern Idaho. Hearings for the taking of testimony will begin at Spokane on Feb. 4, the Idaho Commission sitting jointly with the Washington body. As compiled by the engineers of the Public Service Commission, but not adopted and authorized by the commission, the Washington Water Power Company's system is valued at \$21,624,495 in Washington, and \$2,491,823 in Idaho, or a total of \$24,116,418. These figures are based on the cost of reproduction, and do not include valuation of power sites. When the official valuation is adopted, it will be used as a base for rate-making.

**Dan Patch Line Awaits Washington Advice.**—C. T. Jaffray, president of the First & Security National Bank, Minneapolis, Minn., who is chairman of the committee representing the holders of the bonds of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, and one of the purchasers of the 14-mile cut-off of the road, said on Jan. 16 that nothing more could be done, either to scrap or reorganize the road, until a decision has been obtained from Washington with respect to the disposition to be made by the government of the so-called short-line railroads. He is quoted as follows: "If the short-line railroads are to be left out of it and concentration made on long lines, obviously the 'Dan Patch' will have little business. Mr. Marchand and Mr. Bratnaber are in Washington and may be able to learn whether the 'Dan Patch' comes under the Director of Railways and what may be done with it."

## Electric Railway Monthly Earnings

BATON ROUGE (LA.) ELECTRIC COMPANY						NEW YORK (N. Y.) RAILWAYS					
Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income	Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov., '18	\$20,518	*\$9,907	\$10,611	\$3,611	\$7,000	1m., Nov., '17	\$998,423	*\$745,715	\$252,708	\$281,139	\$19,691
1 " " '17	18,680	*8,527	10,153	3,540	6,613	1 " " '16	837,383	*697,405	139,978	278,824	±\$76,272
12 " " '18	230,584	*115,717	114,867	42,662	72,205	12 " " '17	5,387,330	*3,935,109	1,452,221	1,408,747	±\$29,486
12 " " '17	209,545	*102,128	107,417	41,623	65,794	12 " " '16	4,447,489	*3,386,508	1,060,981	1,410,636	±\$80,416
BROCKTON-PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.						PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.					
1m., Nov., '18	\$8,511	*\$9,858	\$1,347	\$1,286	±\$2,633	1m., Nov., '17	\$25,696	*\$19,223	\$6,473	\$7,927	±\$1,454
1 " " '17	8,507	*9,769	1,262	1,116	±2,378	1 " " '16	26,100	*19,833	6,217	7,246	1,029
12 " " '18	124,194	*123,927	267	14,556	±14,289	12 " " '17	303,661	*231,561	72,100	89,478	±17,378
12 " " '17	121,971	*128,246	13,725	13,278	447	12 " " '16	311,625	*208,633	102,992	86,845	16,147
CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.						PENSACOLA (FLA.) ELECTRIC COMPANY					
1m., Nov., '18	\$42,612	*\$28,256	\$14,356	\$6,468	\$7,888	1m., Nov., '17	\$32,129	*\$18,647	\$13,482	\$7,825	\$5,657
1 " " '17	34,904	*19,084	15,820	6,484	9,336	1 " " '16	21,151	*13,698	7,453	7,726	±\$273
12 " " '18	458,245	*293,237	165,008	78,668	86,340	12 " " '17	342,220	*198,055	144,165	93,503	50,662
12 " " '17	389,650	*228,545	161,105	78,312	82,793	12 " " '16	277,192	*155,688	121,504	91,894	29,610
COLUMBUS (GA.) ELECTRIC COMPANY						PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.					
1m., Nov., '18	\$106,369	*\$37,508	\$68,861	\$31,729	\$37,132	1m., Nov., '17	\$899,903	*\$580,598	\$319,305	\$203,436	\$115,869
1 " " '17	87,021	*31,903	55,118	28,521	26,597	1 " " '16	731,630	*432,984	298,646	184,682	113,964
12 " " '18	1,076,629	*408,472	668,157	355,848	312,309	12 " " '17	9,272,611	*5,686,271	3,586,340	2,332,492	1,253,848
12 " " '17	867,196	*347,933	519,263	343,278	175,537	12 " " '16	8,018,193	*5,092,698	2,925,495	2,210,477	715,018
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.						RHODE ISLAND COMPANY, PROVIDENCE, R. I.					
1m., Nov., '17	\$75,990	*\$39,308	\$36,682	\$12,119	±\$27,465	1m., Nov., '17	\$466,603	*\$540,981	±\$74,378	\$122,376	±\$195,941
1 " " '16	78,859	*38,362	35,497	9,622	25,875	1 " " '16	450,652	*346,949	103,703	119,161	±\$14,499
12 " " '17	928,068	*512,588	415,480	134,441	±297,874	12 " " '17	5,502,349	*4,695,192	807,157	1,332,299	±\$410,501
12 " " '16	820,296	*440,036	380,210	107,245	272,965	12 " " '16	5,330,357	*3,837,225	1,493,132	1,281,775	±\$29,426
EL PASO (TEX.) ELECTRIC COMPANY						SAVANNAH (GA.) ELECTRIC COMPANY					
1m., Nov., '17	\$108,205	*\$68,005	*\$40,199	\$6,503	\$33,696	1m., Nov., '17	\$88,104	*\$57,690	\$30,414	\$24,451	\$5,963
1 " " '16	99,883	*56,104	43,779	5,269	38,510	1 " " '16	74,794	*46,031	28,763	23,706	5,057
12 " " '17	1,292,396	*789,758	502,638	65,835	436,803	12 " " '17	955,658	*636,924	318,734	289,703	29,031
12 " " '16	1,094,844	*645,869	448,975	57,974	391,001	12 " " '16	814,900	*548,318	266,582	282,098	±\$15,516
GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.						TAMPA (FLA.) ELECTRIC COMPANY					
1m., Nov., '17	\$196,272	*\$122,876	\$73,396	\$38,328	\$35,068	1m., Nov., '17	\$78,087	*\$45,153	\$32,934	\$5,334	\$27,600
1 " " '16	170,144	*106,885	63,259	36,824	26,435	1 " " '16	80,779	*44,027	36,752	4,464	32,288
12 " " '17	2,055,027	*1,365,078	689,949	449,116	240,783	12 " " '17	1,004,802	*559,024	445,778	55,401	390,377
12 " " '16	1,931,555	*1,232,696	698,859	438,731	260,128	12 " " '16	961,411	*526,540	434,871	52,391	382,480

\*Includes taxes. †Deficit. ‡Includes non-operating income.



# Traffic and Transportation

## Commission Against Women

Opposes Their Employment in Seattle—  
Favors Fare Increases to Provide  
Proper Help

The Public Service Commission of the State of Washington on Jan. 7 ruled that the Puget Sound Traction, Light & Power Company would not be permitted to employ women to take the places of men as conductors on Seattle cars at this time. The commission also ruled, however, that the company may have a hearing at once on a petition to advance its fares in Seattle from 5 cents to 6 cents. The commission said in part:

"The company, as other similar utilities, is limited in its income to certain sources. In our opinion, the only adequate source by which this revenue can be obtained is through an increase in fares. Eastern commissions, impelled by the increased cost of labor and material, have granted increased rates. In some instances these increases have been to 6 cents and in other instances to 7 cents. Only recently the Oregon commission, for similar reasons, increased the rate in Portland from 5 cents to 6 cents.

"We are satisfied that the women are willing to do their full share in the prosecution of the great conflict now pending. There is, however, some danger that their enthusiasm will lead them into certain callings inimical to the best interests of the State. There is much light manufacturing and many clerkships where they can be employed, and which are not at all harmful to their womanhood, and in many instances, in these lines, they can replace able-bodied men, who can become useful in the more public lines of employment.

"The highest attribute of woman is motherhood. This, in its fullness, includes health. If necessary to the preservation of these things we do not believe that anyone would question the propriety, if need be, of granting to the Puget Sound Traction, Light & Power Company a sufficient income by the increase of rates to make it possible for them to hire proper help.

"That the troublesome question of pay and working conditions may be overcome and an efficient service be maintained, we will entertain from the company an application for an increase of rates, and upon such application being made, will forthwith investigate to determine its condition that a proper order in the premises may be entered."

A. L. Kempster, general manager of the company, had asked the right to employ women on the cars, saying that it was becoming increasingly difficult to retain the men already in the employ of his company, and that it was a financial impossibility for a company

to compete with the wage scales paid in the shipyards. Protest against the employment of women was made by organized labor, through the Central Labor Council.

The officials of the company announced at the conclusion of the hearing that they would take no further steps looking to the employment of women on the cars. They would not say that the company at this time would take advantage of the other alternative offered, that of asking for a 6-cent fare.

## Fare Request Put Off

Des Moines City Railway Will Not Ask  
for a Straight Five-Cent Fare  
at This Time

The Des Moines (Iowa) City Railway has temporarily, at least, dropped its plan to petition the City Council for a rate increase. The company desired to put fares on a straight 5-cent basis instead of six tickets for a quarter, as provided in the franchise. As a preliminary step in the campaign the company offered a wage increase to its employees averaging 2 cents an hour, with the inferred understanding that the men would work for the increase in fare when the matter was submitted to a vote of the people.

The present agreement between the company and the men does not expire until March 1, 1919, and while the men had no desire to break the agreement they felt that in view of the greatly increased cost of living since the contract was signed they were entitled to an increase. Emil G. Schmidt, president of the company, was inclined to agree with them, but advised that it was impossible for the company to assume the additional \$60,000 which the wage increase would entail without an increase in fare. The company's proposition was submitted to the men for a referendum vote and was defeated, so for the present at least no steps will be taken on either request for an increase.

## Women Conductors for St. Louis

The United Railways, St. Louis, Mo., has its first women conductors in training at the Newstead carhouse, where special quarters have been fitted up for them, along with a rear platform and trailer entrance and vestibule in the school room. George Hart, instructor of conductors, is teaching the class. A majority of the twenty-odd students are wives or relatives of employees. The training course will cover sixteen days, dating from Jan. 7. Before the students began to receive instruction they were addressed by President McCulloch, Superintendent Cam-

## New Orleans Report Discussed

Antiquated Franchises Result in Waste  
of Service—Company Operates Best  
When Free of Restriction

The report on railway operation in New Orleans, La., made last year by James E. Allison, St. Louis, Mo., has been discussed recently before the transportation committee of officials and citizens. Mr. Allison said that he found a great waste of service due to antiquated franchises, dating back to the days of competing city railways, each of which was obliged to traverse the business section. He repeated verbally his formal recommendations that this waste be eliminated, and the resulting economies divided between the traveling public and the railway, giving the former better service at rush hours.

Mr. Allison modified his recommendation to the New Orleans Railway & Light Company to buy fifty cars. He doubted whether the company could get the cars now—or if it could, whether it could get fifty at present prices of steel, for the amount the company had agreed to spend—between \$250,000 and \$500,000—on betterments of service.

In response to questions, Mr. Allison said he had made no attempt to decide on what basis division of any savings should be made between the company and the public. He had made no study to determine whether the company was getting a proper return on its investment, nor any valuation of its property. Nor had he made any study of the present transfer system. He said that a passenger should be able to reach any point in the city from any other point without paying two fares. The company should be safeguarded against the use of a transfer to make two trips.

## FORMER MANAGER SLOAN'S IDEAS

M. S. Sloan, former manager of the railway department of the New Orleans Railway & Light Company, was another of those who appeared before the committee. Mr. Sloan agreed with Mr. Allison that no headway requirements should be placed in the new "blanket franchise" if one was obtained from the Legislature in place of the present collection of overlapping and obsolete franchises. Mr. Sloan said that Mardi Gras was the only day in the year when the railway system of New Orleans was operated as it should be. On that day the company was able to handle the crowds expeditiously because it could ignore the franchises and route cars in the interest of efficiency and service alone.

eron and Mr. Crafton. It was made clear that their employment was distinctly a war measure. They will be called conductors and not "conductresses" and, receiving the same pay per hour as the men, they will live up to the same rules and receive the same consideration as the sterner sex. The members of the first class will be put on trailers on the Page line.



## Buffalo Traffic Recommendations Accepted

International Railway and City Expert Work  
Together to Better Service

Many of the recommendations embodied in the first two reports of John C. Brackenridge, New York, who has been engaged by the City Council of Buffalo, N. Y., to make a survey of traffic conditions on the lines of the International Railway, have already been put into effect by the company. Ten lines have been rerouted, and E. G. Connette, president of the International Railway, has agreed to co-operate with Mr. Brackenridge and the municipal electric railway committee with the view of carrying out additional recommendations made by them.

Among the most important recommendations made by Mr. Brackenridge are the staggering of the hours of employment at the large industries; the immediate development of the passenger service of the belt line of the New York Central Railroad around the city; the continued co-operation of the police department in keeping vehicular traffic off the electric railway tracks and prevent overcrowding; construction of parallel lines in streets through congested districts and reorganization of the company's car repair and maintenance departments.

### STAGGERED WORKING HOURS SUGGESTED

Mr. Brackenridge considers the staggering of hours of employment at the large industries in the Hertel-Elmwood Avenue section would be an important factor in reducing much of the present congestion, but says that the employment of almost 45,000 workers in this industrial section is a very great transportation problem, and he therefore recommends that the New York Central Railroad be required to increase its belt-line service between 5 a. m. and 7 a. m. and 4 p. m. and 6 p. m. He believes that an increased belt-line service on two railroad tracks now lying idle would greatly relieve the traffic problem from the industrial district. Mr. Brackenridge said that the double belt line operating for a distance of 15 miles around the city would afford permanent relief that could be obtained in no other way.

By staggering the hours of employment, Mr. Brackenridge believes that the morning and evening peak loads of power consumed by the company would be very greatly reduced for both the morning and the evening rush period. He also said that the tripper cars instead of making one trip as at present could make two or three trips, depending upon the length of the run, making available about 130 cars for additional service.

Telegrams were sent by Mr. Brackenridge to electric railway presidents and managers in more than a score of cities asking for information as to steps they had taken to have large industries stagger the hours of employment. John J. Stanley, president of the Cleveland (Ohio) Railway, replied

that in general the hours of labor were one-half hour or one hour in advance of commercial hours, and that the city railway commissioner in co-operation with the Chamber of Commerce, was working on a plan to stagger by sections or line or employment. M. C. Brush, president of the Boston (Mass.) Elevated Railway, replied at considerable length. He had evidently given the subject much study. Replies were also received from the American Electric Railway Association and electric railway companies in Pittsburgh, Baltimore, Philadelphia, Kansas City, St. Louis and Cincinnati. In each instance efforts were being made by the railroads to secure the co-operation of local commercial associations to stagger the hours of employment.

### INDUSTRIES ASKED TO HELP

President Connette of the International Railway and Vice-President Dickson are now making efforts to secure the co-operation of the Pierce-Arrow Motor Car Company, the Curtiss Aeroplane Company and other large war industries to stagger the hours of their employees. The Chamber of Commerce has started to investigate the problem and the municipal electric railway committee ap-

pointed by the Mayor has secured the co-operation of some factories.

Accepting the recommendation which urged the police department to keep vehicular traffic from the company's tracks, the chief of police has detailed more than two score policemen to patrol the company's tracks on various lines and keep them clear for the quick operation of cars. Traffic officers have also been stationed at congested intersections to prevent overcrowding and to keep the cars moving and prevent congestion and bunching. This movement on the part of the police has reduced to a minimum traffic delays due to "track-hogs."

Before presenting his second report, Mr. Brackenridge made an investigation of conditions in the company's car repair departments, and in his report covering this condition he praised the efficiency of the reorganized departments. He described in detail the company's efforts at the various carhouses to make quick repairs on cars, and told of the manner in which the company had improved its facilities for the quick repair of cars. Mr. Brackenridge declared that the company was now equipped to repair cars faster than they become crippled. He recommended that the company make daily reports to the Mayor of the number of disabled cars and of the progress made in repairing them, and that the repair gangs be kept at work in at least two eight-hour shifts, if not in three.

## Serious Traffic Situation in Seattle

Chairman of Emergency Fleet Corporation Appeals to State Council of  
Defense to Bring All Agencies Together

W. R. Crawford, attorney for Seattle jitney men, appeared before the State Public Service Commission in session in Seattle, Wash., recently, and stated that if the Puget Sound Traction, Light & Power Company would drop its federal court suit, and allow the jitneys to operate, the transportation situation in the city of Seattle would be practically cleared up.

Dr. Henry Suzzallo, chairman of the State Council of Defense, stated at the hearing that he was in receipt of a telegram from Chairman E. M. Hurley of the Emergency Fleet Corporation, asking the Council to take hold of the transportation situation in Seattle. Dr. Suzzallo said:

"I shall probably go ahead at once, and hope to have a series of conferences with the different agencies involved, namely, the steam railroads, the traction company, the ferries of the Port Commission, and the shipyards. It is my plan at the outset to consult with individuals, and get a thorough understanding of the situation from men who know all about it, before calling organizations to the Council table."

The Puget Sound Traction, Light & Power Company, through A. L. Kempster, general manager, has expressed a desire for steam road transportation aid, and a willingness on the part of

the company to go into conference to improve the situation.

Mr. Kempster said:

"We shall be more than glad to meet the city authorities, the heads of the shipbuilding plants, the Seattle commercial bodies, steam railroad officials, the Port Commission and federal representatives in a conference or a series of conferences. The shipyard situation has grown up so rapidly that the transportation system is taxed to the limit.

"The matter of revenue has no weight with us. The sole question is one of transportation. It has been suggested that the railroads have no legal right to enter into local passenger traffic. Our answer is that as the only corporation affected, we will enter no objections on legal grounds to anything the railroads do in this respect. The steam lines very likely would make no money on such traffic at a 5-cent fare, but that is not material. They are under federal control, and the revenues guaranteed."

A. L. Valentine, superintendent of public utilities of Seattle, in an effort to help to solve the transportation problem in the city, wired to Chairman Hurley of the Emergency Fleet Corporation, urging him to assist in obtaining the steam tracks for use.



## Increase in Fare in Effect in Pittsburgh

Beset by Operating and Financial Problems Pittsburgh Railways Saw This the Only Way Out

Like most of the other electric lines operating in industrial centers the Pittsburgh (Pa.) Railways has been called upon since the beginning of the war to meet extraordinary demands for service. These demands were severe enough before the entrance of the United States into the fight for liberty, but they have become more burdensome since that time. Owing to the topography of the city there were natural problems enough to meet in normal times. With the strain that has been added within the last few months and with the coming of winter interruptions to service that ordinarily would pass with only scant notice have taken on for many riders what appears as a serious aspect. The result has been that the company has been charged of late with everything from indifference to the needs of the community to gross incompetence.

The Public Service Commission has projected itself into the situation, and has under way a series of public hearings looking toward a measure of relief. As a preliminary move the commission has already ordered the re-routing of certain lines in the downtown district, has changed some of the stops previously in use, has ordered a consolidation of the freight depots of the suburban lines on the Monongahela wharf and has set forth a standard for heating and cleaning the cars. The company has given public notice that it will endeavor in every way possible to co-operate with the city to improve service in compliance with the recommendations of the commission.

The situation for the company has been made more difficult by the need which arose for not meeting the interest on the bonds of some of the underlying companies. The rumor-mongers at once got busy and many dire things were predicted. It finally became necessary for J. H. Reed, vice-president of the company, to make a flat denial that there was any intention to apply for a receiver for the company in the immediate future.

The company is in need of more revenue. No secret has been made of this fact for some time past. It is now going after this in the direct way followed by other companies throughout the United States beset by the same need. A new tariff was filed with the Public Service Commission in December calling for 5½-cent and 6-cent charges for day traffic. This new tariff was to go into effect on Jan. 22.

The city was quick to jump into the increased-fare fray. After an executive session of the City Council, Assistant City Solicitor C. K. Robinson made a statement in which he said that the city would resist vigorously any attempt on the part of the company to increase its fares.

In a statement which it made the company said in part:

"The respondent denies that the pro-

posed rates, prices and changes as set forth in the tariff and schedule filed on Dec. 22, 1917, to become effective Jan. 22, 1918, are unjust, unreasonable and excessive, and discriminatory, in violation of the public service commission law. Such rates and fares are fair, just and reasonable, and an increase in fares is absolutely necessary at this time unless the service of the respondent is to suffer serious loss and deterioration, as respondent is unable to compete against the high prices of all material and labor without increasing its price on its own product, which is electric railway service.

"A passenger of the company can ride for 5½ cents if he purchases ten tickets, but not otherwise. It is a customary and reasonable way to sell tickets in quantities at a reduced price.

"The respondent denies that the proposal that the night fares shall be 10 cents and that the transfer privileges shall be suspended at that time, are unjust and unreasonable.

"It does not believe that the proposed increase in fares will furnish it with enough money to secure all the labor necessary to operate its system as it

was operated in times of peace, but it knows no other way in which to meet the situation except to increase its revenues so that it may have additional funds with which to purchase labor and material and supplies for the operation of its railway. None of the money secured from this increased fare will be used to pay dividends on the stock of the respondent, but will be used to pay the necessary expenses of operating the electric railway lines included in the system of the company."

### INJUNCTION REFUSED

Judge John D. Shafer, in Common Pleas Court, on Jan. 21 refused to grant the temporary injunction sought by the city of McKeesport and five boroughs through which the company operates to prevent the Pittsburgh Railways from putting the proposed fare increase into effect. Judge Shafer said that the matter of the change in rates was one for the Public Service Commission to decide.

Under the new tariff the cash fare is 6 cents, but two tickets are sold for 11 cents, or ten tickets for 55 cents. In order to facilitate the making of change when cash fare is tendered the company is offering a 4-cent paper change slip in place of 4 cents. These slips it redeems with cash at par or accepts as part payment for another fare.

## Commission Makes Suggestions

Offers Advice to the Boston Elevated on How to Meet Some of the Problems Before It

The Public Service Commission of Massachusetts, through Chairman Frederick J. Macleod, has offered certain suggestions to the Boston Elevated Railway for improving its service. The commission says that it recognizes the difficulties under which the company is operating at present, and that the suggestions are made with the hope that they may prove helpful to the company. Among other things the commission suggests the following:

### SOME OF THE SUGGESTIONS

"That the terms of employment during the period of instruction be made more liberal.

"That the assistance of State and federal employment bureaus be freely sought.

"That the company accept as employees men subject to the draft but not likely to be called for some months.

"That posters be placed in cars and stations stating an imperative need for additional help of various kinds.

"That the union be urged to co-operate in securing additional men.

"That consideration be given to the employment of young men more than eighteen years of age attending schools and colleges.

"That the company's employees be urged to help out, so far as possible, by overtime.

"That patrons, particularly shoppers, be urged to avoid rush hours.

"That theaters and other places of entertainment be induced to close at 4 o'clock.

"That eight-car trains be run morning and evening in the tunnel from Forest Hills to Sullivan Square."

## Fare of 2.5 Cents Allowed

The Indianapolis & Cincinnati Traction Company, in an order issued by the Public Service Commission of Indiana on Jan. 19, has received authority to increase its passenger rates to a basis of 2.5 cents a mile. The action is to be understood as a war emergency measure, and the order may be revoked at the pleasure of the commission and the former rates re-established. The company must report quarterly. The increase was to go into effect on Jan. 23.

A summary of the findings of the commission in the petition of the company shows that there will be a reduction of 5 per cent for round trip tickets; the issuance of the C.E.T.A. commutation books, containing 2000 1-cent coupons, which shall sell for \$17.50, and the coupons shall be accepted at face value for passenger fares.

At the same time, the commission authorized the Union Traction Company of Indiana to charge a minimum fare of 10 cents on its interurban lines, outside of cities and towns, in place of the former minimum fare of 5 cents. This particular phase of the petition of the Union Traction Company had been previously denied when the recent order of the commission was made granting increases in certain interurban and city passenger rates.



## Commission to Study Kansas City Situation

Power, Traffic, Coal, Labor and Revenue Matters All Receive Attention at Hearing Before State Commission

The Public Service Commission of Missouri, following a hearing in Kansas City on Jan. 10 to 12 on complaint of inadequate service by the Kansas City Railways, included in its order to the company this feature:

"In order that the commission may know that the service is installed as promptly as possible, it will be ordered by the commission that Commissioner Flad, with the aid of employees of the commission, shall come to Kansas City and personally observe and see that the defendant company takes all possible steps to secure the necessary labor, power and fuel to install and operate this schedule, and to assist the company in securing the same."

### SIX-CENT FARE APPEAL LIKELY

The company, during the hearing, introduced evidence that it could not afford to improve service without an increase in fare. The commission declared that, under the franchise, the duty of giving adequate service was paramount, and the question of revenues could not be taken up at the hearing. The company will soon, it is said, ask that a 6-cent fare be allowed.

The commission's investigator reported that the Kansas City Light & Power Company, which buys energy from the Kansas City Railways, was not supplying any current for street railway operation on the peak loads. He reported that the power company could render help at the times of maximum loads of the railway sufficient to give exactly the total amount of current needed for operating full schedules. In its preliminary order the commission did not touch on this point.

The commission's appearance in the question of service followed a long period of attacks on the company. The evidence that the company introduced showed that it had been hampered since last summer by labor troubles, rising prices, inadequate revenues, coal shortage, and inability to secure needed equipment. A few days before the hearing the Council adopted an ordinance calling on the company to re-establish the schedule adopted by it last July. The commission sent investigators who prepared reports on the schedules maintained showing naturally that last summer's service was not now being given.

Into this situation the hearing of the commission injected several favorable elements. Col. Philip J. Kealy, who had for several months been with his regiment, had returned a few days before, and he was examined by Clyde Taylor, vice-president and counsel of the company, who acted as president during Colonel Kealy's absence. Colonel Kealy was able to get into the record statements of the situation that seemed to make an impression. On the fuel question, he pointed out that the company had contracted for coal from Illinois, the base price being gaged by

the labor costs, f. o. b. mines—labor and freight both having risen. He added that the Illinois coal did not have the B.t.u. values of the Kansas Cherokee coal—but that coal could not be bought on the B.t.u. basis in the Kansas City district, the company having, indeed, to subsidize two mines recently to get them into operation for adding to its coal resources. The increased cost of fuel to the company this year was \$500,000. Many other increases in costs were mentioned. Colonel Kealy pointed out that the company had tried earnestly to reduce expenses to meet each increased cost. He mentioned as an instance of improvisation the manufacture of trolley poles in the company's shops, because of the many months of delay in securing delivery from companies making them.

### WAGES INCREASED \$361,000 A YEAR

Colonel Kealy said that the direct increase in operating expense due to higher wages was \$361,000 a year. Labor costs for work other than platform service also were responsible for increases other than those that appeared in the records under different headings. In this connection he referred specifically to costs for track work.

Colonel Kealy made it clear to the commission that the problem of getting labor, and keeping it at work, was a very real one. After mentioning the many ways in which trainmen's tasks had been lightened, he added that there were ten times as many complaints from trainmen as formerly; that many who were financially able to do so took the same course as coal miners and worked only when they felt like it. The day Colonel Kealy testified the temperature was 15 deg. below zero, and ninety-four runs were without men that morning, because the men had not showed up for work.

### WOMEN EMPLOYEES CONSIDERED

The company has been arranging to put women on trailers, as collectors, and this matter was gone into by the commission. E. F. Michael, president of the local trainmen's union, had declared that there were plenty of men willing to work for the company, and that it was unnecessary for it to employ women. He said that if the company did hire women, he would advise the men to quit work; that if the commission's investigators found it was necessary for the company to employ women and so recommended, and if the war department of the federal government found that the company should employ women on cars, he still would advise the men to quit work in case the women were actually employed.

Colonel Kealy said:

"Unless the company has credit it cannot borrow, and if it does not earn, it cannot spend."

Colonel Kealy went into the present

financial situation of public utilities. He said that in a growing community like Kansas City the yearly expenditures for capital account must continue, as a community could no more stand still than could an individual.

Toward the end of the session Mr. Taylor suggested to the commission that it appoint a representative to observe the operation of the system and aid the company in overcoming the obstacles. The commission did so.

The result apparently puts the matter of service, and all other matters that have been harassing the company, into the hands of the commission, removing them from the immediate control of the City Council.

## Interurban Station for Kansas City

\$1,750,000 Involved in Plan to Establish Terminal at Tenth and McGee Streets

An ordinance locating a union interurban station at Tenth and McGee Streets, Kansas City, Mo., and granting a franchise to the Interurban Station Company, which will erect and manage the station, on Jan. 7 was passed by the City Council of Kansas City over the Mayor's veto. The ordinance had been pending in the Council for nearly three years.

C. C. Peters, secretary of the Emery-Bird-Thayer Dry Goods Company, is president of the Interurban Station Company. Dr. W. E. Minor is treasurer and Scaritt, Scaritt, Jones & Miller are counsel. Other directors are R. A. Long, C. A. Braley and W. C. Scarritt. It is proposed to issue \$250,000 of preferred stock and \$900,000 of bonds. These amounts, with \$600,000 already pledged, will bring the total up to \$1,750,000, the amount that the project is expected to involve.

The terminal will occupy a block between Ninth and Tenth Streets, extending through from McGee Street to Oak Street. The tracks will occupy the north half, and a six-story office building, with two-story lobby, will fill the other half. The lobby will be 65 ft. x 200 ft.

## Decision in Milwaukee Coupon Case

Judge E. Ray Stevens of the Dane County (Wis.) Circuit Court decided on Jan. 22 that the order of the Railroad Commission of Wisconsin of Aug. 23, 1912, requiring the Milwaukee Electric Railway & Light Company to sell thirteen tickets for 50 cents was unreasonable. The order was rescinded by the commission in 1915, and the matter under litigation involved the validity of coupons issued with tickets during the time the order was in effect. The face value of these coupons originally issued amounts to \$193,000. Officials of the Milwaukee Electric Railway & Light Company are unable to state whether or not the commission will appeal to the Supreme Court.



## Freight Advance Allowed

**Indiana Public Service Commission Passes Favorably on Appeal of Interurban Railways**

The Public Service Commission of Indiana has granted the petition of the interurban railways to be permitted to increase intrastate freight rates to a point commensurate with the new rate basis of the steam railroads recently authorized by the commission. Hearings were held before the Public Service Commission on Jan. 4 and 5. The electric railways stated that the hauling of freight on their cars was a more expensive proceeding than on the steam railroads, because of varying conditions.

The average increase in freight rates granted by the order of the commission will be 20 per cent. In many instances the rates will be increased, but in some cases they will be decreased. Uniformity of existing rates and the abolishing of certain rate discriminations are also covered in the action of the commission, as was the case with the steam roads. The freight tariffs in effect on the interurban roads were, in general, the same as those which had been in effect on the steam roads prior to the increase granted them by the commission. The commission, in its findings, makes several references to the advantages of shipment by the interurban electric railways as compared with the steam railroads.

ized by the Public Utilities Commission of Illinois to raise its passenger fares to 2 cents a mile, will place on sale commutation books in the denominations of \$2.50, \$5 and \$10.

**Ohio Electric Seeks Higher Rates.**—The Ohio Electric Railway, Cincinnati, Ohio, has filed a new schedule of rates with the Public Utilities Commission. It provides for an increase to 2 cents a mile between certain points and 2½ cents between other points. Feb. 1 is the date set for the new rates to go into effect.

**Owl Service Not Needed.**—The experimenting of two months with owl car operation on an hourly schedule all night on the West Fourth Street and Delaware Avenue lines of the Wilmington & Philadelphia Traction Company in Wilmington, Del., has convinced the company that there is no real need for the service and it will be discontinued.

**Freight Rate Increase Allowed.**—The Public Service Commission of Oregon has issued an order granting the Portland Railway, Light & Power Company a 15 per cent increase in its freight rates, with the exception of wood. Tariffs asking for the increase were filed in October, but they were suspended pending an investigation by the commission.

**Freight Hearing Postponed.**—The Railroad Commission of Texas has postponed to Feb. 13 the hearing which was ordered to be held at Austin relative to charges that have been made before the commission alleging that the interurban electric railways of Texas are now engaged in a freight carrying business. The hearing was ordered following a recent increase in express rates by the interurban lines.

**State Against City in Utah.**—The attorney-general of Utah has announced that he will contest the application made by Salt Lake City to the Supreme Court for a ruling on an order of the Public Utilities Commission of Utah suspending the sale of fifty commutation tickets for \$2. The attorney-general contends that the State law gives the Public Utilities Commission the right to set aside the provisions of a franchise.

**Women in Training in Kansas City.**—The Kansas City (Mo.) Railway has received uniforms ordered for women conductors and is training about twenty women for such jobs. It is understood, however, that at least for the present the government representatives who are looking after labor problems are not encouraging the employment of women. The Public Service Commission of the State is also said to be opposed at present to the employment of women. The applicants for positions will be trained, however, so that if a serious emergency arises they may be ready to go to work.

**Women Proposed for Little Rock.**—In the course of an interview in which he reviewed the strain under which the railway department of the company had been placed on account of the location of a cantonment near Little Rock, the taking of men for war work and in-

creased activity generally, C. J. Griffith, general manager of the Little Rock Railway & Electric Company said: "I have decided the only way out is to get women. I have planned to employ about forty young women and begin educating them as conductors. I believe they will make it possible for us to give better service anyway."

**Some of Mr. Witt's Suggestions Adopted.**—Acting upon the suggestions of Peter Witt, Cleveland, who reported recently to the City Commission of Trenton, N. J., the Trenton & Mercer County Traction Corporation will make a number of changes to its routes through Trenton and build new lines on certain streets and discontinue service on other thoroughfares. The Olden Avenue branch will be discontinued, a line will be built through Bridge Street to the Municipal dock, the line of South Clinton Avenue, from Hamilton to Stanton Street, will be torn up and a new line built on Washington Street to Cedar Lane, a portion of the Market Street division abandoned, the line to Trenton Junction, a distance of 3 miles, abandoned, and loops built at the Clinton Street station and at Cadwalader Park.

**Another Dallas Jitney Ordinance.**—Jitneys in Dallas, Tex., appear to be doomed. Although the Court of Civil Appeals recently decided two cases adversely to the jitneys, they have continued to operate pending appeal to the State Supreme Court in these two cases. The City Commission, however, spurred to action by several serious accidents by jitneys in which one person was killed and several others seriously injured, declared an emergency and enacted an ordinance directed primarily against the jitneys, yet it is all-inclusive and affects private cars as well as jitneys. The ordinance is very stringent in its regulations. It limits the carrying capacity of autos to the seating capacity. The jitney men claim they cannot operate and pay expenses if limited to four passengers per trip, unless they charge a 10-cent fare, and that if they do this they will not be able to compete with the electric railways.

**Government Control Does Not Affect Rate Cases.**—In reply to an inquiry as to whether the Railroad Commission of California would hear on Jan. 24, as scheduled, the applications of the Southern Pacific Company and the San Francisco-Oakland Terminal Railway for authority to raise their ferry and suburban passenger rates at San Francisco, the commission replied in the affirmative. The commission said: "This inquiry is apparently prompted by President Wilson's proclamation of Dec. 26. We have given careful consideration to this proclamation and find nothing therein or in any order issued by the federal government which persuades us that any course other than that originally mapped out should be pursued. Unless developments should make another course necessary, the adjourned hearings in these proceedings will be held on Jan. 24."

## Transportation News Notes

**Chicago "L" Traffic Increases.**—For the six months ended Dec. 31, 1917, the Chicago elevated railroads transported 95,906,970 passengers as compared with 93,167,170 for the corresponding period of 1916, or an increase of 4.1 per cent.

**Appeals Fare Increase Order.**—Commissioners of Cuyahoga County, Ohio, have appealed to the Supreme Court an order of the Public Utilities Commission, allowing the Cleveland & Eastern Traction Company an increase of rates.

**Rate Increase Suspended Until June.**—The Public Utilities Commission of Illinois has suspended until June 1, 1918, a proposed increase in rates by the Central Illinois Public Service Company operating 15 miles of electric railway between Anna and Jonesboro.

**Skip-Stop Plan Adopted at Dayton.**—The City Commission at Dayton, Ohio, has adopted an ordinance providing for the elimination of a number of stops on each line and allowing cars to run at greater speed. The measure was viewed in the light of fuel conservation.

**Commutation Books for Rockford.**—The Rockford & Interurban Railway, Rockford, Ill., which has been author-



## Personal Mention

**W. H. McAloney**, superintendent of rolling stock of the Denver (Col.) Tramway since 1902, has resigned, effective on Feb. 1.

**J. Hulme** has been appointed superintendent of equipment of the International Railway, Buffalo, N. Y., to succeed George Kuhns, transferred.

**Guy E. Tripp**, whose appointment to the ordnance department of the U. S. Army was noted in the *ELECTRIC RAILWAY JOURNAL* for Jan. 19, has received a commission as colonel.

**George Kuhns**, superintendent of equipment of the International Railway, Buffalo, N. Y., has been transferred to the position of master mechanic, a place formerly held by him.

**Emory L. Coblentz**, president of the Hagerstown & Frederick Railway, Frederick, Md., has also been elected president of the Chambersburg, Greencastle & Waynesboro Street Railway, Waynesboro, Pa.

**Edward Schlant**, assistant superintendent of the city lines of the International Railway, Buffalo, N. Y., has been appointed acting city superintendent to succeed T. W. Connette, now in government service.

**Allen G. Hoyt**, New York, N. Y., has been elected chairman of the executive committee of the Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., and a director of the company to succeed Thomas A. Reynolds, resigned.

**W. C. Davidson**, treasurer of the Spokane & Inland Empire Railroad, the United Railways, the Oregon Electric Railway, Portland, Ore., and affiliated lines, will hereafter act as tax agent and all tax matters of the companies will be under his jurisdiction.

**J. P. Morton**, formerly with the Northern Texas Traction Company, Dallas, Tex., will serve as superintendent of transportation of the Eastern Texas Electric Company, Beaumont, Tex., succeeding to part of the duties performed previously by W. V. Neal, resigned.

**E. J. Davis**, local purchasing and claim agent of the Eastern Texas Electric Company, Beaumont, Tex., will hereafter have general supervision over the city and the interurban lines of the company, succeeding to part of the duties heretofore performed by W. V. Neal, resigned.

**W. V. Neal** has resigned as superintendent of the Beaumont (Tex.) Traction Company and the Jefferson County Traction Company, included in the system of the Eastern Texas Electric Company, controlled by Stone & Webster, Boston, Mass., to accept service on one of the firm's other properties. Mr. Neal has been at Beaumont four years. He has served with Stone &

Webster since 1902, with the exception of the time he spent in Europe, China and Japan.

**Thomas W. Connette**, superintendent of the city lines of the International Railway, Buffalo, N. Y., and son of E. G. Connette, president of the company, has been granted a leave of absence and has gone to Washington, where he has received a commission as first lieutenant in the Ordnance Reserve Corps.

**J. C. Daries**, right-of-way and tax agent of the Spokane & Inland Empire Railroad, the United Railways, the Oregon Electric Railway, Portland, Ore., and affiliated lines, will be relieved of his duties as tax agent but will perform, in addition to his duties as right-of-way agent, the duties of sales manager of the Ruth Realty Company.

**H. A. Cowgill**, formerly engineer of maintenance of way of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., has been appointed general superintendent of the Mansfield Electric Light & Power Company, Mansfield, Ohio, and will assume charge of the electric railways of the company. Both properties are controlled by Henry L. Doherty & Company.

**Alexander Lightstone**, supervisor of the United Railways, St. Louis, Mo., has gone on the inactive list of the company through a nervous breakdown. Mr. Lightstone was born in St. Louis. His first work for the company was as a "hill" boy. After some years of service he left the company and was out of railway work for several years. He became a conductor on the Page line in 1892 and was promoted to supervisor in 1900.

**A. C. Woehler**, master mechanic of the El Paso (Tex.) Electric Railway for the last eleven years, has resigned to go into the automobile business for himself. Mr. Woehler has been with Stone & Webster, who control the El Paso property, for more than twenty-four years. He started as a boy in the shops at Houston, and was an engineer at the power house there for some years until he was promoted and sent to El Paso as master mechanic. The employees at the carhouse of the El Paso Electric Company presented Mr. Woehler with a gold watch, chain and charm as a token of their appreciation.

**Edward J. Neary**, electrical engineer with the Public Service Commission for the First District of New York, engaged on rate and capitalization cases, has been granted a leave of absence to accept an appointment as an electrical officer on board the *U. S. S. Utah* with a commission as lieutenant. Mr. Neary was graduated from Pennsylvania State College and has been in the electrical field for the last ten years. Since he

was graduated he has been with the American Gas & Electric Company, the University of Pennsylvania, Henry L. Doherty & Company and the Public Service Commission for the First District of New York.

**William Howard Davis** has been advanced to the rank of supervisor of the United Railways, St. Louis, Mo., in place of Alexander Lightstone, who has gone on the inactive list through a nervous breakdown. Mr. Davis was born in St. Louis forty-four years ago. He went to work for the old Missouri Railway in 1888. When the lines in St. Louis were equipped with electricity Mr. Davis was taken into the Thomson-Houston shops. In 1893 Governor (now Senator) Stone put Mr. Davis on the police force, where he remained until 1905, being promoted in the Mounted District. Preferring electric railway work, he returned to the front platform, and for the last twelve years has been in the third division.

**John J. Dempsey**, who was elected vice-president of the Brooklyn (N. Y.) Rapid Transit Company on Dec. 27, was the guest of honor at a dinner given to him by a number of his friends on Jan. 18 at Delmonico's, New York. About seventy were present and Mr. Dempsey received many congratulations on his elevation to his present office, which completed a number of promotions, beginning with that of advancement from telegraph operator to assistant dispatcher. Joseph K. Choate acted as toastmaster. The first speaker was Colonel Williams, president of the Brooklyn Rapid Transit Company. He referred to Mr. Dempsey as being a "constant cheer, constant inspiration, constant reliance." Others who spoke included H. H. Vreeland, B. A. Hege-man, Jr., E. A. Maher, Jr., H. C. Don-ecker, Dr. E. A. Brennan, LeRoy T. Harkness, attorney for the Public Service Commission, and W. O. Wood.

## Obituary

**William Earle** died recently in St. John, N. B. He was at one time manager of the St. John Street Railway, although latterly he was engaged in engineering work for the Dominion government and the Canadian Pacific Railway.

**B. Frank Hires**, formerly general manager of the Bridgeton & Millville Electric Company and the Millville, (N. J.) Traction Company, died at his home, Bridgeton, N. J., recently. Mr. Hires was connected with the company for eighteen years.

**F. L. Brown**, one of the pioneer merchants of Portland, Ore., and for many years secretary of the Portland Traction Company, now included in the system of the Portland Railway, Light & Power Company, is dead. The Portland Traction Company was a Cali-



fornia corporation and during his service of ten years as secretary of the company Mr. Brown made his home in California. He also represented the Washburn & Moen Manufacturing Company and the American Steel & Wire Company in San Francisco.

Lieut. Gordon D. Cooke, formerly with the McGraw-Hill Publishing Company, Inc., publisher of the *ELECTRIC RAILWAY JOURNAL*, died at the base hospital at Fort Bliss on Jan. 10 from pneumonia. Lieut. Cooke was graduated from the University of Michigan in 1916. As a preliminary training for his work in the field service department of the McGraw-Hill Company he served on the editorial staff of the *Engineering News-Record* for a short period and later took up quarters at his home city, Detroit, Mich. On Sept. 1, 1917, Lieut. Cooke entered the service of the United States at the age of twenty-four, with the commission of second lieutenant in the Engineer Corps. He was temporarily stationed 75 miles from a railroad in New Mexico doing military mapping for the United States Geological Survey.

W. F. Carr, engineer of the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., was instantly killed on Saturday night, Jan. 12, while operating a snowplow on the lines of the Southern Michigan Railway. During the blizzard on Saturday a car containing about fifteen people was snowbound between Niles, Mich., and South Bend, Ind., and Mr. Carr and a crew of men volunteered to rescue these passengers. This they succeeded in doing, after the car had been snowbound for about nine hours. The car was pulled back to a siding and allowed to proceed to South Bend, after which Mr. Carr and his crew returned to the point where the car was stalled to remove the obstruction. A large bank of snow and ice had evidently formed back of the stalled car, so that the snowplow in striking it was thrown from the track and upset. Mr. Carr in falling seemingly struck some part of the car or machinery on his head and shoulders, as the indications were that his neck was broken. The other members of the crew escaped unhurt. Mr. Carr had been in the employ of the company only a few months, but during this time all his associates had learned to admire and love him. He was a man of fine character and exceptional ability as a maintenance engineer. He was always considerate of the welfare of others, as is shown by his willingness at this time to risk his own life for their comfort. Previous to his last connection Mr. Carr was for seven and a half years engineer of maintenance of way of the Chicago, Ottawa & Peoria Railway at Ottawa, Ill., which is a part of the Illinois Traction System. As engineer of the Chicago, South Bend & Northern Indiana Railway he had supervision of all roadway, track, bridges and buildings, and also acted as consulting engineer for all departments. A biography and a portrait of Mr. Carr were published in the *ELECTRIC RAILWAY JOURNAL* for Nov. 10, 1917, page 883.

## Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (\*) indicates a project not previously reported.

### Recent Incorporation

\***Montgomery Transit & Light Company, Norristown, Pa.**—Incorporated under the laws of the State of Delaware to construct and operate railways and light plants. Capital stock, \$1,000,000. It is understood that the new company is organized to take over the Montgomery Transit Company which operates a line from Norristown to Harleysville, 13 miles.

### Franchises

**Los Angeles, Cal.**—The Railroad Commission of California has authorized the Pacific Electric Railway to construct a track across East Ninth Street, East Eighth Street and a part of Long Beach Avenue. The company was also authorized to build a turnout in Sixteenth Street between Arlington Street and Second Avenue and a track in Lake Shore Avenue and across Montana Street, Berkeley Avenue and Alvarado Street.

**Venice, Cal.**—An ordinance will be prepared by the City Trustees of Venice offering for sale the franchise to operate cars along the Ocean Front in Venice.

### Track and Roadway

**Muscle Shoals Traction Company, Florence, Ala.**—It is reported that Frank L. Davies, Danville, Ill., has become interested in the plan to construct an electric railway from Huntsville to Florence, about 64 miles, and will undertake its promotion. [Aug. 11, '17.]

**Clear Lake Suspended Monorail Company, Hopland, Cal.**—It is reported that the Clear Lake Suspended Monorail Company has awarded a contract to G. L. Hardison, San Francisco, for grading, bridging, track-laying, buildings, fencing and installing equipment on its proposed line from Hopland to Lakeport at \$532,000. [Dec. 1, '17.]

**Municipal Railway, San Francisco, Cal.**—Bids will be received by the Board of Public Works until Jan. 10 for the double-tracking of Market Street, from Van Ness Avenue to Third Street. It is estimated that the cost will be about \$120,000.

**Miami, Fla.**—Bids are being asked by the commissioners of Dade County for the construction of two steel bascule bridges in Miami Causeway, one on the east and one on the west side of Biscayne Bay. Each bridge will be 140 ft. long and consist of double-leaf bascule span providing a 60-ft. clear waterway and steel approach span on each end. The bridge will provide for roadways 20 ft. wide, sidewalk 5 ft. wide and electric railway track outside of roadway. Klyce & Kackley, Townley Building, Miami, engineers.

**Indianapolis Traction & Terminal Company, Indianapolis, Ind.**—The Board of Public Works of Indianapolis has rescinded an order requiring the Indianapolis Traction & Terminal Company to build and maintain a crosstown line from Virginia Avenue across South Street to Kentucky Avenue to the Union Stock Yards.

**Southwest Missouri Railroad, Webb City, Mo.**—It is reported that the Southwest Missouri Railroad has taken over the Oklahoma, Kansas & Missouri Railroad, which operates 14 miles of road, and will electrify the line. Work on the company's line into Baxter Springs, Kan., is being rushed, while the grading of the line from Baxter to the connection with the Oklahoma, Kansas & Missouri Railroad is being hurried along. It is expected that by May 1 cars will be making hourly trips between Miami, Okla., and Carthage, Mo.

**Butte (Mont.) Electric Railway.**—City Attorney George Toole has been asked to decide whether it will be legal for the Butte Electric Railway to double-track its line on Main Street, from Quartz to Park Street. A petition to lay double-track was presented to the City Council recently by the company, with the object in view of better service between Butte and Walkerville and Butte and Centerville.

**Manchester Traction, Light & Power Company, Manchester, N. H.**—This company has purchased the water rights connected with the United States Bobbin & Shuttle Company, giving the company all the water privileges that are desirable from the mouth of the river in Manchester, where it empties into the Merrimac River and the village of Goffstown.

**New York Municipal Railway Corporation, Brooklyn, N. Y.**—A contract has been awarded by the New York Municipal Railway Corporation to the Federal Signal Company, Albany, for the installation of an a.c. electric interlocking plant with a.c. track circuits at the Jamaica terminal of its elevated system.

**Manila Electric Railroad & Light Corporation, Manila, P. I.**—Extensive improvements are being contemplated by the Manila Electric Railroad &



Light Corporation during the next five years, including the construction of new tracks, new track terminals, reconstruction of old tracks and the reconstruction of the overhead system.

**Chattanooga (Tenn.) Traction Company.**—A contract has been accepted by the Chattanooga Traction Company to operate cars over the new bridge at Chattanooga for five years.

**Dallas (Tex.) Railway.**—Two hundred and fifty tons of rails to be used in the improvements and extensions of the Dallas Railway Company's tracks in the city of Dallas have been shipped from Lorain, Ohio, on Jan. 2. The shipment is expected to arrive in Dallas by Feb. 1, according to Richard Meriwether, general superintendent and general manager. The total of 1200 tons of rails was ordered, but the mills at Lorain could not fill the entire order at one time. The rails now en route to Dallas will be used in double-tracking the Colonial Avenue line, and work will begin as soon as the rails arrive.

**El Paso (Tex.) Electric Railway.**—This company will double-track its line between Cotton Avenue and Piedras Street, putting in one switch between the El Paso and Southwestern crossing and Cotton Avenue and two more between the El Paso & Southwestern rails and Piedras Street at a cost of \$25,000.

**Houston, Tex.**—It is reported that the City Council of Houston has prepared specifications for the construction of a municipal belt line in Houston. E. E. Sands, city engineer.

**Puget Sound Traction, Light & Power Company, Seattle, Wash.**—In order to obtain better transportation facilities for the thousands of workmen in the shipyards and other industrial plants in the Harbor Island District of Seattle, the West Side Commercial Club of West Seattle is starting a campaign to secure increased street car service. One of the first moves will be to endeavor to induce the Puget Sound Traction, Light & Power Company to build a line from the present Alki line over Avalon Way to relieve some of the congestion on the single-track Fauntleroy line through Youngstown. An experiment with a jitney bus is being tried on the Alki Avenue line, and in the event that other means to solve the transportation problem fail, it is possible that jitneys may be installed on the other lines to supplement the street car service.

**Seattle (Wash.) Municipal Railway.**—Before Feb. 1 cars will be operated by the Seattle Municipal Railway, from Third Avenue and Pine Street across the Salmon Bay bridge at Fifteenth Avenue N. W. to the north city limits at Thirty-second Avenue N. W. and West Eighty-fifth Street, a distance of about 6 miles. Operation from Twenty-third Avenue N. W. and West Sixty-seventh Street will be over the old Loyal Heights line, which will form a link with the downtown line known as Division A. The Central Labor Council plans a celebration on the occasion of the opening of the city car line.

## Shops and Buildings

**Georgia Railway & Power Company, Atlanta, Ga.**—An interurban passenger station will be built by the Georgia Railway & Power Company at Camp Gordon.

**Chicago, Milwaukee & St. Paul Railway, Chicago, Ill.**—The construction of freight house at Roundup, Mont., is being contemplated by the Chicago, Milwaukee & St. Paul Railway next spring, to cost approximately \$40,000.

**Galesburg Railway, Lighting & Power Company, Galesburg, Ill.**—Stables owned by the Galesburg Railway, Lighting & Power Company at Galesburg were recently destroyed by fire. The loss is estimated at about \$6,000.

**Trenton & Mercer County Traction Corporation, Trenton, N. J.**—The Trenton & Mercer County Traction Corporation is having its carhouse, recently damaged by fire, rebuilt. Repair parts for the cars that were burned are slow in arriving owing to transportation conditions.

**Lawton Railway & Lighting Company, Lawton, Okla.**—A new carhouse is being built by the Lawton Railway & Lighting Company on North Second Street.

**Texas Electric Railway, Dallas, Tex.**—It is reported that the Texas Electric Railway will construct a passenger station and repair shop at Denison.

## Power Houses and Substations

**Fort Smith Light & Traction Company, Fort Smith, Ark.**—A contract has been awarded the Fort Smith Light & Traction Company for furnishing an ornamental lighting system on Garrison Avenue for a period of ten years.

**Arkansas Valley Railway, Light & Power Company, Pueblo, Col.**—Work has been begun by the Arkansas Valley Railway, Light & Power Company on the construction of a transmission line to serve Penrose.

**Shore Line Electric Railway, Norwich, Conn.**—A new power house will be built by the Shore Line Electric Railway in Thamesville. Orders have been placed for two 10,000-kw. turbines. The contract calls for the delivery of one turbine in May and the other in June, and it is expected that the plant will be in operation by Oct. 1.

**Trenton & Mercer County Traction Corporation, Trenton, N. J.**—The Trenton & Mercer County Traction Corporation is erecting foundations at its Lincoln Avenue powerhouse for the installation of a new 2000-hp. engine and generator.

**Manila Electric Railroad & Light Corporation, Manila, P. I.**—Among the improvements contemplated by the Manila Electric Railroad & Light Corporation is the installation of a new 5000-

kw. turbo-generator and other special power plant equipment which will increase the electric generating capacity of the plant about 50 per cent, or from approximately 10,000 kw. to approximately 15,000 kw.

**Montreal (Que.) Tramways.**—A new 1500-kw. motor-generator set has been installed by the Montreal Tramways in its William Street power house. This is the last of four units ordered from the Canadian General Electric Company. One of these units has been installed at the St. Henry substation and two others at the St. Denis substation.

**Dallas (Tex.) Railway.**—The contract providing for the exchange of power between the Dallas Power & Light Company and the Texas Power & Light Company, has been approved by the City Commission. The contract as originally submitted to the supervisor of Utilities called for an expenditure of \$350,000 for transmission lines and transforming apparatus, but concessions have been made which will save the local company a total of \$130,000. The contract covers the purchase of 3000 kw. with an increase to 5000 kw. Under the agreement the Dallas company will furnish energy to the Dallas Railway Company for the Oak Cliff and East Dallas lines, which is now supplied by the Northern Texas Traction Company.

**Virginia Railway & Power Company, Richmond, Va.**—This company will construct an electric transmission system from Petersburg to Suffolk.

**Puget Sound Traction, Light & Power Company, Seattle, Wash.**—The Puget Sound Traction, Light & Power Company, has under way additions to its White River or Lake Tapps hydro-electric generating station and its Georgetown steam plant that will permit of a total increase of 36,400 additional horsepower with which to serve the industrial needs of Tacoma and Seattle. Last April construction was begun on the installation of a 23,000 hp. generating unit at White River in addition to the two generators already in operation there, each of which has a capacity of 20,000 hp. This new unit will be in operation by March 1, next, giving the White River plant a total capacity of 63,000 hp. at that time. In addition to this a 13,000 hp. generator will be installed at the Georgetown steam plant and this additional capacity will be in operation by summer. When this development is completed the company's hydro-electric plants supplying Tacoma and Seattle with power for industrial needs will have a combined capacity of 107,997 hp.

**Appalachian Power Company, Bluefield, W. Va.**—Details have been decided upon by the Appalachian Power Company for its proposed steam-driven electric generating plant at Glen Lyn, Va. The building will be 150 ft. x 150 ft., of concrete, brick and tile, with provision for an extension to provide an ultimate capacity of 75,000 kw. The initial installation will be 18,750 kw. The power house and equipment will cost about \$2,000,000.



# Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

## Condition of Pacific Coast Roads Improving Slightly

**Freight Traffic Has Not as Yet Created Demand for Equipment—Deliveries Longer Except Steel Products**

The condition of electric railways on the Pacific Coast seems to be slightly improved with the advent of the new year. At least there are more encouraging aspects on several of the matters of vital importance to the industry. In Portland a six-cent fare has been allowed by the Public Utility Commission and there are indications that a similar move may materialize in the Puget Sound district. The freight business continues to grow and passenger traffic keeps up in splendid shape considering the fact that it is wartime and winter season. Some roads have been able to cut operating costs by rearranged schedules or different equipment, and war conditions have helped materially in the fight against the jitney.

On the other hand, the municipal ownership idea is not only growing rapidly, but is continually spreading into new quarters, and the financial conditions of the roads has been so long depressed that the freight business or other revenue sources must continue for some time before there can be anything like retrenchment. Even those roads which are enjoying the most of the freight business have not placed orders for any considerable amount of equipment or materials on account of it, although dealers say they still hope for such action.

Since the new year, the demand for such supplies and materials as are used in maintenance and replacements has strengthened notably, but in these lines the demand is spasmodic, so that no special significance attaches. The first California one-man cars to be put in regular city service have been received at Sacramento and four are to be put in operation this month. The Oakland, Antioch & Eastern Railway is reconstructing a few miles of track, and several companies are rehabilitating portions of the system where extensive maintenance has for some time been deferred, but in general little construction work is being done—practically none on new lines.

The Pacific Coast tendency is to order direct from Eastern stocks and immediate delivery from Coast warehouses is not expected. There are so many different electric railway standards that carrying Coast stocks is expensive, and, in some cases, adds 5 to 20 per cent. to cost on account of charges incurred in handling twice, storing and carrying overhead on un-

sold stock. Thus at least the larger purchasers foresee needs sufficiently to place orders in advance long enough to allow for Eastern delivery. On consignments less than 100 lb. by express shipment, delivery is made within a week, and ordinarily freight has required only thirteen to seventeen days. This has now increased to three to four weeks, however.

Deliveries are in fairly good shape except for certain steel products. It is pointed out that many firms which manufacture certain electric railway specialties have only small plants not engaged in government work and have, consequently, not been affected by war orders. About six weeks is the factory time now quoted on a large part of the railway supplies, although three to four months is the average for railway motors; seamless trolley poles are indefinitely delayed, and gears and pinions are rated at nine to ten months.

Prices have shown a tendency to fluctuate, but only a few actual advances have been listed in the past month. Among these are trolley rope and car seats. A slight decrease in car wheels is expected in different quarters of the trade.

## Certain Line Materials Advance in Price

**One Hardware Line, However, is Lower by 10 Per Cent Because of Stock Accumulation**

Prices on line material, which have been abnormally high, have been reduced by an Eastern producer 10 per cent, effective Jan. 15. This manufacturer of hardware had accumulated a surplus stock, and reports say he was obliged to lower his figures to reach a market.

This reduction does not apply generally, and quotations are still high in other directions. Locust pins are still scarce, with prices \$2.50 a thousand higher than previously quoted, effective as of Jan. 15; but this, too, is an exceptional case. Different mills name varying prices, according to location and stock on hand. Rock elm pins are being mentioned as coming into use as a substitute for locust, on account of the scarcity and cost of the latter.

High voltage porcelain insulators have been marked up 10 to 12 per cent within a few weeks, but the low-voltage type remains untouched. Stocks appear to be none too plentiful, while deliveries are slow. High-voltage grades are back four months, caused by slowness of production and delivery, but low-voltage insulators are in a slightly better position.

## Effect of the War on Safety Device Market

**Trend of Events Indicates that Greater Precautions Will Be Taken to Protect Workers**

As the result of the knowledge of the vast sacrifices of human life in the war the minds of business men in this country have undoubtedly become accustomed to and inured against shocks from reports of sudden death or physical disablement. Such a transition in mental processes might reasonably be expected to harden the industrial executive against movements for greater safety in the conditions surrounding plant employees. The facts are, however, that this is not the case. The exact opposite appears to be true. Undoubtedly the reason for this condition is the belief, now practically established, that safety movements are not a matter of sentiment, but are a matter of good business judgment. It has been found a paying investment to spend money to prevent accidents.

That this is the case is evidenced by the increased business among concerns making safety appliances and concerns marketing consulting safety services. Likewise the increased interest in safety movements since the war brought about the present labor shortage is evident through the same channels. The safety device manufacturers generally are very busy. Some have more business than they can handle. When a group of these manufacturers recently met to discuss an annual convention and exposition for 1918 the interest in this event was intense. The National Safety Council of Chicago showed in its recent annual report that its membership had increased 68 per cent in the last year, which means that 1447 industrial and public utility concerns subscribed for consulting safety service in that fiscal year and that the workmen reached by this body then had reached a total of 4,500,000. Shipbuilding plants and others engaged in government business are among latest groups to study and apply accident prevention methods.

In spite of this increased effort, accidents in the last year have slightly increased. This has been caused by the immense labor turnover, necessitating the employment of many "green" men. Leading authorities in safety work say, however, that the number of accidents would have increased at a more marked rate under the existing conditions had it not been for the continued effort to prevent them. This growth in accidents is another factor which has contributed to make the safety-device manufacturer's business active.



## Demand for Second-Hand Rolling Stock

**Traction Companies All Over the Country Have Difficulty in Getting New Cars—Used Equipment Scarce and High**

It is generally known that the builders of new cars are in no position to accept orders for rolling stock for quick shipment, and that deliveries are considerably longer than under normal conditions. In fact, instances have been reported where roads have decided not to place orders with deliveries so far off.

For this reason many traction roads, either because of increased traffic due to greater industrial activity, or being in the vicinity of an encampment or shipyard, or because of demands of the municipality, having found it absolutely necessary to obtain additional cars, have gone into the market for second-hand rolling stock. But now even this source is greatly restricted. This condition was recently revealed most emphatically by inquiries for second-hand cars coming from a number of traction companies. Some of these, it is known, had got in touch with the car builders, and ascertained the facilities of the plants for car construction were curtailed in almost every instance, by government work of one kind or another.

Much to the surprise of the inquirers it was found this description of rolling stock was none too plentiful. The Little Rock (Ark.) Railway and Electric Company is one of these companies. Charles L. Griffith, general manager, is reported as saying: "We have been trying to get cars from Philadelphia and St. Louis, but the car construction shops there are working for the government. I have been all over the country trying to purchase second-hand cars. I succeeded in 'roping in' six. These were only partly equipped."

Another instance is that of the Richmond Light & Railroad Company, operating on Staten Island, New York City. With the establishment of several large shipyards on the north shore engaged in Emergency Fleet Corporation contracts, the road was suddenly called upon to furnish transportation facilities, to and from their daily work in the yards, of a greatly augmented corps of workmen. This it was unable to do without acquiring more rolling stock and other equipment. It being out of the question, for various reasons, to obtain new cars the company scoured the country for second-hand passenger equipment. As a result of the search twenty cars were located in Boston. The price asked, however, rather astonished the prospective buyers, as the Boston people wanted \$6,000 to \$7,000 each, a figure the Staten Island company reported to the Public Service Commission of New York was 20 per cent higher than that of new steel cars when prices were normal.

It is clear, therefore, that with railway companies looking for second-hand rolling stock in lieu of new, because of the inability of car builders to make deliveries, the situation is referred to as serious. Apparently the supply of used cars is also limited, and this further

emphasizes the critical condition. The demand for used stock is large and cars reported on the market find inquiries quickly.

The Brooklyn (N. Y.) Rapid Transit Company (New York Municipal Railway Corporation) a short time ago offered for sale, through a prominent railway equipment concern, a number of used wooden cars, suitable for inter-urban service. A great many inquiries were received from all over the country, and while none of these cars have been sold yet, because they are still in service, present indications are that they will be absorbed by other roads immediately on their release.

### Government Copper Price Continued

**President Extends 23½-Cent Price Until June 1 on Certain Conditions Making for Maximum Production**

On recommendation of the War Industries Board President Wilson on Tuesday extended until June 1 the price of 23½ cents a pound for copper fixed on Sept. 21.

The maximum price was ordered continued on the following conditions: That wages be not reduced, that the producers sell to the Allies and the public copper at the price paid by the government, that necessary measures be taken under the direction of the War Industries Board to prevent copper from falling into the hands of speculators who would increase the price to the public, and that the producers exert every effort to keep up the production to the maximum of the past so long as the war lasts.

### Method of Paying for Government Contracts

**Under Certain Conditions Manufacturers Will Be Paid for Raw Materials Prior to Manufacture**

It has not been particularly clear in the minds of some members of the manufacturing group how the government proposes to pay for the goods it buys. In a proposal recently issued for large quantities of electrical goods the General Engineer Depot made the following statement regarding payment:

"Payment will ordinarily be made for each item as soon as it has been inspected, accepted and delivered, properly packed, (f.o.b. cars or boat) at place stated in proposal. Under certain conditions, in the case of standard products the sufficiency of which in their completed form is already known from previous use, partial payments to the extent of a previously agreed upon percentage of the total cost of each component part of the article to be furnished will be made when such component parts are known to be on hand

in the factory ready for assembly. Such component parts will then become the property of the United States, and are to be safeguarded by the manufacturer in a way acceptable to the purchasing officer, in order to prevent loss to the United States through destruction or theft of same."

### Rolling Stock

Little Rock Railway & Electric Company, Little Rock, Ark., has recently purchased six second-hand cars, partly equipped.

Tranvias de Oriente, Bogota, Colombia has ordered one five-bench open storage battery car from the Railway Storage Battery Car Company, New York, N. Y.

International Railway, Buffalo, N. Y., lost 100 cars in a fire on Jan. 23 that destroyed the Forest station of the company. The property loss is unofficially placed at \$1,000,000.

Trenton & Mercer County Traction Corporation, Trenton, N. J., has been recommended by Peter Witt, in his report to the City Commission of Trenton, to purchase fifty one-man cars.

United Railways of Yucatan has ordered three 55-ft. all-steel passenger battery cars and two 27-ft. trail baggage and express cars from the Railway Storage Battery Car Company, New York, N. Y.

Illinois Traction System, Peoria, Ill., on Jan. 9 had another motor destroyed at Staunton by fire, its value being given at \$7,000. This makes five cars lost by the company through the same cause in three weeks.

Valdosta (Ga.) Street Railway is reported as rebuilding a recent purchase of cars from the Waycross Street & Suburban Railway, Waycross, Ga., in its own shops, adding automatic air brakes and other improvements.

Compania de Tranvias de Merida, Merida, Mexico, has ordered one twenty-six-passenger, four-wheeled, city-type closed storage-battery car and one five-bench open storage-battery car from the Railway Storage Battery Car Company, New York, N. Y.

Richmond Light & Railroad Company, Borough of Richmond, New York, N. Y., is reported to be in the market for second-hand cars, to increase its transportation facilities to the newly-established government shipyards on the north shore of Staten Island.

Union Traction Company of Indiana, Anderson, Ind., a few weeks ago had an interurban motor car destroyed by fire near Fairmont, Ind. The car caught fire from resistance coils while the motorman was endeavoring to run through a 4-ft. snow drift. Another car of the same description caught fire in the same manner on the same day near Pendleton, Ind., but the damage was limited to the destruction of the floor.

Manila Electric Railroad & Light Corporation, Manila, P. I., will build



fifteen new cars and rebuild a number of old ones in its own shops. The trucks and equipment will be purchased in the United States. New tracks and terminals, with the reconstruction of the overhead trolley system, are further improvements decided upon as the result of a visit to Manila in November last of J. H. Pardee, president, and J. P. Ripley, engineer of the J. G. White Management Corporation, New York, N. Y., which controls the property.

Tri-City Railway Company, Davenport, Iowa, is remodeling four of its summer cars for use in the present winter season, on account of the increased traffic, due largely to the government's activity at the Rock Island (Ill.) arsenal. The company recently purchased twenty summer passenger cars from the Chicago surface lines, which will be rebuilt in Chicago and promised delivery within thirty days. The cars will be distributed among the cities of Davenport, Iowa; Rock Island, Moline, East Moline and Silvis, Ill. The Tri-City Railway Company is attempting to find other cars which may be for sale.

**Trade Notes**

Baldwin Locomotive Works, Philadelphia, Pa., has appointed A. P. Beuter, in place of A. William Hinger as its representative in Portland, Ore.

C. P. Coleman was elected president of the Worthington Pump & Machinery Company of New York City at a meeting of the board of directors on Dec. 31, 1917.

Johnson Coin Counting Machine Company, New York, N. Y., has moved its Eastern sales office, wrapper and repair departments to 237-239 Lafayette Street, New York.

J. C. Manchester is now district sales manager for the Economy Fuse & Manufacturing Company, San Francisco. Mr. Manchester was formerly connected with the Interstate Electric Novelty Company in that city.

The Esterline Company, Indianapolis, Ind., announces the appointment of J. S. Pandiani, Via Mario Pagano, 27 Milan, Italy, as trade representative for

that country. Mr. Pandiani was until recently manager of the meter and supply department of the Italian Westinghouse Company and will in the future give his attention to the sale of Esterline instruments and permanent magnets throughout Italy.

Nelson P. Hall has taken up the duties of district sales manager for the Chicago territory of the Van Dorn & Dutton Company, gear specialist, of Cleveland, Ohio. His offices are at 14 East Jackson Boulevard.

H. H. Hoxie, sales manager of the Electric Railway Manufacturers' Supply Company, has resigned to become associated with the North Coast Electric Supply at Seattle, Wash., of which Harry Byrne is manager.

The Australian General Railway Signal Company, of Gates, N. Y., has been chartered with a capital stock of \$10,000 by J. S. Fitch, H. Satterlee and L. A. Plumb of Rochester. The company proposes to manufacture railway signals, etc.

William F. Montavon, United States Commercial Attaché at Lima, Peru, advises the Department of Commerce that he has immediate use for catalogs of railway equipment and construction material, and requests that they be forwarded to his office at once.

Moloney Electric Company of Canada, Ltd., Toronto, Canada, announced that it opened a branch office and warehouse at Halifax, N. S., for the maritime provinces. E. A. Seath, who has been transferred from the Montreal office, will have charge of that territory.

Frank J. Foley, manager of the mining section of the industrial department of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has taken a position as manager of the mining and traction department of the Edison Storage Battery Company, Orange, N. J. Mr. Foley, who is a graduate of Pratt Institute, Brooklyn, N. Y., has been with the Westinghouse company for twelve years, commencing with the service department in New York City and later being transferred to East Pittsburgh.

Frank W. Hall has been appointed commercial manager of the Sprague Electric Works of the General Electric Company, New York City. With the exception of a short period Mr. Hall has been connected with the Sprague

Works continuously for twenty-two years in various engineering and sales capacities, and for the three years prior to his present appointment occupied the position of sales manager. D. C. Durland, former executive head of the Sprague Electric Works, has resigned to accept the presidency of the Mitchell Motors Company, Inc.

Western Electric Company, New York, N. Y., will remove the clerical force and heads of departments of its distributing staff from 483 West Street, its present location, to the sixteen-story building on the north side of Twenty-first street, running from Broadway to Fifth Avenue, about the middle of February. The company will occupy the thirteenth, fourteenth, fifteenth and sixteenth floors, comprising an area of about 45,000 sq. ft. The engineering staff requested more room in the West Street building, which necessitated the acquirement of additional quarters.

Cornell S. Hawley, past president of the American Electric Railway Manufacturers' Association, has returned to active connection with the electric railway field, having recently been elected managing director of the Consolidated Car Heating Company, New York, with headquarters at Albany. Mr. Hawley was recently treasurer of the Remington Arms & Ammunition Company, but has completed the work there for which he primarily took the position. Prior to that time he was president of the Laconia Car Company. For many years, however, he was very closely associated with the Consolidated Car Heating Company, whose sales organization might be said for a long time to have represented his active personality. Mr. Hawley's many friends will welcome his return to the electric railway industry.

**New Advertising Literature**

Vulcan Steel Products Company, New York, N. Y.: The company's illustrated house organ, *Vulcan*, published monthly, is a journal of co-operation and help. The topics discussed cover a wide field, referring more particularly to the export trade, in which it is strongly represented in all the leading centers of the world.

**RAILWAY MATERIALS**

	Jan. 16	Jan. 23
Rubber-covered wire base, New York, cents per lb.	30	30-33
Wire, weatherproof (100 lb. lots), cents per lb., New York	34 1/2-35 1/4	34 1/4-38 1/4
Wire, weatherproof (100 lb. lots), cents per lb., Chicago	38-38.35	33 1/2-38.35
Rails, heavy, Bessemer, Pittsburgh	\$55.00	\$55.00
Rails, heavy, O. H. Pittsburgh, per gross ton	\$57.50	\$57.00
Wire nails, Pittsburgh, per 100 lb.	\$3.50	\$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	\$3.90	\$3.90
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.	\$3.95	\$3.95
Cement (carload lots), New York, per bbl.	\$2.22	\$2.25
Cement (carload lots), Chicago, per bbl.	\$2.31	\$2.31
Cement (carload lots), Seattle, per bbl.	\$2.63	\$2.63
Linseed oil (raw, 5 bbl. lots), New York, per gal.	\$1.29	\$1.31
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	\$1.30	\$1.32
White lead (100 lb. keg), New York, cents per gal.	10	10
Turpentine (bbl. lots), New York, cents per gal.	48 1/2	51

**NEW YORK METAL MARKET PRICES**

	Jan. 16	Jan. 23
Copper, ingots, 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.	6 1/2	7
Lead, cents per lb.	50	50
Spelter, cents per lb.	8	7 87 1/2
Tin, Straits, cents per lb.	85.00	*86.00
Aluminum, 98 to 99 per cent, cents per lb.	35-37	34-36

**OLD METAL PRICES—NEW YORK**

	Jan. 16	Jan. 23
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.	13 1/2	13 1/2
Lead, heavy, cents per lb.	5 3/4	5 3/4
Zinc, cents per lb.	5 1/2	5 1/2
Steel car axles, Chicago, per net ton	\$42.42	\$42.42
Old carwheels, Chicago, per gross ton	\$30.00	\$35.00
Steel rails (scrap), Chicago, per gross ton	\$35.00	\$35.00
Steel rails (relaying), Chicago, per gross ton	\$60.00	\$60.00
Machine shop turnings, Chicago, per net ton	\$17.50	\$17.50

\*Nominal.