Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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This Conference Should Help the Electric Railways

THE conference at Atlantic City next week of representatives of the nation's industries to consider reconstruction problems promises to be of as much interest to public utilities as to manufacturers. It is true that the reconstruction problems of the electric railways, at least superficially, are different from those of most manufacturers. Thus, the electric railways have no partially-filled government orders for material; they are not looking forward to export business; tariff questions do not affect them directly, and they are not worrying greatly about possible increases in the excess profits tax.

Nevertheless, electric railways are concerned with a number of the questions to be considered in any plans for the reconstruction or readjustment of our nation's industries as a result of the termination of the war—for example, the future of some of the war agencies which the government established during the war period, such as the War Industries Board, the War Labor Board and the Capital Issues Committee. Electric railways are also interested directly as well as indirectly in the conditions under which the labor market will be brought from a war to a peace basis as well as the conditions under which prices will be determined for steel, copper, coal and other like materials. For this reason, it is very important that any plans for reconstruction of our industries should include plans by which the electric railways of the country may be put on a fundamentally sound basis for operation and development, and we hope that the industry will be well represented at the Atlantic City convention.

Municipal Threats Constitute a Cost of Service

IT IS a lamentable state of mind for electric railway investors to be in—to desire security of principal and stability of income, and at the same time to be kept constantly aware of conditions which threaten both these requisites of a sound investment. The public, however, is in a worse state, for it does not sufficiently realize how much it is hurting itself by causing the existence of such conditions.

"Menace in itself is a cost of service." Thus the idea is succinctly phrased by the public service securities committee of the Investment Bankers Association of America, in an interim report noted elsewhere. The imposition of inequitable tax burdens, attacks by municipal demagogs, interference with business-like operation, reluctance of commissions to meet the rate situation squarely, a foolish effort on the part of cities to depreciate utility values—all these constitute a menace for which the investor requires the public to foot the bill.

How? First, because the only way the investor, in the presence of such risks, can be attracted to support even in a halting fashion the maintenance and development of a railway is through the payment of high rates on his loans. Second, because the payment of these high rates in itself is bound in time to restrict the utility service to the community if the public threats continue, for it will be increasingly difficult for the public to provide the receipts necessary to yield the large returns required on new investments.

Hence the more the public menaces railway prosperity, the more the public must pay for railway growth and the less likely the railway will be allowed to expand as it should. If the public wants to keep fares down and improve service, let it show an inclination to guard legitimate utility investments and prevent the imposition of unfair restrictions and burdens. A policy of fair dealing is the only one that pays in the end.

Putting the Safety Idea Into Tangible Form

THE men in attendance at the fall meeting of the Central Electric Railway Association at Indianapolis last week expressed themselves as greatly pleased by the graphic way in which R. N. Hemming, of Fort Wayne, Ind., put the idea of safety. In his accident-prevention work Mr. Hemming finds that the term "safety first" is pretty much played out and that there is need for new and striking methods if conviction as to the necessity for carefulness is to be maintained and intensified.

To apply this principle he adopted a number of ideas presented at the recent National Safety Congress and others developed in different parts of the country, producing the allegory of the "grim reaper," the premier appearance of which was made at the Indianapolis meeting as mentioned last week. In spite of the novelty of the performance it was given and witnessed in all seriousness due to the earnestness of the performers. It will soon be familiar to the general public served by the lines of the Fort Wayne & Northern Indiana Traction Company.

There is one important factor in the accident reduction movement, namely, that it is difficult to make the idea interesting unless those back of the movement are enthusiastic and are willing to exert constant effort to adapt themselves to the audiences which they desire to reach. No perfunctory work in this line will "get across." The statistics of accident casualties are startling enough, and it is easy to convince people that casualties can be reduced. But it is difficult to enlist the

active personal co-operation of the individual in promoting his own and his neighbor's physical safety. Everybody seems willing, personally, to take a chance, many seem even to enjoy it. For this reason the best of talent must be employed. It is true also that electric railways are on the whole quite safely operated. They must, however, take a leading place in the movement because they occupy a conspicuous place in the community and because the inculcation of general carefulness will react favorably on their own casualty records.

Straight-to-the-Point Advice to the Interurbans

THE interurban electric railways of the United States have indeed, as Mr. Laney told the C. E. R. A. convention last week, been asleep at the switch as far as freight traffic is concerned. While there is doubtless ground for differences of opinion as to the extent to which motor trucks have already captured all the available business, no one can well dissent from the proposition that the interurban lines have seriously neglected the development of freight traffic. They taught the public the value of service, but they applied the lesson almost exclusively to passenger traffic.

In urging the railways to make up for past inaction, Mr. Laney made concrete suggestions of two general sorts. One set had to do with the electric lines; the other concerned the motor trucks. In the first instance, he advised the railways, for example, to stop consoling themselves with the belief that the motor trucks will not survive on account of the absence of return loads and the heavy operating expenses. This is sound commonsense. Motor-truck operators are not wasting time in saying that return loads cannot be secured—they are going after them with enthusiasm. As for the expenses, these are undoubtedly heavy, but electric railway officials, of all people, should know that in the early stages of any common carrier the experimenters are not deterred by poor results from trying to work out the proper line of development for their industry.

Furthermore, Mr. Laney suggested that the interurban railways put more life into their traffic departments, find out why motor-truck transportation makes an appeal in their territories and apply a consistent remedy. If motor people by an aggressive campaign are "selling" the idea of their service to the public, only one course lies open to the railways—they must employ similar methods. The merchant who merely condemns the other man for advertising is committing business suicide.

The second set of suggestions was based on the premise that the motor truck is to continue in existence. This is admitted. We have said repeatedly that the motor-truck industry has a field for real service in handling drayage and short-haul traffic and that such service need not and should not mean competition with electric lines. In justice to all parties, however, the motor trucks should be regulated so as to prevent rate discriminations and excessive road wear, and they should be required to contribute toward highway maintenance. An energetic, organized effort should be made to accomplish these ends. Destructive competition between public servants would be the height of folly in these days of national reconstruction.

Does Cold Weather Increase the Drag on the Power House?

WE HAVE ALWAYS thought that there was a relation between the energy consumption of the motors of a car and the weather, but our thought has been as much a happy guess resulting from qualitative observations as a scientific opinion based on actual figures. The article by M. B. Rosevear, published elsewhere in this issue, presents some interesting information regarding the matter.

From many years it has been standard steam railway practice to decrease, in winter time, the tonnage ratings of the locomotives by a certain percentage, the actual decrease depending on the locality. But in spite of several elaborate tests there has always been more or less dispute as to how much of this decrease is chargeable to lowered locomotive efficiency and how much to increased train resistance. At any rate, no good steam railway man would think of using "summer oil" in the winter time. Electric railway men who have had anything to do with the experimental determination of the train resistance of electric cars have also noted a decrease in the train resistance as the bearings warmed up, and, in some instances for certain equipments and conditions, this decrease has been determined with a fair degree of accuracy. Mr. Rosevear's article, however, is the first that has come to our attention of a "system" study of the question based on data accumulated through a long period of operation.

It is interesting to analyze a little further some of the data presented. For example, since the power-saving campaign of the Public Service Railway had not yet been started in 1917, let us compare the average energy consumption for the winter and summer condition of that year. The figures for the coldest and warmest months are 4.54 and 3.54 kw.-hr. per car-mile respectively. This gives as the difference in energy consumption for the two months 1 kw.-hr. per car-mile. If we take the average figure for heater input as 6.6 kw. and the schedule speed 9.3 miles per hour, and if we consider that only 30 per cent of the cars have electric heaters, the average energy consumption for the heaters is found to be 0.2 kw.-hr. per car-mile. Subtracting this from the 1 kw.-hr. per car-mile gives 0.8 kw.-hr. per car-mile for the increase in energy due to the increased train resistance. With the monthly car mileage of the system averaging, in round figures, 4,500,000, the average car-miles per hour are 6250 and the average increase in the power demand during the winter month over that of the summer month is 5000 kw.

In this analysis the increased energy consumption of the car lights in winter over that in summer has been neglected. A little consideration of the subject, however, shows that this increase, when expressed on a car-mileage basis, is so small as not to affect the results seriously. The increased train resistance in main part is probably due to two things, increased bearing friction and the effect of snow, ice, etc., on the rail. The influence of the latter effect, while very important at times, hardly seems to be the dominating factor, since even in the summer time the energy consumption is sensitive to temperature changes. At any rate, the increased power demand is rather startling. What does it tell us? If nothing more, it emphasizes that possibilities still unutilized lie in the fields of scientific lubrication and "frictionless" bearings.

Chicago Riders Are Now Paying Higher Fares

WITH a 6-cent fare in effect on the elevated roads and a petition pending for a 7-cent fare for the surface lines, the people of Chicago have suddenly been brought face to face with the consequences of their recent vote rejecting the proposed traction ordinance. They are not so sure now that the politicians and fanatics who persuaded them to vote against the measure were talking in the interest of the car patrons. The newspapers are pointing out that while fares might have been raised under the proposed franchise, the passenger would have received immensely better service for his money.

It appears that the average Chicagoan was not aware that in more than 300 cities street car rides now cost more than they did. It was a rude shock to him when, two weeks after election day, the announcement was made that the Public Utilities Commission of Illinois had authorized a 6-cent fare for the elevated roads and that further investigation might lead to a higher rate. It was still more distressing when the surface lines management filed its petition for a 7-cent fare. The politicians got busy with excuses and plans of reprisal. There was talk of injunction and mandamus and forfeiture of franchise. Meanwhile the patrons of the elevated lines were digging down into their jeans for that extra penny.

As we pointed out in a recent editorial, the people of Chicago have had their choice. They allowed the politicians to hoodwink them, and they have passed up an assurance of substantial benefits which would accrue through unified operation and the construction of rapid transit lines. If the ordinance were now in effect there would be a good prospect of lowering the fare through the economies of single management. The people would have gained control over all the traction lines. They would have had a voice in the regulation of fares and service. Now this is left to the members of the State commission.

Chicago is the largest city which has thus far been given relief in the way of a fare advance. True, the increase was not as much as the elevated management asked for, and if there is much diversion of traffic to the competitive system the extra fare will undoubtedly fall short of its purpose. There is encouragement, however, in the announcement that the State commission will make such further change in rates as circumstances may warrant. There is significance also in the statement that war conditions constituted the reason for the order for increased fare. These conditions apply to the surface lines in Chicago to at least the same degree, because both companies were hard hit by the wage awards of the War Labor Board. It is probably only a matter of weeks, therefore, until the commission will rule that a uniform rate shall be put in force throughout the city.

Another feature of the award which is causing comment is the fact that the Illinois commission does not feel itself bound by the fact that a 5-cent fare had previously been fixed by franchise agreement between the companies and the city. Interesting developments may arise from the Chicago situation. The people recently voted against paving the way for home rule. It remains to be seen whether the payment of a higher fare will cause them to change their minds if another opportunity is given for service at cost under a board of public trustees.

A Case Where Arithmetic Won't Solve the Problem

THE human element, after all, is a strange factor to reckon with. This is the conclusion one must reach after studying the exhibits filed in a recent rate hearing in support of the company's contention that a considerable loss in traffic must result from the establishment of a higher rate of fare. Another conclusion that is apt to develop is that experience alone will show the effect on riding of such an increase.

The futility of such estimates is clearly illustrated in the comparison of returns from two cities of practically the same population and served by the same electric railway management. The company in both these localities was permitted to charge 6 cents per ride, the previous rate in City A having been six tickets for a quarter and in City B seven tickets for a quarter. It was estimated in view of these different conditions that City A would have a theoretical increase in revenue of 30 per cent and City B about 35 per cent. As a matter of fact the revenue for the first two months showed an average increase of 25 per cent in City A and only 8 per cent in City B.

The reason was easily discovered. The town which made the poorer showing was one which had for some time sold reduced-rate tickets for workmen during certain hours. These were valid during the noon-day peak and the workmen were in the habit of going home for their lunches. Immediately the uniform rate was fixed at 6 cents per ride, this mid-day travel began to fall off, with the result that the company gained only about one-fourth of the amount which would have been added to its revenues if the same number of persons continued to ride at the new rate. In the other city there was only a slight reduction in traffic, showing that the people did not like the walking habit so much as to adopt it generally because of a slight increase in the carfare.

Looking over returns of this sort from various companies one is surprised to find such a wide variety of results. A company which has in sight a possible gain of 40 per cent in revenue from a 7-cent fare gets anywhere from 8 to 25 per cent. Other properties with a theoretical increase of 20 per cent from a 6-cent fare are benefited to the extent of 5 to 16 per cent.

Reports of this kind still have a value, however, as exhibits in rate cases. They show to what extent a fare may be raised without affecting the traffic too seriously. It must be taken for granted that any increase in the fare—be it only the fraction of a cent—will cause some patrons to cut out unnecessary riding. The rate finally determined upon should be a figure which is most likely to give a net return sufficient for the company to carry on its business. It would be a mistake for the utility to ask, or for the public authorities to allow a rate so high that business will be driven away forever. The people must not be forced into the walking habit, nor should encouragement be given to the jitneys for a revival of their competition.

Varied Program At C. E. R. A. Fall Meeting

Urgency of Need for Preparing to Handle More Freight and Express Business Emphasized in Discussion at Indianapolis, Nov. 21 and 22

AS LAST week's issue of the ELECTRIC RAILWAY JOURNAL went to press 125 representatives of electric railways in the Middle West were meeting in Indianapolis, Ind., for the consideration of problems relating to the critical situation in which these railways find themselves. A telegraphic report of the Thursday session was given in the issue for Nov. 23. An abstract of the paper by A. Swartz, Toledo & Western Railroad, on "The Proper Basis for Interurban Fares" was also printed in that issue.

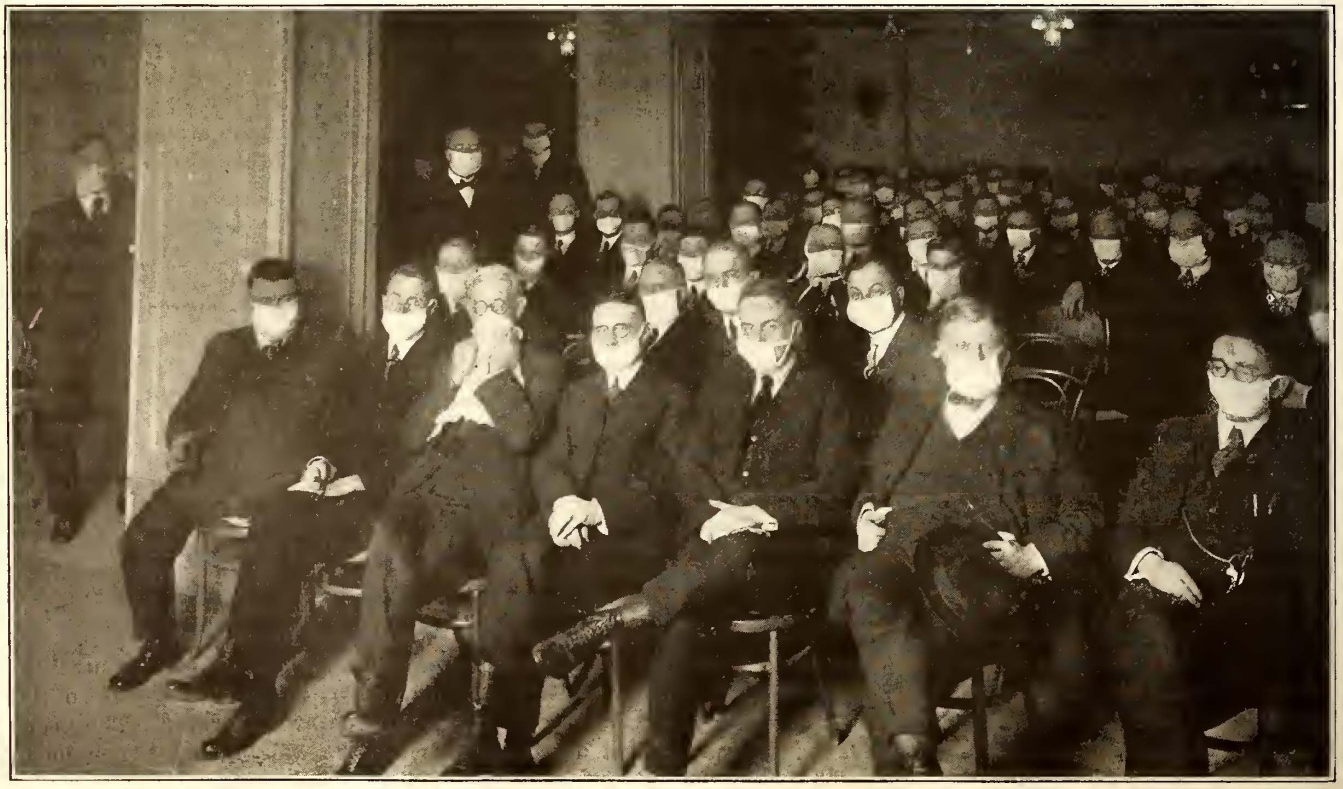
THE "GRIM REAPER" MAKES A HIT

As was mentioned briefly last week, a striking feature of the program on Thursday morning was an allegory of safety illustrated by the "grim reaper" and the "liberator." The appearance of these performers is shown in an accompanying illustration. The allegory was repeated in the evening before a large public audience in the local Keith Theater, when the railway men and guests were entertained by James H. Drew. The allegory was presented not only to impress on the men present the need for the preservation of humanity, serving thus as an introduction to R. N. Hemming's address on this subject, but to suggest the need for striking and original methods in safety campaigns.

THE LIBERATOR AND THE GRIM REAPER IN THE SAFETY ALLEGORY ARRANGED BY R. N. HEMMING

Mr. Hemming appears as the reaper, Miss Margaret Fry, of Fort Wayne, as the liberator.

In the allegory the "grim reaper," and grave-digger, appears at first alone and gloats over the rich harvest he is gathering. A bell tolled in the distance indicates some of his victims. "Taps" sounded on the trumpet also suggest to him the fact that the casualties of an accidental nature are more numerous than those of war. He goes on in this strain after the "liberator" arrives, but she finally vanquishes him when the world has been pledged to universal safety. The grim reaper then retires and the liberator tells at length what she, as universal safety, is doing for the world. The audience repeats a petition after the liberator in which life and strength to preserve mankind are prayed for.



MEMBERS OF C. E. R. A. IN SESSION AT INDIANAPOLIS FALL MEETING, NOV. 21

Following the allegory Mr. Hemming gave a striking address on the ways in which the safety movement can best be furthered, as explained in last week's issue. The audience joined him in singing a song written by William Burgess, entitled "Safety Always," and sung to the tune of "Tramp, Tramp, Tramp."

Two Papers Read at Friday's Session

W. S. Rodger, Detroit United Railway, presided at the session on Friday morning. He announced that Charles L. Henry, Indianapolis & Cincinnati Traction Company, had been appointed chairman of the committee on readjustment problems, authorized at Thursday's session. The other members of the committee are A. C. Blinn, Northern Ohio Traction & Light Company, and Mr. Rodger. C. J. Laney, Union Traction Company of Indiana, then read the paper on "Interurban Freight and Motor-Truck Competition," which is abstracted elsewhere in this issue. The discussion on Mr. Laney's paper can be summarized by the statement that the motor truck is a serious competitor of the interurban. If, however, the latter will prepare itself to handle freight and express matter, and will go after the business, this business can be obtained at profitable rates. The discussion was opened by F. D. Norviel, Union Traction Company of Indiana, who introduced as exhibits a collection of newspaper clippings showing how the motor-truck owners are going after business. He also directed attention to a booklet issued by the National Automobile Chamber of Commerce, New York City, giving full information along this line. The topics covered in the booklet are: Services to be rendered, charges, sample cost sheet, survey of route, canvass of prospective customers, operating plans, advertising and general suggestions.

EXECUTIVE COMMITTEE C. E. R. A. IN SESSION AT INDIANAPOLIS NOV. 21

Mr. Norviel quoted from a well-known farm paper to show that the farmers realize the destructive effects of heavy trucking on fine roads. In Indiana the trucking business has not as yet been highly developed. The charges appear to be about 40 cents per mile for 1 ton, 60 cents for 2 tons and 70 cents for 3 tons, an average of about 50 cents per ton-mile. This corresponds to a rate of 9 cents on the interurbans. The speaker insisted that no other means of transportation in territory served by interurbans can approach them in efficiency and speed, hence duplication is a positive waste. The interurbans should make a strong effort to secure the business that rightfully belongs to them, carrying the fight "into the enemy's country" if necessary. The electric line buys its right-of-way, and pays for the construction and maintenance of the property and a just share of the taxes, while the taxpayers pay for the good roads used by the truck operators, who pay practically nothing toward their construction and maintenance.

Other contributors to the discussion on Mr. Laney's paper were Charles L. Henry; G. H. Kelsay and L. A Mitchell, both of the Union Traction Company of Indiana; A. B. Cole, Westinghouse Electric & Manufacturing Company; G. K. Jeffries, Terre Haute, Indianapolis & Eastern Traction Company; C. N. Wilcoxon, Chicago, Lake Shore & South Bend Railway. Mr. Henry advocated attention by the executive committee to the matter under discussion and pointed out that the abnormal conditions due to the war have favored the motor truck. The convenience of pick-up and delivery service and the lack of freight cars on steam roads have been factors. All that the electric lines want is their legitimate share of this business. Mr. Kelsay's point was that the farmers should be reached through their own mediums in an effort to show them the true economic condition involved in the competition under discussion. Mr. Mitchell suggested that the association should collate information on the cost of maintaining concrete and other roads in order that data may be available for use in publicity campaigns. Mr. Cole mentioned cases of excessive damage to roads by motor trucks and showed how inefficient their operation is in comparison with electric lines. As a typical illustration of what a railway can do, Mr. Jeffries explained how his company had built up a good business in handling live stock, for which the electric railway is well fitted. Mr. Wilcoxon put the whole matter "in a nutshell," in stating that electric railways must first get ready for the freight business and then, he feels sure, they can make money in handling it. He demonstrated this from the experience of his own company.

What's Coming After the War?

The second paper at the Friday session was read by the author, Harry Reid, Interstate Public Service Company. It is abstracted elsewhere. It was discussed principally by Arthur W. Brady, Union Traction Company of Indiana. He said that the point to impress upon all concerned with the welfare of electric railways is that, as shown by past experience in after-war periods the high level of prices will not immediately recede. The prevalence of an erroneous idea that immediately upon the conclusion of peace prices will be materially reduced, would be extremely unfortunate. Such emergency and temporary relief as has been granted must, therefore, be continued for some time.

Other Items of Interest

After adjournment of the meeting the executive committee held a second session and decided to appoint a committee on motor-truck competition. The personnel of the committee was not decided upon.

The executive committee announced that the annual meeting will be held at Detroit, Mich., on Feb. 27 and 28, 1919. A nominating committee, consisting of F. D. Carpenter, Western Ohio Railway; Charles L. Henry, Indianapolis & Cincinnati Traction Company; S. D. Hutchins, Westinghouse Traction Brake Company; W. H. Bloss, Ohio Brass Company, and W. S. Rodger, Detroit United Railway, was appointed.

The whole meeting was unique in that, due to the prevalence of Spanish influenza in Indianapolis, the attendants were required to wear gauze masks. The ELECTRIC RAILWAY JOURNAL therefore arranged to have both the executive committee and the Thursday gathering photographed with the result shown in the illustrations.

Interurbans Have Not Done Duty*

They Slumbered While Motor Trucks Went After the Freight—Real Salesmanship by Interurbans and Railway Reconstruction Are Among Essentials Now Needed

BY CHARLES J. LANEY
Traffic Manager Northern Ohio Traction & Light Company, Akron, Ohio

BECAUSE interurban railways have failed to do their duty to themselves and the public, a business of vast magnitude has slipped away from them. Every interurban line is to-day suffering a great loss in revenue because the possibilities of freight traffic have been overlooked. Every community through which an interurban line operates has been put to loss and inconvenience because an obvious public duty has not been performed.

Under the circumstances it is not surprising that the motor truck has entered the field, taken over the bulk of local freight business on the interurban lines and is now so intrenched that it will be difficult to dislodge it.

In a large sense the motor truck is not a competitor of the interurban. It is the other way round. We are turning our thoughts toward competing with the motor truck, which slipped in and captured the business while we slumbered.

WHY MOTOR TRUCK SERVICE WAS ESTABLISHED

Properly to diagnose the situation, we must first consider the causes. There are three good reasons for the establishment of motor-truck transporation.

1. *Failure of Interurban Lines to Establish Freight Service*

We taught the public the value of service, but we forgot to develop that service to the extent of public needs.

Motor-truck transportation had its start in territory served by interurban lines. These lines were built at a great cost. Rates were made very low and frequent service was established. Real estate developments in the suburbs were encouraged. Excursions were run at frequent intervals, and inter-community intercourse was encouraged in every possible way.

All this was done with the single idea of inducing people to ride. There was no thought of freight. We completely overlooked the fact that the farmer whom we induced to ride to the town would some day want to ship his produce and livestock to the same town; that he would welcome the service which would bring his clothing and groceries, his furniture and machinery to his farm. We were willing to sell him a ride, but we had no thought of carrying to him the things he needed in his daily life. The motor truck rolled in and solved his problem, because we had failed to do so. This service is expensive. It is inadequate. It can never be wholly satisfactory. But until the interurbans wake up, it will be accepted.

2. *Aggressive Sales Methods of Motor-Truck Manufacturers*

A traffic survey of motor trucks operating between two commercial centers of one of our states reveals the fact that motor trucks are being sold to individuals and companies on the installment plan, and the sales department of the manufacturer is guaranteeing the purchaser a certain amount of business with a particular truck. Automobile clubs and chambers of commerce have been influenced by the same source in an attempt to encourage local business men to divert their freight to certain truck owners.

Advertising, "Save a Freight Car for Uncle Sam," is appearing on all inter-city truck lines. This publicity makes it appear that it is a patriotic duty to use trucks as a means of transportation—the loss of man power to the government, when the interurbans are able to meet the condition, not being taken into consideration.

3. *Public Is Antagonistic to Utilities*

The campaign of hatred against public utilities which was inaugurated about twenty years ago has been a direct aid to motor-truck development. The justice or injustice of this attitude on the part of a great many people is immaterial. The fact that it exists is all that concerns us. The influence is great in encouraging truck transportation.

WHAT IS BEING ACCOMPLISHED BY MOTOR TRUCKS

A recent traffic check of the motor-truck business between two large commercial centers in one of our states shows that 340 tons of freight are being transported daily (including Sundays) by motor trucks. The trucks operated were of 1, 2, 3, 4 and 5-ton capacity. The average number of loaded trucks daily in one direction was forty and in the other direction forty-four, or eighty-four loaded trucks in both directions. The average load per truck was 4 tons. The average number of empty trucks operating (or those that did not have a return load) was nineteen in one direction and eleven in the other direction. Loaded trucks operating in both directions during the seven-day check numbered 592; empties, 213—or the empties were 26 per cent of the total in operation.

The schedule of rates which the truck companies attempt to maintain for the 35-mile haul is as follows: Under 1000-lb. shipment, 40 cents per hundredweight; from 1000 to 3000 lb., 35 cents per hundredweight, and over 3000 lb., 30 cents per hundredweight.

The service does not include pickup and delivery feature in both cities. Some of the companies maintain a central warehouse and only deliver to the consignee, and they pick up from the consignor when a full load obtains. The truck companies have no classifica-

*Abstract of paper presented at fall meeting Central Electric Railway Association, Indianapolis, Ind., on Nov. 21-22, 1918.

tion of commodities; nor are loss and damage claims collectible in most cases.

Motor-truck and motor-bus manufacturers have so efficiently spread the propaganda of carrying freight and passengers by motor methods that the public has been believing that it was a war measure to use their means of transportation. The fact is that it is an after-the-war consideration. When peace is finally adjusted there will be a vast number of unused and second-hand army trucks on the market, and the promotion of a gigantic truck transportation organization will be a factor in securing these trucks to flood the country with transportation means that will hinder the development of our resources. I have been advised that there is now a movement on foot to make motor-truck and motor-bus transportation a factor after the war, and auto manufacturers and rubber-tire industries are promoting an organization with that end in view.

Interurban lines, to a great extent, are at a standstill in making their freight service more attractive to the shippers. In the first place, they think that business in these abnormal times will come to them without solicitation, that they are getting the business that is due them and that any interruptions in the service can be blamed on war conditions. In the second place, they are increasing their passenger fares and cutting down their excellent service in order to increase their revenue and reduce their expenses—and the public is antagonistic. In the third place, trucks will not last long on account of the absence of return loads and the heavy expense the trucks are experiencing. The interurbans, when they first started to operate, did not know the cost per car-mile—so why blame the other fellow? When a truck operator ceases to exist other operators are ready to step in. The failure to meet these conditions is supporting the propaganda for motor-truck competition.

The Question of Road Destruction

Road destruction is the result of truck operation. The streets and country roads are being used without any cost whatever to the truck operators. There is not a road built that will stand the constant 5 and 6-ton truck traffic. The cost to the public to keep these roads in repair is enormous. The interurbans, where they parallel the country roads, are twice losers. As abutting property owners they are compelled to pay their proportion of the repairs and upkeep and, at the same time, are deprived of the business.

It is true that the farmer is probably at more expense for the upkeep of these roads than interurban lines, but truck propaganda concerning the advantages of a quick market for his produce is diverting the farmer's attention from present expenses to future possibilities.

Another factor is the attitude of the steam roads. The bitterness that existed against us when the steam roads were privately owned did not cease when the government took them over, and now it has developed into political propaganda.

During the past year we have been led to believe that interurban lines were a war necessity, and that on account of the congestion of the steam lines we could be of great aid transporting drafted men to the different cantonments and l.c.l. freight between commercial centers. We spent time and money preparing data without so much as "Thank you" for the efforts.

In a letter of Oct. 15 from Regional Director of Railroads A. H. Smith to the Federal Managers of Railroads of the Eastern region, he said:

> The railroads in this region have generally in effect tariffs on per ton per car basis for movement of freight from a point of origin to a destination within switching limits of the same city or between contiguous cities, which should be drayed. The enormous growth of traffic, particularly incident to war conditions, makes it imperatively necessary that railroad yards and motive power be relieved of this traffic. To accomplish this at once, please issue embargoes thereon . . . our idea being to eliminate this work as far as possible and, if necessary, have the business drayed under the direction of the Highways Transport Committee, Council of National Defense.

Here we see the effect of the propaganda which the motor-truck people have been feeding the public. Even these men who from training and experience should know the greater efficiency of electric transportation overlook it entirely.

Motor Trucks Should Be Regulated

A serious condition of motor-truck operation is that they are not recognized as a common carrier and are not under regulation. Too much leeway has been given this means of transportation. There are no laws governing them, so they are not disregarding any laws of commerce in rate discrimination. Truck companies contract for the transportation of factory products from one city to another and accept freight for a return load at "any old price." Interurban rates are governed by state authorities and, of course, do not get the business. The rate discrimination, the loss of fuel, the loss of man power to the government and the destruction of roads all require that motor-truck operation be controlled.

Moreover, road building on a large scale will be resumed early next spring and will arouse more active interest in truck transportation. The motor-truck manufacturers and sales managers will make the best possible use of this opportunity to spread their propaganda. It is our duty to ourselves and the public to see that the value of interurbans as freight carriers is made clear to the public at the same time. This will call for energetic organized effort.

Suggestions for the Wise

As a remedy for present ills I suggest to interurban lines the following:

Recognize your traffic department as one of the most important factors of your organization. It is your sales department. Organize that department so that your product, "service," can be made efficiently attractive to the public. Analyze the motor-truck operation in your territory, and apply a consistent remedy.

Influence your local authorities to have laws passed regulating the tonnage that trucks should be permitted to carry over the highways.

Motor trucks, where they operate for revenue, should be made common carriers and placed under the jurisdiction of the state commission.

For the maintenance of the highways over which the motor truck operates, a rental of a specified sum per ton-mile should be assessed.

Punch up your public relations department and have it snuggle up closer to the public. Tell the public the truth.

This is a period of reconstruction. Get busy!

The Interurban After the War*

Increase in Freight and Passenger Revenues and Careful Scrutiny of Operating Expenses Are the Only Means of Salvation

BY HARRY REID
President Interstate Public Service Company, Louisville, Ky.

THE future, as we all know, is a mystery, and predictions are largely based upon what has transpired in the past. In our business we have no precedent to follow, as the first interurban was put into operation in 1885 and this business is, therefore, a comparatively modern development. History tells us, however, that after the Napoleonic wars twelve or fourteen years passed before prices returned to normal and following our own Civil War a period of five years elapsed.

To my mind there are three factors which have saved the interurban from going on the financial rocks during the last eighteen months: First, the increased rates which have been granted us by commissions and regulatory bodies; second, the postponement of maintenance work which could be deferred with safety, and third, the increased travel which many roads have enjoyed due to war activities. Even though commodity prices may gradually recede, nevertheless, for several years to come we shall need these increased rates to maintain our business in a healthy condition and they should be continued until we may have an opportunity to bring it back to a normal basis. From observation I have gained the impression that, in the past, operators of interurbans have given too much thought to steam road competition, rather than to a development of business along the lines for which it was originally intended, namely, in serving localities which for one reason or another could not be served by steam roads.

If my assumption is correct that it will take some years for prices to return to normal, then in order that we may do the proper amount of maintenance work and keep our properties out of receivership we must be allowed to continue with at least the rates we are now receiving for our service. In addition we must carefully study our possibilities so as to bring about increased revenues. The main source of our revenues is in passenger business and, so far as I have been able to observe, no special effort is being put forth to build up earnings in this quarter. Is it not a fact that we have had the feeling that the public would only ride with us if the service was cheap? I do not agree with this theory. The public will ride with us if we furnish suitable accommodations in the way of comfortable, well-ventilated cars and transport them at speeds essentially the same as those at which they can make similar trips on the steam roads. I do not, however, advocate rates as high as steam road rates for passenger business, for I realize there are a great many people to whom a lower rate is a consideration.

Let us turn to the other phase of our business, the freight service. Many roads were averse to handling freight until they were forced to do so by the commissions. This is another field in which the interurban operators felt it necessary to have low rates to secure business. The operating expenses of an interurban road for its freight business are higher than on steam roads, therefore, we should have rates equal to steam road rates, placing dependance upon our superior service to get the business. There is no question that for merchandise carrying, at the first, second and third class rates on short hauls, say up to 150 miles, our service cannot be equaled by the steam roads. Our service is more of the nature of express than freight service, and we should receive remuneration accordingly. We have all heard it said that freight with the interurban cannot be made to pay. My own experience teaches otherwise. The development of the freight business on our property has not been entirely accomplished through increased rates. With practically no solicitation we were getting more freight than we could handle, so that it became necessary at times to put on embargoes. We found that some additional equipment was needed and this was purchased last spring. As a result our hopes have been realized in the turning of our freight business from a liability to a small asset. In addition, we have developed a milk service, and have made an express contract with the Wells-Fargo Express Company. We bring a carload of milk into Indianapolis each day and the express matter is carried on our regular trains at small expense.

It is an economic fact that when money is plentiful, commodity prices are very likely to be high and money to be cheap, and vice versa. In the past two years high commodity prices have prevailed, due not only to the plentiful supply of money but also to the law of supply and demand, and to the fact that our own government and our Allies were the principal purchasers of both materials and money. War conditions have upset all calculations which the business world may have made and the government will be a large bidder for money for several years, or until the billions of debts it has assumed have been paid. During this same period reconstruction will necessarily take place, with demands for both materials and money. We must look forward, therefore, to a continuance of abnormal prices of materials and money for a period of from five to ten years. For these reasons we must be allowed to maintain rates which will give us adequate returns on the capital invested in our properties and thereby attract capital to our enterprise and assist the persons responsible for raising the necessary funds with which to purchase the equipment for the betterment of our service.

There is another duty devolving on us, namely a more careful scrutiny of our expenses. The production engineer must seek to produce greater economies in the power plant; the master mechanic must not only see that his equipment is in safe operating condition but must know that there is no waste; the superintendent of transportation must study his train schedules and train sheets to see that there are no trains operating at a loss; the track maintenance and overhead departments must look carefully into their costs, and the traffic and claim departments must not lose sight of the fact that a great deal depends on them for the success or failure of the enterprise.

Another very important and valuable asset to the interurban of the future will be a department of public relations properly managed and maintained. Very little, if any, attention has been given in the past by interurban management to this important subject. Each interurban organization should have these duties dele-

*Abstract of paper presented at fall meeting of Central Electric Railway Association, Indianapolis, Ind., on Nov. 21, 22, 1918.

gated to some of its officials. The war has, I think, more than anything else, brought to the minds of the public and our patrons the troubles which we have had to encounter, and I feel sure that by keeping the public fully advised of our different problems great good can be accomplished in the way of maintaining proper relations.

In conclusion I would say that interurbans after the war will only survive and be able to give the maximum of service by being allowed to continue with at least the present rates, and in addition we must do our part by increasing both freight and passenger revenues to the very limit and by exercising a more careful scrutiny of our operating expenses so that not one penny is wasted.

New Orleans Adopts Modern Transportation Organization

Duties of Department Heads Clearly Defined—Inter-relation of Departments Will Result in Greater Efficiency of Each

WHEN Nelson H. Brown, formerly superintendent International Railway, Buffalo, N. Y., became manager of the New Orleans Railway & Light Company a few months ago, he worked out an up-to-date plan of organization. The details of this follow:

Superintendent of Transportation: He will report to the manager and will be responsible for (1) Preparation and maintenance of schedules adequate for traffic; (2) operation of cars and trains to conform to schedules; (3) proper distribution of equipment; (4) enforcement of transportation rules and regulations, and (5) employment, instruction, discipline and records of trainmen and others in the transportation department.

He will have general supervision over all matters in the transportation department, devoting himself to such larger issues as may develop, particularly as to the adequacy and the character of the service performed. He should keep fully informed in advance as to events likely to attract crowds in excess of normal provisions for service, and direct such additional service as may be needed. He should confer freely with his immediate subordinates and devote the major part of his time on the lines, and he should suggest and install improvements in car and train service, discipline, etc.

Superintendent of Schedules: He will report to the superintendent of transportation and will be responsible for preparing schedules adequate to meet traffic requirements. Traffic checkers and others in the schedule department will report to the superintendent of schedules.

Superintendent of Inspection: He will report to the manager and will be held responsible for checking conductors for registration and collection of fares and for violations of rules. These reports, together with the conductor's record, will be forwarded promptly to the office of the manager, who after inspection will forward them to the superintendent of transportation. The latter will be held responsible for the enforcement of the rules and regulations and for the application of discipline.

Superintendent of Employment: He will report to the superintendent of transportation and will be held responsible for employing and instructing conductors and motormen.

Division Superintendents: They will report to the superintendent of transportation and will be held responsible for operating stations and lines to which they are assigned. They will see that all rules and regulations are obeyed, and that proper service is furnished. They will take up directly with the superintendent of schedules all matters pertaining to schedules and keep closely in touch with the schedule department. Before the addition of extra service, the approval of the superintendent of schedules will be necessary, except in cases of emergency.

Station Foremen: They will report to the division superintendent and will be held responsible for the station to which they are assigned. They will be required to see that proper discipline is maintained and that crews are in proper condition for duty. They will see that all cars leave the station promptly, and that station clerks perform their duties properly.

Supervisors (inspectors): They will report to the division superintendents. They will be held responsible for the operation of the line or lines to which they are assigned and will be required to see that the rules and regulations are enforced, and that cars are operated safely and as near schedule as possible. They will see that the schedule is adequate for requirements and will make their recommendations to the division superintendent.

Claim Agent: He will report to the manager and will be held responsible for investigating and adjusting claims. He will confer freely with the manager in regard to claims involving large expenditures.

Superintendent of Track: He will report to the manager and will be held responsible for maintaining track, roadway, paving, bridges and buildings.

Roadmaster: He will report to the superintendent of track and will be held responsible for constructing and maintaining track. All employees in the track department will report to and receive their instructions from the roadmaster.

Superintendent of Equipment: He will report to the manager and will be held responsible for maintaining cars, equipment, shops, etc.

Master Mechanics: They will report to the superintendent of equipment and will be held responsible for the shop to which they are assigned. They will see that all employees comply with the rules and regulations.

When this organization was put into effect, Mr. Brown reminded the men that they were all employees of the same company, working to the same end. Should they discover in another department defects requiring immediate attention and are in a position to apply the remedy, they are expected to do so, reporting to the proper head in due course.

Fuel Economy on the Railroads

THAT the campaign among the railroads of the United States for conservation of fuel may result in an annual saving of 10,000,000 tons of coal and 840,000 gal. of oil was a statement contained in a paper prepared for the Western Sections meeting of the American Society of Mechanical Engineers, at Indianapolis, Nov. 15, by Major Edward C. Schmidt, assisting manager of the Fuel Conservation Section of the United States Railroad Administration.

"Present estimates indicate that during the calendar year 1918, United States railroads will use about 175,000,000 tons of coal for all purposes, including both bituminous coal and anthracite," declared Major Schmidt. "Of this amount about 157,000,000 tons will be consumed in locomotive service and about 18,000,000 tons at stationary power plants and for miscellaneous purposes. In addition, the railroads will use approximately 42,000,000 gal. of fuel oil.

"Basing our calculations on these totals, we estimate that the savings likely to result from our campaign during the period for which it has been under way, will be at the following annual rates:

"Two per cent saving due to improvement in quality of coal, or 2 per cent of 175,000,000 tons, which amounts to 3,500,000 tons; 3 per cent saving on the coal used in locomotive service, or 3 per cent of 157,000,000 tons, which amounts to 4,710,000 tons; and 10 per cent of 18,000,000 tons of coal used at stationary power and heating plants and for miscellaneous use, 1,800 000 tons; making a total of 10,010,000 tons. In addition, it is estimated 2 per cent of the 42,000,000 gal. of fuel oil, or 840,000 gal. will be saved."

Energy Consumption of Cars Is Affected by Temperature Changes

That the Power Required for Car Operation Is Affected by Variations in Schedule Speed, Number of Passengers Carried and Temperature Is Shown by an Extended Study Made by the Public Service Railway

BY M. B. ROSEVEAR
Superintendent of Distribution, Public Service Railway, Newark, N. J.

IN THIS ARTICLE an attempt is made to set forth the results of a study made on the relation between the energy consumption of cars and the temperature variation, as existing on the lines of the Public Service Railway. A general summary of the data used in connection with this study is graphically displayed in Fig. 1. On this chart the following data are plotted for the period of five years and three months: Total kilowatt-hours per month, as measured at the direct-current buses in the substation; total car-miles operated per month; average monthly kilowatt-hours per car-mile; annual average kilowatt-hours per car-mile; mean temperature of each month and of each year.

The energy figures include the line losses as well as the actual input to the trolley as measured at the car itself. The temperatures used are the official figures as given by the United States Weather Bureau for Newark. This point was chosen as a temperature base because the bulk of the power is used in Newark and vicinity and Newark is, therefore, approximately the "center of gravity" of the power distributing system. While other towns served by the company might have temperature variations slightly different from those at Newark, these variations could affect the final results but very little. The graphs of total car-miles and total kilowatt-hours used, while showing cyclic variations with the seasons, do not permit of ready analysis and are of interest chiefly as showing the magnitude of the operations studied.

Analysis of Power Curve

The next step in the study was to calculate the monthly average kilowatt-hours per car-mile and to plot these averages against time as a base line. The resulting graph is interesting. At first glance it would seem that a greater amount of energy was required to perform the same work during the winter of 1915-1916 than during the corresponding periods of 1914-1915 or 1913-1914. Similarly, it would appear that operation was even less efficient during the winter of 1916-1917.

A careful study of the graph and some auxiliary operating data, however, developed several important facts.

It will be noted that wherever there is a peak in the temperature curve there is a "valley" in the kilowatt-hours-per-car-mile curve. In fact, if one follows the breaks in the graphs it will be seen that but for two or three exceptions a break in temperature is followed by a corresponding one in energy consumption. This fact leads at once to the conclusion that the relation between temperature and energy consumption is a very definite one. In order better to illustrate this relation, data relating to mean temperature and average kilowatt-hours per car-mile for the year 1917 were taken from Fig. 1 and replotted in Fig. 2. The resulting points were averaged by the graph shown. It will be noticed that while the line is not a perfectly straight one the diversions of the points from the smooth line drawn are in no case very great. In general this graph shows that an increase in temperature is accompanied by a decrease in energy consumption. And this is equally true of high and low temperatures.

It will be observed, Fig. 1, that the annual average kilowatt-hours per car-mile are closely related to the annual mean temperature. For the warmer years the energy consumption on a car-mile basis is lower than during the cold ones. This relation is better shown in Fig. 3 in which for clearness the temperature graph has been inverted. It will be noted that for the last five years the mean temperature has been slowly decreasing. This would explain in part the apparent increase in energy consumption during this period.

The second factor that has tended to increase the kilowatt-hours per car-mile has been the purchase of new and larger cars to take care of increased business and provide for the retirement of older and smaller equipments. The following list shows the increase by years:

Year	New Closed Cars	New Open Cars
1913	39	0
1914	25	0
1915	30	20
1916	70	127
1917	100	50

The kilowatt-hours per car-mile for 1916 show a greater increase over 1915 than the decrease in temperature would seem to account for. It will be noted that during 1916 there were added 127 large open cars and seventy closed cars. These larger closed cars were in service during all of 1917 whereas they were not in service during the early months of 1916, therefore accounting for a part of the still further increase in kilowatt-hours per car-mile during 1917.

Passenger Loading Affects Power Consumption

That the passenger loading is not the most important factor in power consumption is shown by the comparison of 1913 and 1914. In 1914 the kilowatt-hours per car-mile were greater than in 1913 although the passengers per car-mile were fewer. During 1916 and 1917, however, the kilowatt-hours per car-mile increased at rates corresponding quite closely with the loading. Fig. 4 has been prepared to show the relation between passengers per car-mile and kilowatt-hours per car-mile for

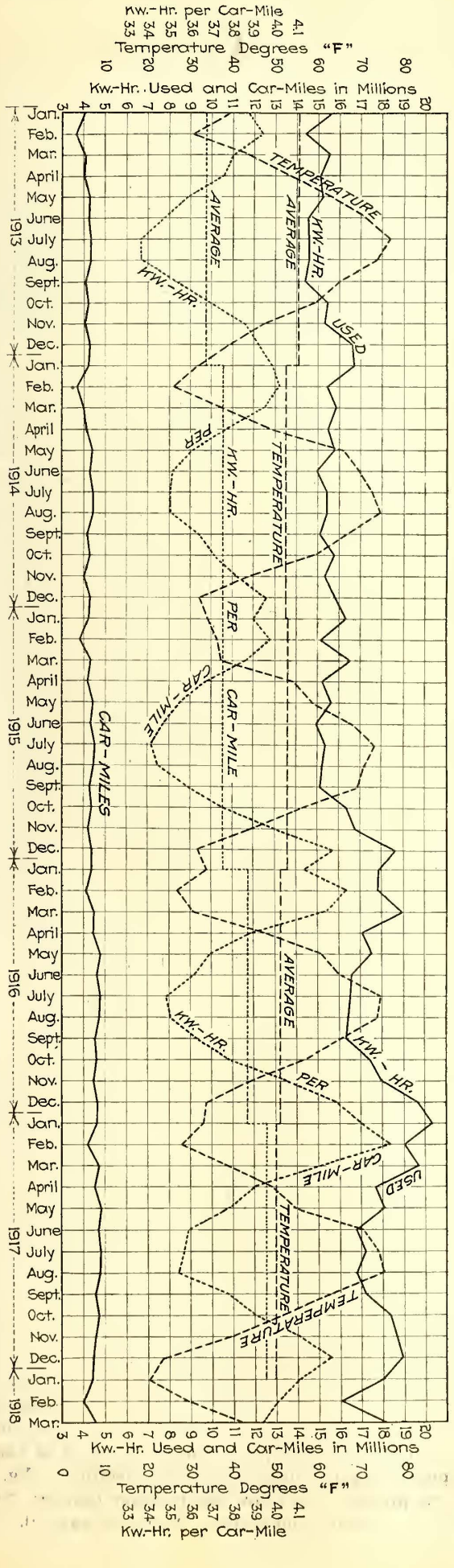


FIG. 1—GRAPHS SHOWING POWER, TEMPERATURE AND CAR-MILEAGE DATA FOR FIVE-YEAR PERIOD

TABLE I—DATA RELATIVE TO PASSENGER LOADING AND ENERGY CONSUMPTION

Year	Passengers per Car-Mile: Average	Passengers per Car-Mile: Increase Average	Passengers per Car-Mile: Increase Per Cent	Kilowatt-Hours per Car-Mile: Average	Kilowatt-Hours per Car-Mile: Increase Average	Kilowatt-Hours per Car-Mile: Increase Per Cent
1913	8.18	...	...	3.678	...	...
1914	8.11	—0.07	—0.85	3.757	0.079	2.15
1915	8.09	—0.02	—0.25	3.757	...	...
1916	8.31	+0.22	+2.7	3.867	0.110	2.93
1917	8.58	+0.27	+3.2	3.954	0.087	2.25

the period studied. As additional information relative to the number and condition of cars, Table II has been prepared.

In 1916 and 1917, when increases in passenger loading amounted to 2.7 per cent and 3.2 per cent respectively, it will be seen that the proportions of total new cars, new closed cars, and new open cars are in every instance greater than the increases in passengers per car-mile.

A fourth factor is the increased number of electric heaters in service. The yearly increases are here listed.

Year	Increase in Electrically Heated Cars
1913	39
1914	139
1915	30
1916	126
1917	10
Total	344

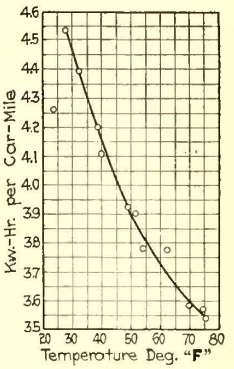


FIG. 2—RELATION BETWEEN MEAN TEMPERATURE AND ENERGY CONSUMPTION

The total number of electrically heated cars at present is 697. These heaters consume from 3.6 to 9.6 kw. per car, that is, approximately from 10 to 20 per cent of the power required to move the car over the road, and account for a portion of the increased

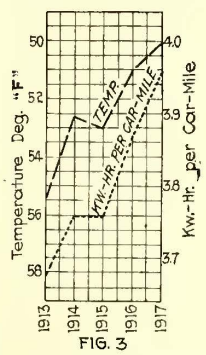


FIG. 3

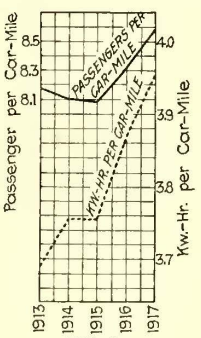


FIG. 4

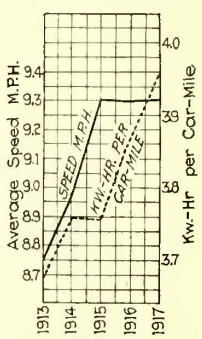


FIG. 5

FIG. 3—EFFECT OF MEAN ANNUAL TEMPERATURE ON AVERAGE KILOWATT-HOURS PER CAR-MILE. FIG. 4—INFLUENCE OF PASSENGER DENSITY ON POWER REQUIREMENTS. FIG. 5—EFFECT OF INCREASED SCHEDULE SPEEDS ON ENERGY CONSUMPTION

kilowatt-hours per car-mile each year, although obviously not all of it.

A fifth factor affecting energy consumption has been the increase in schedule speeds. The increases are graphically shown in Fig. 5. It will be noted that the increase in speed during 1914 as compared with

TABLE II—TOTAL NUMBER OF CARS AND NUMBER OF NEW CARS

Year	Closed Cars: Total Number	Closed Cars: New Number	Closed Cars: New Per Cent	Open Cars: Total Number	Open Cars: New Number	Open Cars: New Per Cent	Total Cars: Total Number	Total Cars: New Number	Total Cars: New Per Cent
1913	1665	39	2.34	490	...	.....	2155	39	1.81
1914	1651	25	1.51	433	...	.....	2084	25	1.21
1915	1654	30	1.81	435	20	4.60	2089	50	2.40
1916	1704	70	4.10	560	127	22.60	2264	197	8.70
1917	1792	100	5.58	602	50	8.30	2395	150	6.20

1913 corresponds very closely with the increase in power consumption.

In order properly to interpret the power consumption curve it is necessary, as will be seen from the foregoing, to take into consideration all of the factors mentioned herein. By so doing, we find that:

1. The increase in kilowatt-hours per car-mile for 1914 over 1913 is due to a combination of decreased temperature and increased speed, these two factors more than neutralizing the slight falling off in passengers per car-mile.

2. The equality of kilowatt-hours per car-mile for 1914 and 1915 is due to a combination of higher temperature and fewer passengers per car-mile, these offsetting the increase in speed.

3. The increase in kilowatt-hours per car-mile in 1916 over 1915 is due to a combination of lower temperature and a greater number of passengers per car-mile, the speed remaining practically constant. As brought out earlier, the increase of 0.22 passenger per car-mile, or 2.7 per cent, during the year was made possible by the addition of 197 larger cars which amounted to 8.7 per cent of the total.

4. The increase in kilowatt-hours per car-mile in 1917 over 1916 is due to a combination of lower temperature and larger number of passengers per car-mile, the speed again remaining almost constant. The increase of 0.27 passenger per car-mile, or 3.2 per cent, as also mentioned before, was due in part to the cars added during 1916 which were used during only part of 1916 whereas they were available for service during all of 1917.

Influence of Power-Saving Campaign

It will be seen by reference to Fig. 1 that the energy consumption was considerably reduced during the winter of 1917-1918, and this in spite of the extremely low temperature during December and January. This saving, it is believed, has been due to two factors:

1. During the fall of 1917 and the succeeding winter special efforts were made to have trainmen save power by careful operation, these efforts being supplemented by the publicity campaign of the United States Fuel Administration.

2. Commencing early in January, electric heaters were cut off during certain hours prescribed by the New Jersey Public Utilities Commission, in order to save fuel, as the power stations were unable to secure coal due to the unusual severity of the winter.

Accident Reduction in Columbus, Ohio

For the information and encouragement of all concerned H. W. Clapp, general superintendent Columbus Railway, Power & Light Company, has posted records of accident reduction in the form shown in the table below.

1917 ACCIDENT RECORD AS COMPARED WITH PREVIOUS YEARS

Ratios in Per Cent	1917 / 1916	1916 / 1915	1915 / 1914
1. Boarding moving cars	26.5*d*	27.6*d*	4.6*i*
2. Leaving moving cars	50.3*d*	45.9*d*	21.7*d*
3. Collisions, cars and wagons	3.5*d*	14.0*d*	20.6*d*
4. Collisions, cars and automobiles	47.0*d*	37.8*i*	3.0*i*
Automobiles in Franklin County as of Dec. 31	36.0*i*	42.0*i*	43.0*i*

i = increase
d = decrease

Electrically Operated Ditcher Effects Big Saving

This Is the First Electric Machine Built for Ditching Purposes—Operates at 1200 or 1500 Volts with 30-Hp. Motor

By Charles W. Ford
General Superintendent Kansas City, Clay County & St. Joseph Railway

THE Kansas City, Clay County & St. Joseph Railway (known as the "Missouri Short Line") operates 78 miles of line comprising two divisions, one running in a northeasterly direction from Kansas City, a distance of 28 miles, to Excelsior Springs, and the other in a northwesterly direction, a distance of 52 miles, to St. Joseph. There are heavy cuts and fills along both divisions, and a great amount of the material that it is necessary to handle out of the ditches is a grade of clay which is exceedingly difficult to dig when dry, and is about the stickiest substance extant when wet. Besides this clay there is much rock and shale in the cuts along the line and a few years ago slides were not uncommon in wet weather. Many of these slides were of considerable proportions, causing much delay to traffic, and making it apparent that ditches were a prime necessity if the lines were to be kept open in rainy weather.

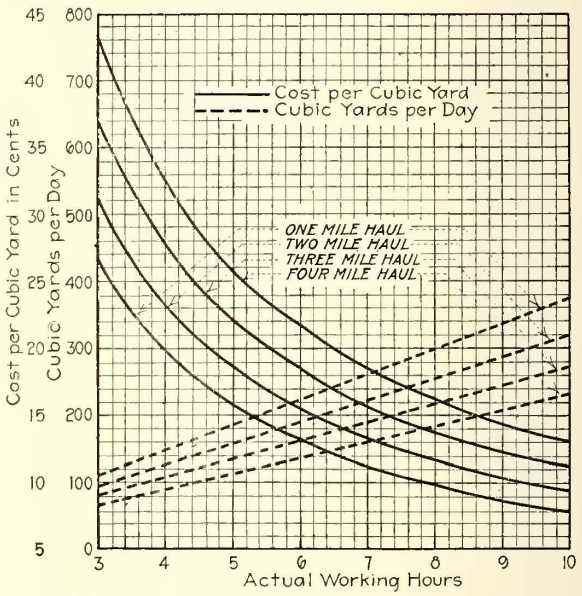


FIG. 1—COST GRAPH FOR ELECTRIC DITCHER

During the years 1913 and 1914 ditching was done by hand, a total of about 20,000 yd. annually being taken out at a cost of approximately 40 cents per cubic yard. This represented a total ditching cost of $8,000 a year, and it may be stated that it was much easier to spend the $8,000 than it was to get the 20,000 yd. of dirt out of the ditches. The diminishing supply of labor and the very apparent fact that hand labor was unable to cope with the ditching problem in a satisfactory manner led the officials of the road to investigate power ditching methods, with the result that an "American Railroad Ditcher," manufactured by the American Hoist & Derrick Company of St. Paul, Minn., was finally purchased for delivery during the first half of 1915. Careful estimates on the amount of work that could be done

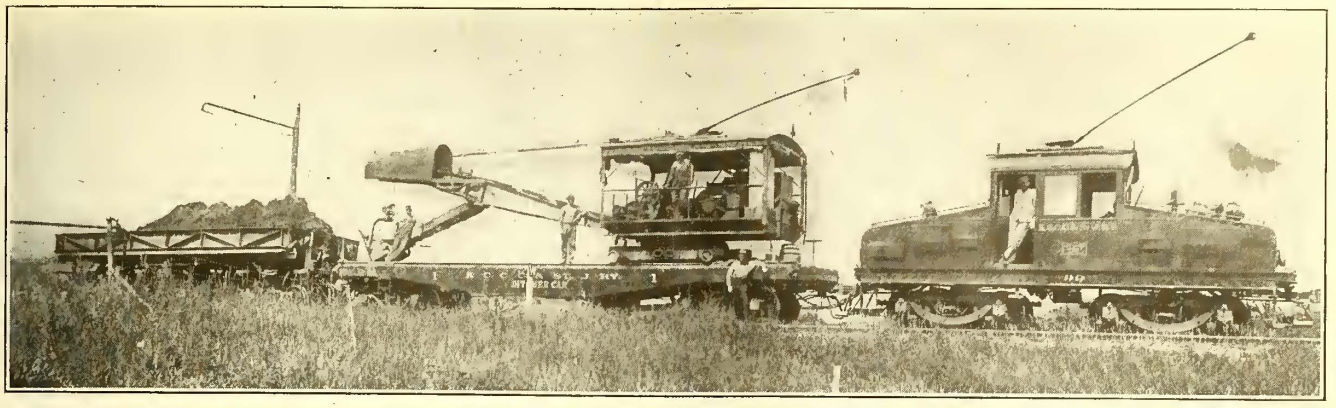


FIG. 2.—ELECTRICALLY OPERATED DITCHING OUTFIT ON THE K. C., C. C. & ST. J. RY.

by this machine were made, and the results to be obtained were calculated on the basis of curves shown in Fig. 1, the total yardage taken out daily being dependent upon two factors, *i.e.*, actual time worked and length of haul.

As the Kansas City, Clay County & St. Joseph Railway is an electric line, an electrically operated ditcher was ordered with a 30-hp. direct-current motor, to operate on 1200 or 1500 volts. This was the first electrically operated machine of this type that was ever built, and its performance has measured up to the fullest expectations of both its builders and the owners. Since the ditcher was installed it has handled, during the working season, from May to December inclusive, an average of 200 cu.yd. per day, or approximately 48,000 cu.yd. for the ditching season.

The ditcher is mounted on a specially constructed flat car 50 ft. long and with a capacity of 100,000 lb. The ditcher travels back and forth on the car on two sections of 100-lb. A. S. C. E. rails, this being necessary in order to permit the flexibility of forward or backward motion when loading the shovel or, if the material is to be hauled, when unloading into dump cars placed in front of the ditcher.

In most instances the material taken from the ditches and the cuts is deposited on the fills as shown in Fig. 3, which illustrates the operation of widening out fills, but in shallow cuts the material taken from the ditches is in many cases deposited on the surface of the sides of the cut, as indicated in Fig. 4, thus providing an embankment which takes the place of surface ditches. This operation, which is much more rapid than is the use of dump cars, eliminates the haul entirely. The dump cars are of the side-dump type, holding 20 cu.yd. and are operated by air, the entire train being hauled by an electric locomotive as shown in Fig. 2.

Now that the ditches have been cleaned out and the slides taken care of it was found necessary to use the ditcher this year for a period of only two months, and for the sixty days from May 1 to July 1, 1918, the following figures covering an average day's work have been compiled:

Work: Right-of-way ditching, cut widening, and bank filling.
Material: Clay, fairly dry and tough, with some stone and shale.
Length of day: Fourteen hours.
Time actually working: Seven and one half hours. (This includes the time consumed in ditching, dumping and traveling to and from the siding, clearing for trains.)
Crew used: Operator and two laborers. Train crew: Motorman and conductor.

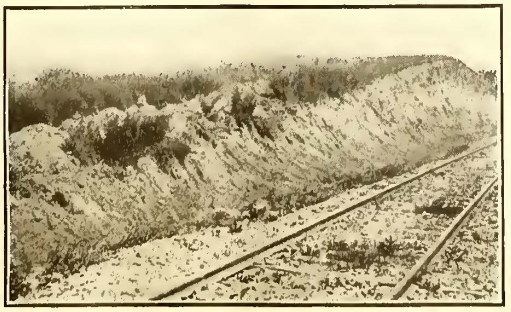
Daily Cost:

Payroll	$23.52
Power	5.00
Oil, waste and repairs	2.50
Incidentals	1.26
Total	$32.28
Average daily yardage	225.6 yd.
Cost per yard	14.3 cents

Besides being used for the above-mentioned work the ditcher has frequently been used as a pile driver by the simple attachment of a pair of leads, and it is also used in place of a crane or derrick for unloading ties, rails and machinery.

Americanization Means Efficiency

Foreign labor is used to a considerable extent for the heavier work in electric railway repair shops and for track maintenance gangs. For such, the efforts of the National Americanization Committee, Engineering Societies Building, New York, N. Y., possess an interest. Some experience along these lines is summed up by men prominent in the industrial and railroad field in the November issue of the *Efficiency Magazine*, a copy of which may be had from the committee by any executive who applies for it on his business letterhead.



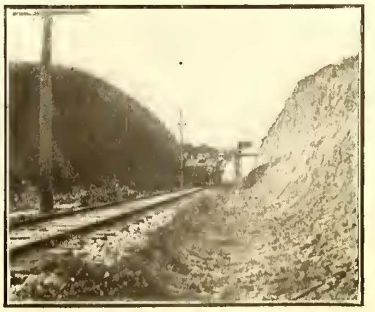
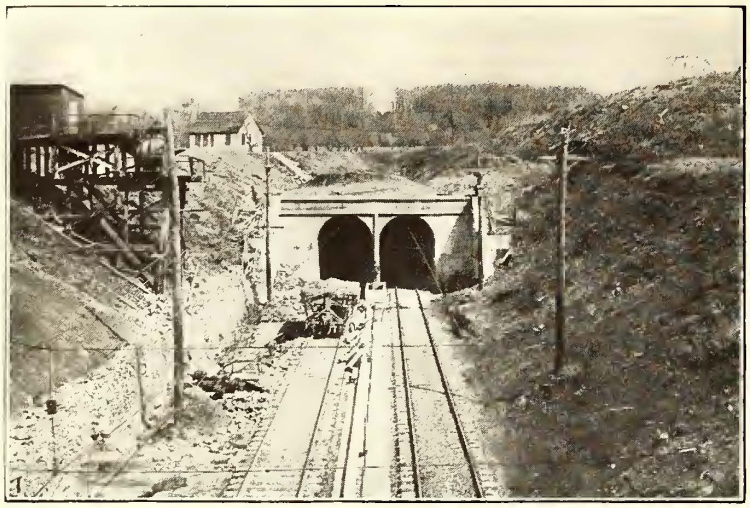
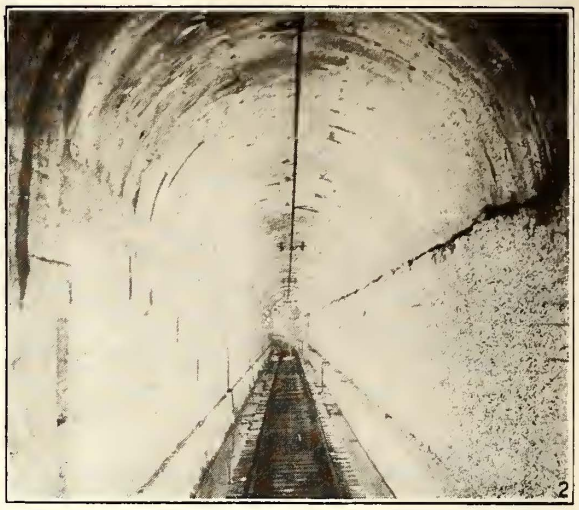
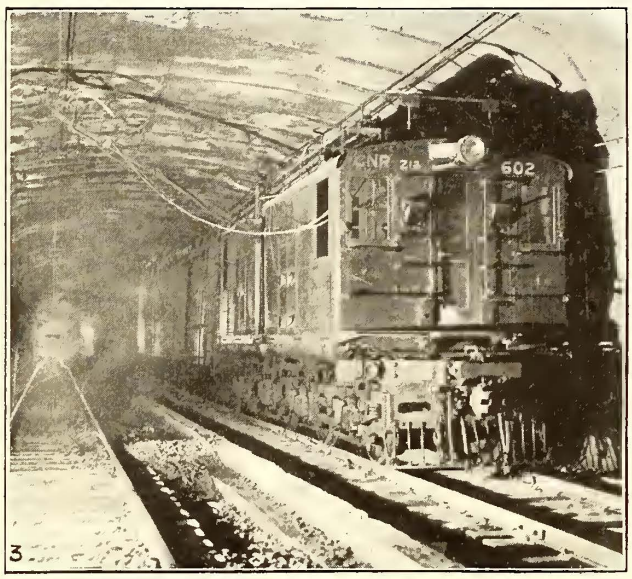
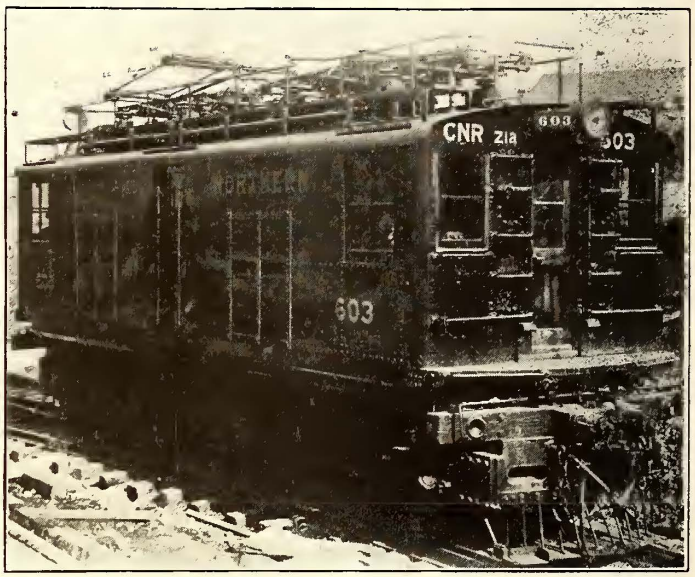


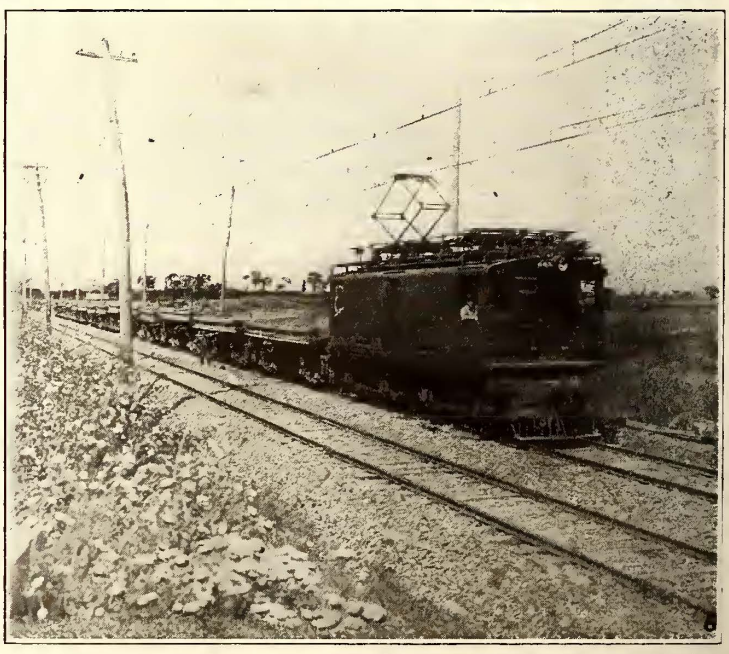
FIG. 3—WIDENING OUT FILLS WITH AIR-OPERATED 20-YD. SIDE DUMP CAR. FIG. 4—MATERIAL PLACED ON EMBANKMENT REPLACES SURFACE DITCH. FIG. 5—A TYPICAL CUT ON THE K. C., C. C. & ST. J. RY.











Electrification Scenes at the Canadian Northern Terminal

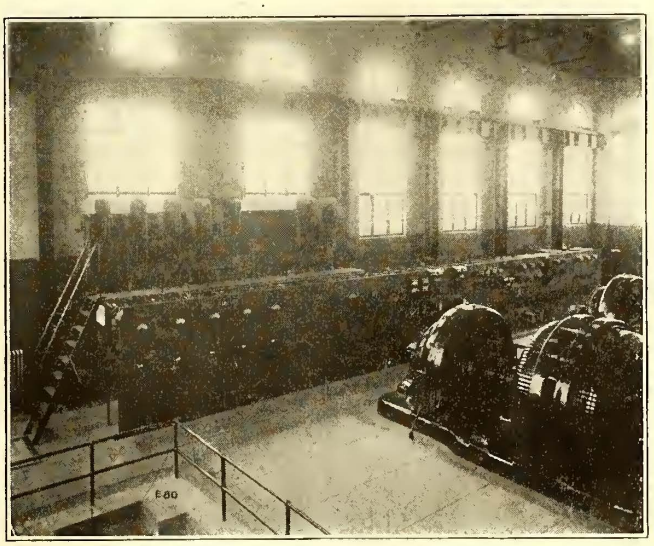
Fig. 1—Approach to west portal of Mount Royal Tunnel.
Fig. 2—Two-degree curve in the tunnel.
Fig. 3—Locomotive pulling in messenger and taking current from opposite track.
Fig. 4—Locomotive with low catenary construction.
Fig. 5—Control apparatus in operator's cab.
Fig. 6—Catenary construction on tangents.

Montreal Tunnel Zone Electrification[1]

The Author Summarizes the Details of the Rolling Stock, Overhead and Substation Equipment, and Gives Some Practical Information as to Design and Construction Problems[2]

BY WILLIAM G. GORDON
Transportation Engineer Canadian General Electric Company, Ltd.
Toronto, Ont.

THE CITY of Montreal is divided into two principal levels; the commercial and financial quarter being on a plain only a few feet above high water, and the residential and shopping district being at about a height of 75 ft. above the river. As the space between Mount Royal and the St. Lawrence River is limited, this district has become greatly congested, and business has largely forced the residence section up and down the river and around the mountain. The tunnel under Mount Royal was built to give the Canadian Northern Railway, now the property of the Dominion government, an entrance into the heart of the city and to render available for residential purposes a large area only a few minutes by train from the main terminal. The present terminal is located about midway between the two levels and it is proposed to extend an elevated line, at the same uniform grade, which will connect up with the proposed viaduct on the lines of the Harbor Commission, thus giving direct access to trans-Atlantic steamers and to all of the harbor facilities. The tunnel is 3.1 miles long and has a uniform grade of 0.6 per cent toward the city for drainage. To meet various physical conditions, different cross-sections were used, in hard sound rock, unsound rock and soft ground respectively. The twin-section type of tunnel was adopted for economy in construction, ease and economy in ventilation, and protection and safety in case of derailments or other accidents.



SWITCHBOARD IN THE SUBSTATION

In addition to working from both ends of the tunnel for construction purposes a shaft was sunk 1 mile from the west portal at Maplewood Avenue. The method employed in the tunnel construction was to drive a bottom center heading about 8 ft. high by 12 ft. wide. This heading could be driven ahead rapidly without much regard for the character of the ground, and from it the full-sized excavation could be developed at as many places simultaneously as was desired.

Four drills were used in each heading, supported on a horizontal bar. The drills were operated by compressed air at a pressure of about 100 lb. per square inch. The break-ups, where the upper part of the tunnel section was excavated to its full width and height, were opened at intervals of from 500 ft. to 800 ft. along the center bottom heading, the practice being to open up as many of these as was necessary to keep up with the heading progress.

The compressed air used for operating the drills and other pneumatic machinery was obtained from two plants, one at each end of the tunnel, with an aggregate capacity of 11,000 cu.ft. of free air per minute compressed to 110 lb. per square inch. The muck was handled by two 10-ton and one 8-ton trolley locomotives, and six 5-ton storage locomotives. The load diagram from which the electrical calculations were made was worked up from the data given in Table I, on page 964. Power is purchased from the Montreal Light, Heat & Power Company at 63 cycles, 11,000 volts, three-phase. It is delivered to a substation located near the west portal of the tunnel through a lead-covered three-conductor cable carried in a duct through the tunnel, reinforced by an overhead line to insure continuity of service. The general arrangement and capacity of the switching equipment provides for the later addition of a steam auxiliary plant at the Back River near the Cartierville yards for extension of the electrification of the main line to Ottawa.

The substation contains two motor-generator sets with provision for a third one, each comprising a synchronous motor, direct-coupled to, and on a common bedplate with, two 750-kw. 1200-volt d.c. generators, connected in series. The sets run at 600 r.p.m. The sets have an overload capacity of 200 per cent for five minutes, this heavy overload capacity being obtained through the use of a pole-face winding. This winding consists of tubes and rods located in holes near the pole faces and so connected as directly to oppose the armature reaction. The pole-face windings and the series

[1]Abstract of paper presented before the American Institute of Electrical Engineers at Toronto, Ontario, Nov. 22, 1918.

[2]Previous articles on the electrification of the Mount Royal Tunnel zone of the Canadian Northern Railway at Montreal, Quebec, will be found in the following issues of the ELECTRIC RAILWAY JOURNAL: March 4, 1914, page 572; Aug. 15, 1914, page 295; Sept. 29, 1917, page 585; Oct. 20, 1917, pages 709 and 725; Dec. 8, 1917, pages 1024 and 1039.

and commutating field windings are all connected on the ground side of these machines. The shunt fields of the generators and the synchronous motor fields are arranged for 125-volt excitation.

Each synchronous motor is started through a three-phase 11,000-volt compensator, that is, an auto transformer having one coil per phase with suitable starting taps brought out.

Each of the three exciter sets consists of a 50-kw., 125-volt d.c. generator driven by an induction motor. The generators are of the commutating-pole type, "flat compounded." A bank of six 100-kw. single-phase transformers supplies power to the induction motors and for miscellaneous station requirements.

All oil switches on the 11,000-volt circuit, excepting the synchronous motor magnetizing and starting switches, are inclosed in masonry cells and have two breaks per pole, each in a separate tank. The switches are motor-operated and open automatically on overloads, excepting the incoming line switches, either instantaneously or with a time-limit action as desired. The incoming line switches operate automatically on the reversal of power only.

The 2400-volt d.c. circuit-breakers and lever switches are mounted on a panel back of and above the main switchboard, and are operated by insulated handles on the front of the main board. They are mounted between fireproof barriers and are equipped with powerful magnetic blowouts. The field switches are mounted on a base back of the panels with the operating handles on the front of the main board.

TABLE I—TRAIN WEIGHTS AND SPEEDS ASSUMED IN MONTREAL TERMINAL ELECTRIFICATION

Class	Trailing Load, Tons	Speed on Level, M.P.H.	Speed on 0.6 per Cent up Grade, M.P.H..	Schedule Speed, M.P.H.
Transcontinental	1,130	37	26.5	21.2
Express and local	550	37.5	27.1	21.6
Over motor coach	60	50	41.5	22.2
Three motor coaches	180	50	41.5	22.2
Three motor coaches and two trail coaches	260	47.8	34.8	21.8
Freight	1,000	32.5	23.5	....

TABLE II—LOCOMOTIVE DATA

Length inside knuckles	37 ft., 4 in.
Length over cab	31 ft., 0 in.
Over-all height, pantagraph down	15 ft., 6 in.
Height over cab	12 ft., 10 in.
Over-all width	10 ft., 0 in.
Total wheelbase	26 ft., 0 in.
Rigid wheelbase	8 ft., 8 in
Total weight, all on drivers	83 tons
Wheel diameter	46 in.
Tractive effort at 30 per cent traction coefficient	49,800 lb.
Traction effort at one-hour rating	20,300 lb.
Traction effort at continuous rating	16,200 lb.
Speed at rated amperes, one-hour rating	23.4 m.p.h.
Total horsepower	1,280
Speed at rated amperes, continuous rating	24.6 m.p.h.
Total horsepower	1,090
Gear ratio	80:25

TABLE III—MULTIPLE-UNIT CAR DIMENSIONS

Length over buffers	67 ft., 5⅜ in.
Length over body corner posts	57 ft., 6¼ in.
Truck centers	42 ft., 9 in.
Width over side-sill angles	9 ft., 10⅛ in.
Width over eaves	10 ft., 2¾ in.
Height top of rail over roof	13 ft., 0 in.
Height top of rail to under side of side sill	3 ft., 7½ in.
Center to center of body side bearings	4 ft., 10 in.
Center to center of deck sills	5 ft., 6 in.

TABLE IV—OVERHEAD CONSTRUCTION DATA

Messenger outside of tunnel	S. M. steel cable ⅜ in., 7-strand
Ultimate strength of above	11,000 lb.
Elastic limit of above	6,600 lb.
Messenger inside tunnel	Phosphor bronze 0.9 in. 19-strand
Ultimate strength of above	22,000 lb.
Elastic limit of above	18,600 lb.
Cross-span, double-track	S. M. ⅜-in. cable, 7-strand
Cross-span yards, same width, in addition	S. M. ⅜-in. cable
Hangers	Long loop type
Standard hanger spacing	15 ft.
Height of contact wire, outside of tunnel	23 ft.
Height of contact wire in tunnel	16 ft.
Contact wire	No. 0000, grooved, special bronze
Breaking strength of above	65,000 lb. per sq.in.
Elastic limit of above	39,000 lb. per sq.in.

LOCOMOTIVES HAVE ONE-HOUR RATING OF 1280 HP.

The railway has six locomotives now in operation each equipped with four GE-229-A commutating-pole motors, connected in pairs in series for operation on the 2400-volt circuit. Each motor is rated at 325 hp. at 1200 volts, and is insulated for double this voltage. Ventilation for the motors is obtained by means of a blower located in the locomotive cab. The locomotives are geared for a free running speed on tangent level track of about 45 m.p.h.

The control provides ten points in the series position and nine points in the series-parallel position. The master controller used is of the non-automatic type with two handles. One handle regulates the applied voltage at the motor and the other controls the direction of rotation of the motors. The rheostats which furnish the external motor resistance are placed on the roof of the cab and are thus provided with natural ventilation. A special electropneumatic changeover switch is used for making the transition between series and series-parallel connections of the pairs of motors. The master controller and contactor energizing circuits are designed for 125 volts.

The current for operating the contactors and for lighting the cab and headlights is obtained from a motor-generator set, the motor of which has two 1200-volt windings and two 1200-volt commutators in series. This set is mounted in the center cab and also drives the blower for providing forced ventilation to the main motors.

Protection against overload is furnished by means of fuses of the copper-riveted type, placed in fuse boxes so arranged as to permit the fuses to blow into a common chamber where the arc can do no damage. There is also a knife-blade switch in the main circuit with an operating handle placed in a position for easy operation in case of emergency. This main switch also blows into the arc chamber mentioned and has a powerful magnetic blowout.

Other details of the equipment can be seen in the illustrations on pages 962 and 963. Attention is directed to the speedometer, which is similar to the type largely used on automobiles but which is especially designed for locomotives. The instrument is connected to the driving wheels of the locomotives by means of a flexible shaft and gearing.

Each of the locomotives has four axles, all of the weight being upon the driving wheels. There are two four-wheel trucks, articulated together by means of a heavy hinge and equalized by means of a semi-elliptic leaf spring over each journal box connected through spring hangers to the frame and to the equalizer bars.

The equivalent of a three-point suspension is thus attained through the side equalization of one of the trucks and both side and cross equalization of the other truck.

The friction draft gear is mounted in the end-frame casting of the truck, thus restricting the hauling and buffing stresses to the truck side frame and the articulated joints. The cab and apparatus are thereby relieved from the effects of severe shocks.

The cab, of the box type, is divided into three compartments, the center one for the apparatus and the end one for the operator. Each operator's compartment is supplied with controller, control switches, ammeter, air brake and pantagraph control, air gages, 2400-volt cab heater, bell rope and control for whistles and sanders. The locomotive thus has complete double-end control. The motors are nose-supported and geared to the axles through twin gears.

The air-brake equipment is of the combined straight and automatic type, including a 2400-volt motor-driven air compressor with a capacity of 100 cu.ft. of free air per minute.

Additional data of the locomotive will be found in Table II.

Multiple-Unit Motor Cars Will Be Added Later

Local traffic will be handled by means of multiple-unit motor cars which will weigh, loaded, about 80 tons. Dimensions of these cars will be as shown in Table III.

These cars will be equipped with four fully-ventilated GE-239-A, 125-hp., 1200-volt commutating-pole motors, insulated and connected like the locomotive motors. They will, however, be ventilated by means of fans on their own armature shafts. The control will be of the non-automatic type with five series steps and four parallel steps.

The multiple-unit cars will be heated by an electric hot-air system, one complete heater being placed underneath the car and receiving its power direct from the 2400-volt supply. The heater will have a capacity of about 25 kw. and will be arranged for two heat combinations. Each complete heating equipment will consist of the heating unit, the blower with its regulating mechanism, the controlling switch and the thermostat. The regulating equipment will be operated from the 600-volt supply furnished by a motor-generator set. The air will be forced over the heating unit by means of the blower and distributed throughout the car by means of air ducts along the side. The blower motor will be connected in series with the heating unit on the ground side. The motor-generator set referred to, of course, is primarily for the supply of 600-volt current to the control circuits, the air compressor and the lighting circuits.

Catenary Construction Was Somewhat Unusual

Special local conditions and the extremely low temperature which must be encountered were features which made the design of the catenary system for this electrification somewhat out of the ordinary. The electrified track at present is about 10 miles in length, and in this distance there is a passenger terminal station and coach yard in the city, a double-track tunnel, double tracks in a cut with low clearances under highway bridges, a long stretch of single track both tangent and curved, and a large freight yard with repair shops and storage tracks. The temperature sometimes reaches 30 deg. below zero, while in the hottest summer weather it may go as high as 110 deg. in the sun. In the early spring severe sleet storms sometimes occur.

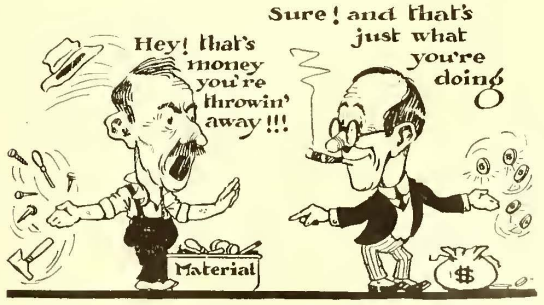
In general the poles used are of Eastern white cedar, treated with creosote oil, steel poles being used in the terminal yard in the city on account of their more sightly appearance. On single track the poles are spaced 150 ft. on tangents and 120 ft. on the 2-deg. curves. On the double-track portion, where the overhead clearance is limited, the spacing is reduced to 105 ft. on tangents. Some data of the overhead construction are given in Table IV.[1]

The messenger outside the tunnel consists of ½-in. steel cable anchored every half mile, with bracket construction on the single-track portions and cross-span suspension on the double-track portions. Inside the tunnel where the overhead clearance is limited the catenary had to be quite flat, and the messenger therefore pulled up very tight. For this reason a cable of phosphor bronze was selected with an over-all diameter of about 0.9 inch. The ultimate breaking strength of this is 22,000 lb. and the elastic limit 18,600 lb. This messenger is supported every 90 ft. from the roof of the tunnel by a combination of iron yokes held in the concrete.

The contact wire is No. 0000 A.E.R.A. standard grooved trolley wire. This wire was selected rather than hard-drawn copper wire both because of its longer life when subjected to the wear caused by sliding pantagraphs and because it could be pulled up tighter than copper. This latter point was considered especially important on account of the wide variation in temperature in Montreal and the consequent great variation in the sag which there would be with ordinary copper trolley wire between winter and summer. The contact wire is supplemented by two No. 0000 feeders, one running the full length of the electrification outside the tunnel and the other extending about 1 mile west of the substation.

Say, You're Throwing Money Away!

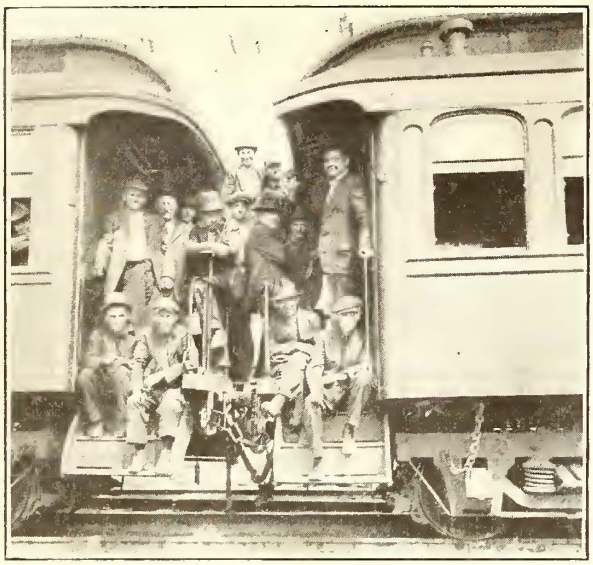
The accompanying cartoon from a recent leaflet for employees, prepared by the Columbus Railway, Power & Light Company, furnishes material for thought. This



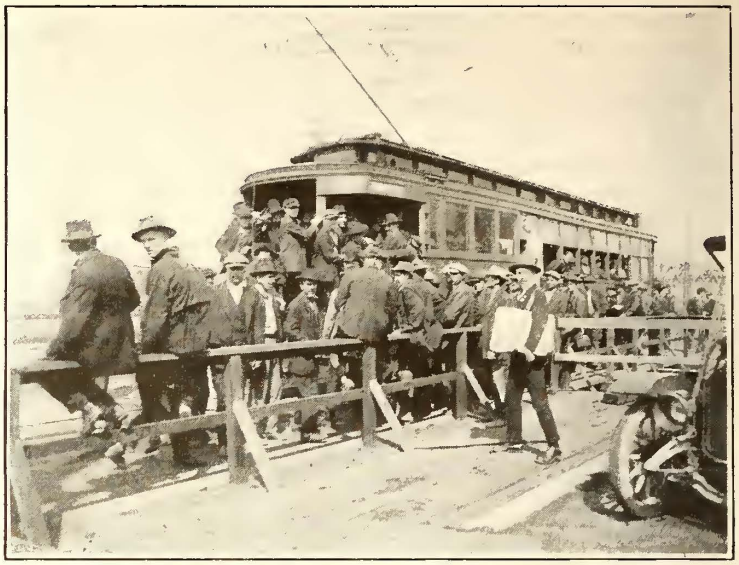
CARTOON USED BY C. R., P. & L. CO. TO INDUCE ECONOMY ON THE PART OF EMPLOYEES

company is making a consistent effort to induce its employees to think of the supplies they use in terms of dollars and cents.

[1]Full details of the overhead design will be found in an article by W. C. Lancaster in the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 8, 1917, page 1024.



PATRIOTIC WORK AT HIGH PAY WITH FREE STEAM RIDES OUGHT TO MAKE ANYBODY SMILE



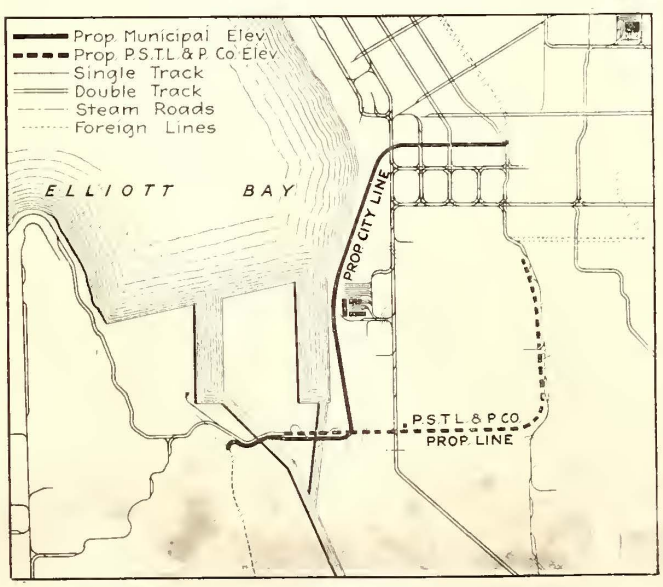
PLAYING THE POPULAR GAME OF "TAKE THE FIRST CAR OUT AND AVOID PAYING FARE"

Carrying Seattle's Shipbuilders

The Local Electric Railway, Steam Lines and Municipal System Are All Working to Speed Up Ship Construction

THE prominent place which Seattle occupies in the shipbuilding world is so widely recognized that no description of its many plants is needed. Let it be said, however, that with one exception all the big shipyards of Seattle are located in the tideflats section south and southwest of the traffic-distributing center of the city. Scarcely a year ago this district was almost a desert, so that three routes were ample. To-day there are many thousand more workers located there, and the question of giving them practical relief has been a pressing one.

Fortunately, even under the present conditions, relief is afforded by the fact that the bigger plants work on three shifts and that the shifts at different plants overlap in some cases. Still more fortunately, the greater part of the afternoon shipyard crowd has been distributed over the Seattle lines before the old-time city peak begins. The greatest difficulties occur in the morning.



MAP OF P. S. T., L. & P. CO. LINES IN SEATTLE

The management of the Puget Sound Traction, Light & Power Company saw at once that its First Avenue double-track surface line could not be expected to give fast and ample service, for it was already well loaded down with all the West Seattle, South Park and Tacoma interurban cars on a highway which is congested also by many other vehicles—not the least to-day being the touring cars of hundreds of shipworkers! Therefore, it suggested the use of steam trains and also of the Elliott Bay Municipal ferry. As the trains carry ten coaches each, it can be seen that they are of real value in bringing thousands of men to the traffic center of Seattle instead of having the short-handed electric railway attempt to give much more mileage where effective movement is impossible.

There are two steam routes. The more important, known as the West Waterway, parallels the electric lines from Occidental Avenue and King Street. The train makes two trips, the first to the Duthie and the Ames yards and the second to the Erickson and Elliott Bay plants. Returning in the afternoon, the train leaves the Duthie plant at 3.40 and returns for a second trip, leaving the Erickson plant at 4.15. The second trip serves also the Ames and Elliott Bay yards.

The East Waterway train makes one round trip morning and evening. Like the West Waterway train, it carries the workers free to the downtown section, from which they walk or ride on the street cars.

The steam service, which was begun in April, carries about 4500 men at a daily cost of $400 to the United States Shipping Board. If the men ever pay for their riding, it will be necessary to use prepayment areas or tickets as the rides are too short for cash collection on the cars. Furthermore, the men are reckless riders at best. On the electric cars smashed windows and stolen lamps are a matter of course.

The Puget Sound Traction, Light & Power Company is also doing its best to help. Many lines have been rerouted to give through service for the extraordinary morning peaks. Loading has also been diversified by carrying some cars around Jackson Street to load on

third Avenue with people from the north and east ends of the city and with transfer passengers from the cable lines.

To maintain good voltage and speed conditions in the shipyard district the company has already placed one 500-kw. rotary converter in a substation at First and Spokane Streets and a second 500-kw. unit is to follow. Fifteen trailers have also been added.

As a further aid the city of Seattle made arrangements with the Emergency Fleet Corporation for a loan of $300,000 for extensions to the Seattle Municipal Street Railway and the purchase of thirty-one cars. The city ordered six single-truck and twenty-five double-truck cars, but recently the government notified the city authorities that the loan would not be made. The city has therefore made plans to care for the proposition.

Pneumatic Car Provides Efficient Method of Handling Sand

By the Use of a New Sand Car the Regular Train Crew Takes Care of Sand Transportation Which Previously Required Three Men in Addition to Crew

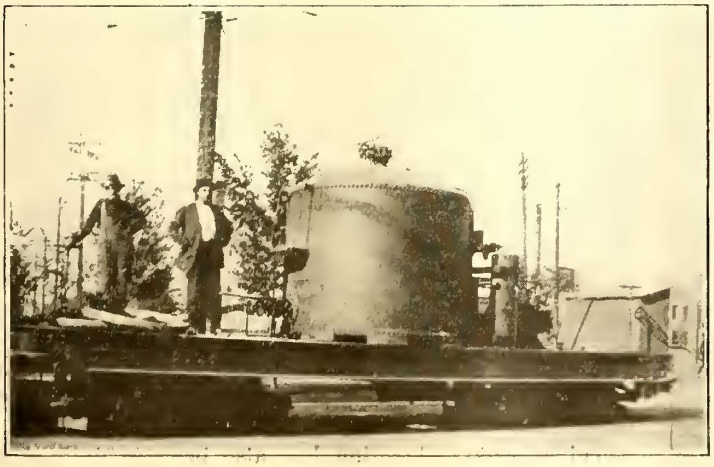
BY W. L. WHITLOCK
Office Engineer Denver (Col.) Tramway

THE present shortage of labor and the increased labor cost led the officials of the Denver Tramway to seek a more efficient method of handling sand than the one previously used. Under the old system a flat car was loaded with approximately 14 cu.yd. of dry sand and served as a source of supply both for storage purposes and for filling street sand boxes. The filling of the sand boxes from the car was done by means of 12-qt. pails, and usually three men in addition to the train crew were required for this service. In addition to the extra men required, this method was expensive and slow, particularly during wet, stormy weather when it was necessary to cover the sand to keep it dry. A large tarpaulin thrown over the sand car was used for this purpose.

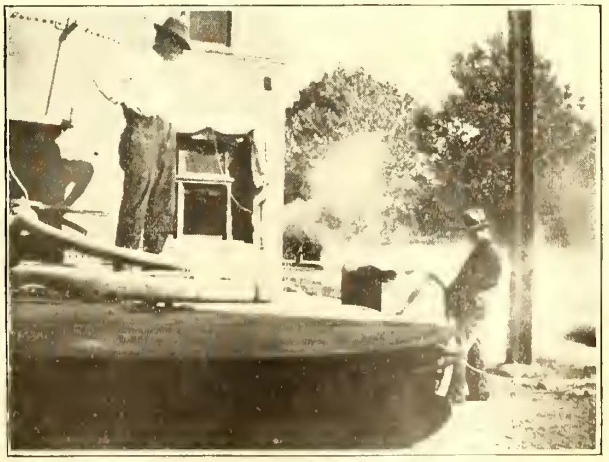
The pneumatic sand car recently constructed by this company is 35 ft. long over all and has a steel underframing of 15-in. channels. It is of double-truck construction and equipped with air brakes. Due to the present shortage of motors and equipment it is used for trailer operation only. The car weighs 50,100 lb. when loaded and 29,600 lb. empty. Its construction follows the general lines of the sand cars of the Philadelphia Rapid Transit Company and the United Railways of St. Louis, descriptions of which were published in the ELECTRIC RAILWAY JOURNAL issues of April 25, 1914, and Aug. 10, 1918.

The sand tank and car frame were built in the local shops of this company and the entire car was assembled here. The sand tank is 6 ft. x 7 ft. 6 in. in dimensions and has a net capacity of 8½ cu.yd., or approximately 10 tons. The air pressure used for unloading the sand is furnished by a D4K Westinghouse motor-driven air compressor mounted on the sand car. Air connections are also provided so that the compressor of the motor car used to draw the sand car can be used for helping out in the supply of the air necessary for unloading the sand. So far the only time that it has been found necessary to use the compressor of the motor car is when large storage bins are filled and the tank is emptied completely in one operation. The complete unloading can be accomplished in a half hour.

The compressor on the sand car is cooled by means of a water jacket. The necessary water supply is obtained from a storage tank mounted on the car. The air compressor which we made use of was one which we



SAND CAR LOADED READY FOR OPERATION



FILLING A SAND BOX ALONG THE LINE

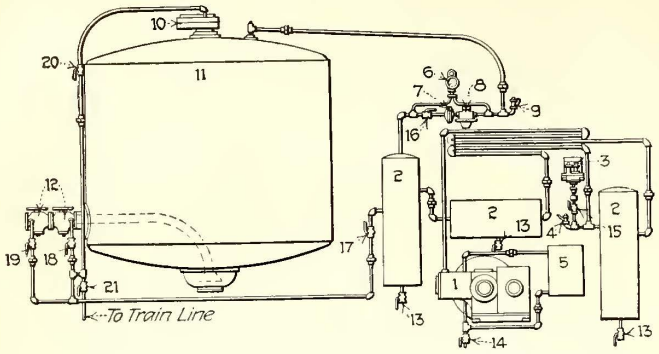


DIAGRAM OF PIPING FOR SAND SUPPLY CAR

(1) Compressor; (2) reservoir; (3) governor; (4) safety valve—high pressure; (5) water tank; (6) duplex air gage; (7) air strainer; (8) pressure reducing valve; (9) safety valve—low pressure; (10) filling valve; (11) sand tank; (12) blow-off cock; (13) drain cock to reservoir; (14) drain cock to water tank; (15) cock to cut off air from governor tank normally open; (16) cock to cut off air from sand tank normally open; (17) cock normally open; (18) cock normally closed to clean out cock and pipe inside of tank; (19) cock normally closed opened to clean out hose; (20) cock normally closed opened to clean out filling valve; (21) cock normally closed opened to connect to train line.

had on hand. Experience has shown that one of slightly larger capacity would be more desirable. For unloading the sand 25 lb. air pressure is used.

The air-piping diagram is shown in an accompanying illustration. Three receiving tanks, two of which are 14 in. x 48 in, and one 14 in. x 33 in., take the air from the compressor at from 60 lb. to 75 lb. pressure. A reducing valve, installed between the last tank and the air connection to the top of the sand tank, reduces the pressure to the working value of 25 lb. The tank is filled from sand bins by gravity through a valve in the top. After filling, this inlet valve is closed and the air compressor is started while the car is on the road to its destination, so that on arrival no waiting for air pressure is necessary. A 2½-in. rubber sandblast hose conveys the sand from the tank to sand boxes or bins. This hose is 40 ft. long, and is divided into two sections for convenience so that a shorter length can be used where the full length hose is not required. The usual type of sand box which is located at the end of the car lines is filled in five minutes. The capacity of these boxes is 1 cu.yd.

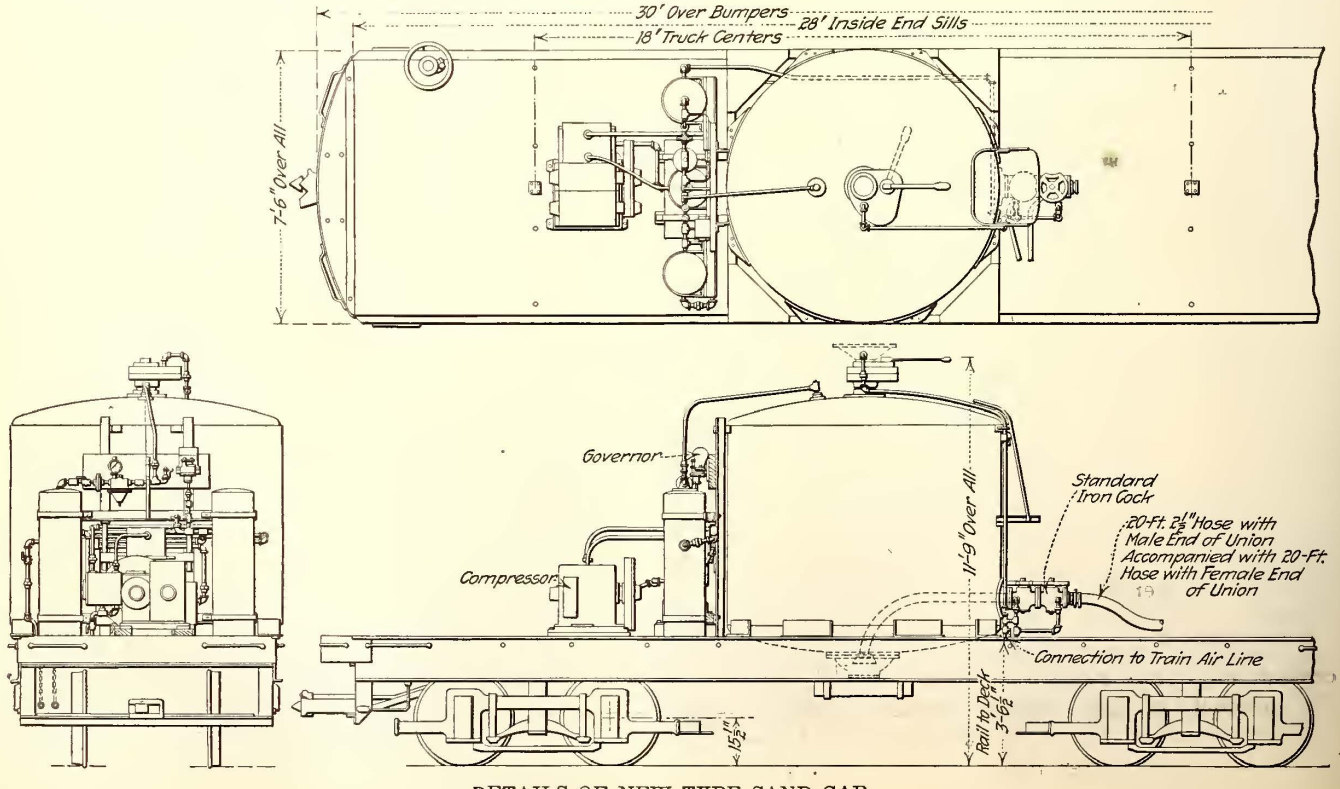
Small air lines are tapped into the tank at the inlet and outlet valves. By means of these lines sand can be blown away from valves in case there is any tendency of the sand to stick or pack at these points. In addition these hose lines provide an effective method for cleaning valve seats which facilitates the valve operation.

A motorman and a brakeman are the only men required to operate this equipment, thus producing a saving of three laborers and a large part of the time necessary for filling boxes.

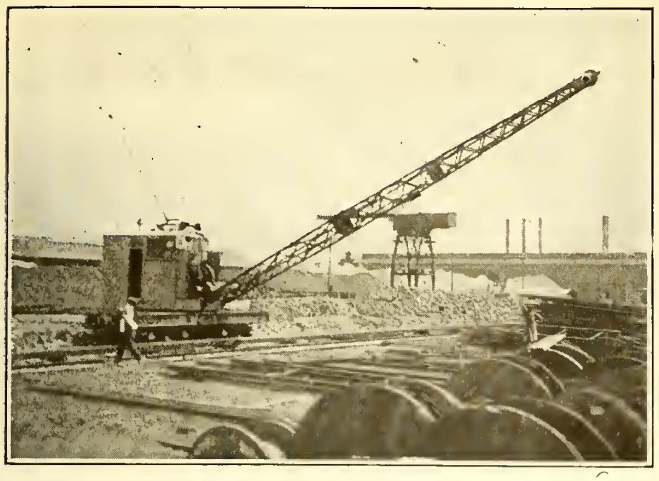
Double-Drive in Belfast

In the issue of the ELECTRIC RAILWAY JOURNAL for July 4, 1914, page 34, A. A. Blackburn, chief engineer Belfast (Ireland) City Tramways, described a double-pinion drive which had been introduced on the cars of the municipal tramway. In response to a recent inquiry as to the results which have been secured Mr. Blackburn states that in consequence of the shortage of gears and pinions due to the war the City Tramways was obliged to rob all of the cars so fitted up of the extra gears and pinions. This necessary return to the old-time single drive, however, is only temporary and as soon as conditions permit the extra drives will be restored as the results were very satisfactory.

In order to relieve congestion on the electric railways in Tokio, Japan, an auto-omnibus company has been formed with a capital of $5,000,000. Not only are passengers to be transported but freight is to be carried and the automobiles are to be manufactured.



DETAILS OF NEW TYPE SAND CAR



ELECTRIC CRANE HANDLING SPECIAL WORK, GANTRY CRANE IN BACKGROUND

PORTABLE CONVEYOR LOADING PAVING BLOCK AT HARVARD AVENUE YARD

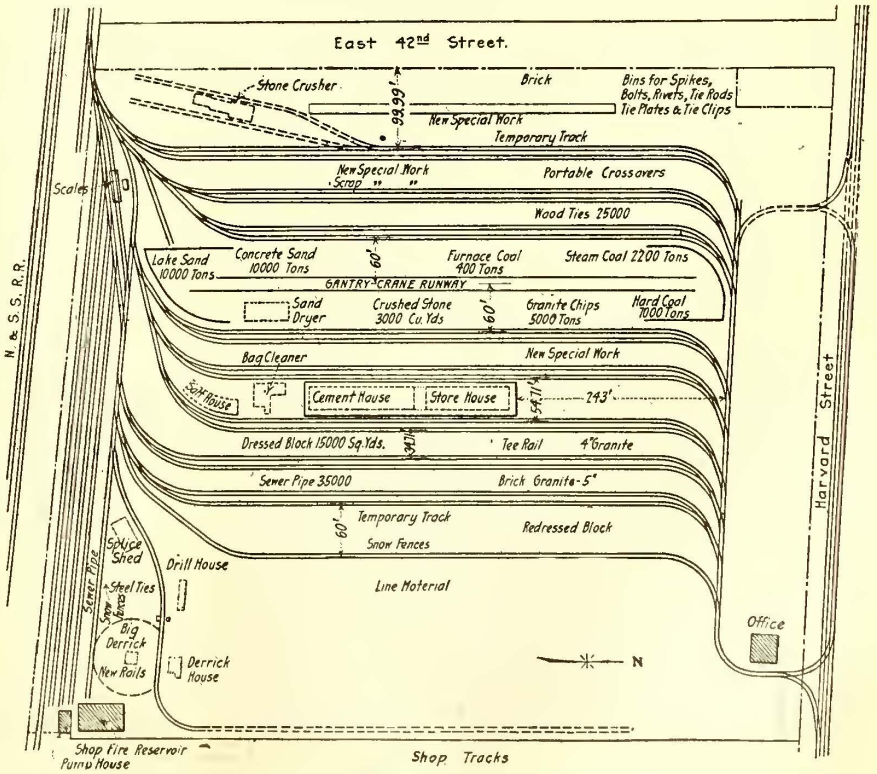
New Equipment in the Harvard Avenue Yard, Cleveland Railway

During Two Years the Track Maintenance Yard of the Cleveland Railway Has Been Taxed to Capacity, Necessitating Increased Facilities

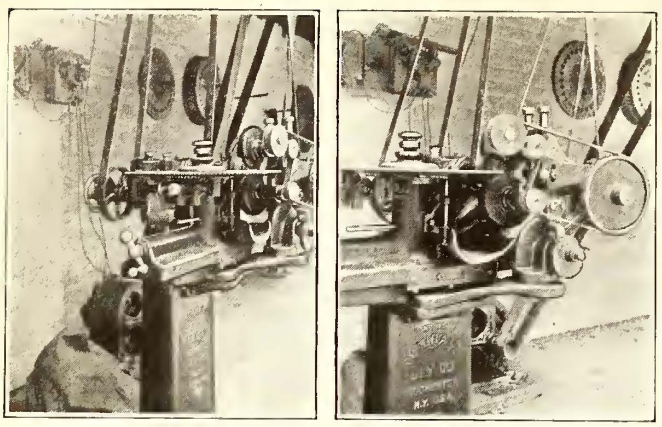
THE Cleveland (Ohio) Railway has a large maintenance yard adjacent to the Harvard Avenue shop which is devoted to the work of the way department. When the yard was laid out a small building was provided for office purposes. This is now being enlarged and in future the work of the department will be administered from this point. In the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 24, 1917, was an illustrated account of the development of this yard with pictures showing it in a rather incomplete condition. Since then almost the entire area of the yard has been put to constant use and is now a scene of very great activity. Some photographs taken recently to show the present appearance of the yard are reproduced herewith, which will be interesting for comparison with those accompanying the earlier article.

One of the novelties in the way of equipment in the yard, recently put into service, is a portable elevator or conveyor, which is driven by an electric motor. This consists of an endless belt, equipped with "flights," traveling in a trussed boom hung from a frame mounted on a two-wheeled truck. The conveyor is hung from the frame by means of steel cables permitting convenient adjustment. It is shown in the operation of loading paving stone on a gondola car. It is also adapted to loading and unloading coal, cement, etc. The conveyor shown is the product of the Barber-Greene Company, Aurora, Ill. It is made on what the manufacturer terms a sectional basis, there being three principal parts, the drive end, the take-up end and the "intermediate." These parts may be combined to form conveyors of any practicable desired length.

The most conspicuous feature of the yard is an enormous gantry crane with its cantilever truss 62½ ft. long from center of rotation to outer end. This great crane travels on a runway 1000 ft. long and commands large storage spaces for coal, paving brick, etc. It



LAYOUT OF HARVARD AVENUE YARD, CLEVELAND RAILWAY

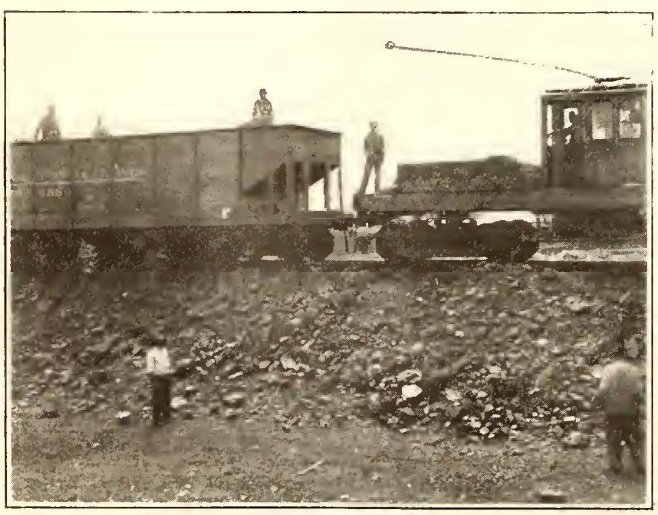


SAW-GRINDING MACHINE INSTALLED IN STORAGE HOUSE

has later been supplemented by a 15-ton Ohio electric locomotive crane with clamshell bucket attachment, which is used for handling special work and miscellaneous heavy materials. On this crane hoisting is done by means of double drums driven by a Westinghouse 75-hp. 550-r.p.m. type-MC series-wound 600-volt d.c. motor equipped with an R-164 drum controller and railway-type circuit breaker. The boom is 50 ft. long and, regardless of its position, the lifting capacity on level track and without the use of riggers and clamps ranges from 30,000 lb. at a radius of 12 ft. to 4200 lb. at a radius of 50 ft. The hoisting speed with a single line and 10,000-lb. load is 150 ft. per minute; with a two-part line at 20,000-lb. load it is 75 ft. per minute and with a three-part line and 30,000-lb. load, 50 ft. per minute. The crane is mounted on an eight-wheel double-truck flat car equipped with 600-volt d.c. motors, and the height from top of rail to top of cab is 16 ft. A short time ago this crane was considerably overloaded with the boom swinging at a large radius and without riggers and clamps attached. As a result of this overloading the equipment was overturned. No serious damage was done and the crane was quickly set back on its "feet" by means of a derrick which happened to be handy.

A large quantity of coal has been stored in the yard during the past year, and during the summer a pile became overheated and had to be moved. The way department of the company is supplied with a large number of Differential dump cars and these were utilized in making the transfer. Standard steam railroad hopper-bottom coal cars were also utilized. In repiling the coal the expedient shown in one of the illustrations was adopted. This is well known in steam railroad practice. It consists simply of placing a tie in front of the forward wheel of the rear truck and using this as a spreader while the coal is being dumped on the track and the car is being hauled forward.

GROUP OF VIEWS IN HARVARD AVENUE YARD, CLEVELAND RAILWAY, TAKEN FROM GANTRY CRANE



SPREADING COAL ON PILE BY MEANS OF TIE BLOCKING REAR TRUCK WHEELS

The department has also installed in the storage house, which is located in the center of the yard, a pair of machines for grinding track saws. The machine is a special grinder built by the Cochrane-Bly Company, Rochester, N. Y., and its appearance is shown in the two views reproduced. It formerly cost $2.10 to regrind a 7-in. saw but now this can be done for 25 cents. From fifteen to twenty minutes is required to regrind a saw of this size, and ordinarily there are about fifty saws to be reground per month. The two machines installed give ample reserve grinding capacity.

Car Announcing System

In the article on the car announcing system at the Forest Hills Terminal of the Boston Elevated Railway, printed on page 883 of the issue of this paper for Nov. 16, no statement was made as to the authorship of the design and the shops in which the equipment was built. The plans were drawn up by John Hamilton, chief electrician Boston Elevated Railway, and the equipment was built in the company's shops.

Some British Experiences and Opinions Regarding Car Axles

Failures of Car Axles Are Discussed and Some Information Given as to the Most Probable Causes

In the Jan. 12, 1918, issue of the ELECTRIC RAILWAY JOURNAL, was published an article on "Experiences with Interurban Car Axles" by A. B. Metcalfe, then master mechanic Empire State Railroad Corporation, Syracuse, N. Y. This article was reprinted by the *Electric Railway & Tramway Journal*, London, and as that paper considered the subject of practical interest to British electric roads, the editors invited expressions of opinion thereon. The following is a summary of some of the most interesting views of British managers and engineers which were received:

C. J. Spencer, general manager Bradford City Tramways, considers that the fitting of a sleeve to carry the gear independent of the car axle as described by Mr. Metcalfe is only of protective value against dislocation of traffic where breakage of an axle has occurred between the car and the gear-wheel hub. Mr. Spencer considers the method of inspection for fracture outlined by Mr. Metcalfe as very drastic, as axles subjected to this treatment would have to be scrapped or fitted with special small bore wheels. He considers the old method of wiping over the axle with paraffin, rubbing it dry and striking its end a heavy blow as a much more profitable way of discovering fatigue fractures.

Two ways are outlined for overcoming liability of axles to fracture; the one most commonly adopted being that of increasing the diameter of the axle at the place liable to fracture. The second method is that of using a steel with physical characteristics giving sufficiently high yield point while retaining adequate elongation to give resistance to fracture from shock. A combination of these methods would enable axles of minimum dimensions to be used.

Axles supplied with the equipment purchased for the Bradford Tramways in 1898 and 1902 invariably fractured through the gear keyway. The axles at that time were 3¾ in. in diameter, with maximum load on each of 13,000 lb. They were of Bessemer steel having 33 to 35 tons tensile strength, yield stress not known.

A change was made in 1905 to axles 4 in. in diameter made from Siemens open-hearth steel, each carrying a maximum load of 14,500 lb. With these axles fractures occurred between the outer ends of the keyway and the car-wheel hub. The average life of these axles was about 100,000 miles.

In 1910 axles of 4-in. diameter were obtained, made of Siemens open-hearth acid steel, oil-toughened and having a maximum tensile strength of 45 tons, with 25 per cent elongation. Those which have broken have given an average life of 150,000 miles. Many are still in service.

In 1912 nickel-chrome axles, 4¼-in. diameter were purchased, having a composition of carbon 0.3 per cent; manganese 0.5 per cent; nickel 3 per cent, and chromium 0.6 per cent; sulphur and phosphorus each under 0.035 per cent. In this steel the maximum stress was not less than 55 tons, the elastic limit 75 per cent and the elongation 77 per cent. These axles are subjected to a carrying capacity of 16,000 lb. each and are fitted to four-wheel cars having 6-ft. wheelbase, 4-ft. gage, 16-ft. body, 27 ft. 6 in. over all, and fitted with covered upper deck. The cars have seating accommodation for sixty-one passengers.

So far out of 120 axles only three have broken, with an average mileage of 166,000. Steels having the higher maximum stress and yield point have not yet been tried, but in the latest axles, 4¼-in. diameter at the motor journals, the gear-wheel fit has been increased to $4\frac{9}{32}$ in., and solid wheels have been adopted in place of the split wheels formerly used.

Due to the complexity and uncertainty of the stresses to which tramcar axles are subjected, it does not appear possible to make any trustworthy calculations as to the minimum dimensions of axles of any given material which would successfully withstand the stresses to which they are subjected. The determination of details for the most economical type and sizes of axles for various equipment can only be decided by experience. Unfortunately, existing traction motors in use in England provide for only a limited diameter of axle through the motor journals which would result in a big contrast in diameter of the axle if the gear and car wheel fits were greatly increased. There would thus appear to be a risk of transferring the liability of fracture from the present position in which they occur to the point of reduction in diameter at the junction between the gear-wheel fit and the motor journal.

EXPERIENCES ON THE BRIGHTON TRAMWAYS

William Marsh, engineer and manager Brighton Corporation Tramways, writes as follows:

It is well known that narrow-gage systems suffer much more from broken axles than standard gage, and also that axles on wheels dished outwards, as is sometimes the case on very narrow-gage systems, are much more liable to break than where the wheels are dished inwards, as they generally are on standard-gage systems. The gage here is 3 ft. 6 in. with no dish at all on the inside of the present wheels, although originally the chilled iron wheels were dished outwards slightly.

About sixteen years ago we had about fifty to sixty axles break each year, or one and one-fourth axles per year per car. The original ones were 3¾ in. diameter with deep-cut keyways, and they all broke at the same spot, namely between the gear and driving wheels at the sharp end of the keyway.

The diameter was increased to 4 in. without result, and later to 4¾ in. at the wheel seats, and the material used instead of high carbon was altered to low carbon basic Bessemer rolled bars wihout heat treatment.

These axles, which we turned up ourselves, ran for many years without one breaking, and up to date I doubt whether 10 per cent have broken in a period of more than ten years, so that the trouble has been practically overcome.

The cracks start, I think, when the wheel strikes the tangent point of a curve at too great a speed, and then gradually spread much like cracks spread by degrees through glass, although a cracked axle may take years to actually break. Broken axles are not the same danger on trams as they are on railways, owing to the reduced speed.

Incidentally, the increase in diameter of the axles rendered a corresponding increase in the gear wheel hubs essential. These hubs are now 8 in. diameter.

In my view, the cure for broken axles should be partly an alteration in design and partly an alteration in the materials used, and the various points can be summarized as follows: (1) Use soft steel in preference to hard. (2) Increase their diameter at the wheel seats. (3) Use inwardly dished wheels if possible. (4) Cut the keyways in a milling machine with a fairly large diameter cutter instead of using an end mill. (5) Increase the radius of curves in the track as much as possible. (6) Spiralize all curves at the entering end.

Arthur Ellis, city electrical engineer and manager, Cardiff Tramways Department, states that during the first ten years of local operation no breakage of car axles was experienced, but since that time there have been a few breaks. Most of the axles in use were 3¾ in. in diameter, turned to 3½ in. at the journals. During the past four years they have been renewing these with 4-in. axles with boat-shaped keyways, with steel made to British standard specifications, and in some cases special nickel-chrome axles were supplied by John Baker & Company. These latter axles have not been in service a sufficient length of time as yet to determine whether they will eliminate further breakage.

R. H. Wilkinson, general manager and engineer Huddersfield Corporation, reports that he has found satisfactory results from increasing the diameter by ¼ in. at both the gear and the wheel seats, the axles being 4 in. at other points. He finds that bad track conditions have increased axle breakages.

Manchester Uses Large Diameter Axles and High-Grade Steel

J. M. McElroy, general manager Manchester Tramways, states that for many years his practice has been to use axles of as large diameter as possible and make the wheel and gear seats from ¼ in. to ½ in. larger than the remainder of the axle. Steel with from 35 to 40 tons tensile strength and an elastic limit of 50 to 60 per cent has given good results. Mr. McElroy calls attention to the necessity for careful machining of axles with no abrupt changes of section. He finds that a small keyway with a tight fit gives the best results.

A. R. Framley, general manager Sheffield Corporation Tramways, says that since 1910 his road has been using nickle-chrome steel axles, 4¼ in. diameter, with no keyways in the axles or gears and has had no breakages.

H. England, general manager Yorkshire Electric Tramways, states that he has been obtaining a life of from 150,000 to 300,000 miles from axles which are but 3¾ in. diameter, having split gears and ordinary keyway. He favors a larger diameter axle, however.

Result at South Lancashire

E. H. Edwardes, general manager South Lancashire Tramways, sent in the following report from his shop superintendent, W. J. M. Wilson:

Position of breakages placed in the order of percentage of breaks. They are all with 3¾-in. axles, No. 1 being about 95 per cent, remainder divide between 2 and 3. Nos. 4 and 5 not included.

1. Cracks and breaks at the end of the key-bed on the outer side of the gear-wheel boss.
2. Cracks and breaks at the inner side of the wheel nearest the gear.
3. Cracks and breaks at the inner side of the wheel furthest from the gear.
4. Breaks in the center of the gear wheel.
5. Inner edge of the journal (or at the shoulder between the bearing and the oil ring).

(1) In this particular break it is the weakest point of the axle, and it is made weaker by a sudden key-bed, in some cases a key-bed being provided 6 in. to 7 in. long by 1 in. wide and ½ in. deep; it is also the point which receives the first and greatest strain from the motor. Methods adopted to overcome this: Axles increased from 3¾ in. to 4 in., and made from a thoroughly well-forged, tough, oil-hardened steel, 30 to 40 tensile, the position of the gear wheel being increased to 4½ in. with no key-bed, split gear wheel pressed on to position.

(2 and 3) These cracks and breaks have only occurred with 3¾-in. axles, the increase in the diameter and the better quality of steel have improved matters so far, that after ten years' trial we have not yet had one broken.

(4) This type of break is very rare, and I merely mention it in passing, as one of the peculiar features was that several were discovered at the depot, having given no trouble on the road, although apparently having been broken some time; and as this system is a single track with frequent loops it makes it all the more surprising.

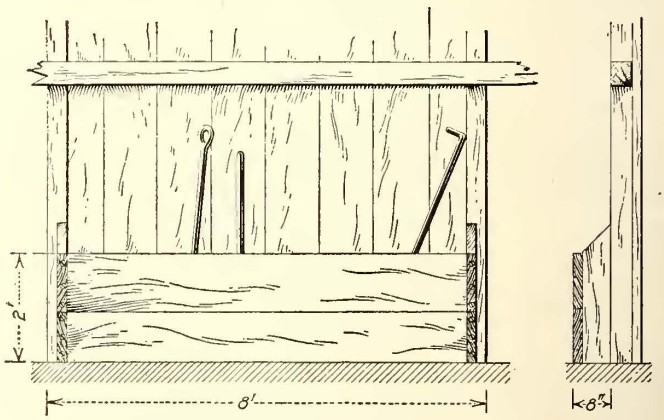
(5) This fault was due to a poor class of axle—in fact, rolled steel and the axles were supplied with twenty-four new cars. I have never had a break with a good-class axle.

General Observations.

1. Split gears previously mentioned are pressed on at 20-25 tons per square inch according to the stretch of the bolts, with an allowance of 0.0312 between bore and shaft, the bolts being increased from ¾ in. to 1 in. mild steel.
2. On our latest trucks, which we have increased to 7 ft., the Brill Company has designed springs to withstand a total load of 33,000 lb.
3. To insure getting forged axles of a good tough quality material, we get them in the rough and machine in our shops.
4. Gear wheel and wheel bosses are well radiused at the bored edges.
5. We thoroughly paint the gear wheel bosses, shafts, and bosses of the wheels with a good thick coat of white lead paint, well mixed with scrap varnish to keep out the water. This method was also applied to the key, key-bed, and inner surfaces of the gear wheel before fixing and bolting together.
6. The use of split gears pressed on is a good support to the axle, as a good grip is insured; by the old method, one portion of the gear was on the axle and the other chiefly on the key.

Wrench Pocket Beside Pit Track

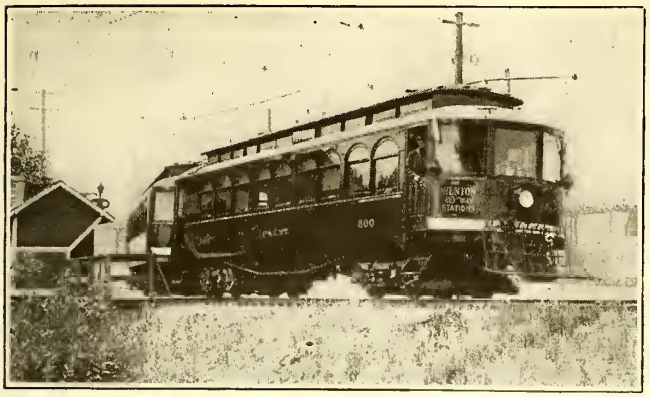
IN A New England car shop the practice of putting away truck and other wrenches nightly has been simplified by constructing a pocket 24 in. high and 8 in. deep for a distance of 8 ft. against the carhouse wall, parallel to the pit track, as shown herewith. The pocket is made of wooden planking 1¾ in. thick, and is attached at each end to the wooden column adjacent. Despite the



STORAGE PICKET FOR PIT TOOLS

extreme simplicity of the scheme, it has saved much trouble formerly experienced from car maintainers leaving crowbars and wrenches in the pits or on the intermediate flooring. It withstands rough usage and enables the wrenches to be disposed of at night and used for work in the morning with minimum loss of time and without the necessity of disturbing the storekeeper for a purely routine tool supply.

The importance of having a reserve supply of electric power was illustrated recently when the Ipswich (England) Corporation Tramways were shut down for some time owing to the "seizing" of a steam turbine bearing.



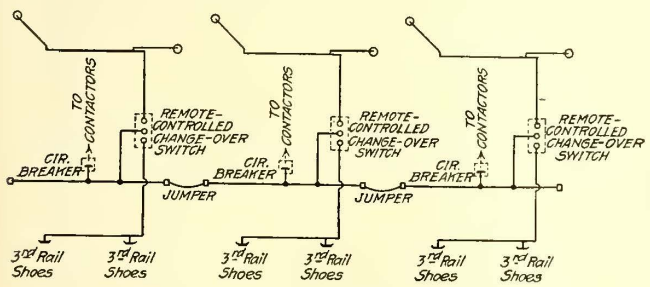
REMODELED CAR IN SERVICE

Making a Suburban Out of a City Car

THE Puget Sound Electric Railway Company is rebuilding nine 56,000-lb. city cars—made available by the introduction of 13,000-lb. safety cars—for short-line (13.45 miles) interurban service to Renton. The rebuilt cars by the addition of H. L. control, Westinghouse radial couplers, sash for all instead of half the car, etc., weigh 62,000 lb. each. The principal dimensions are:

Length over corner posts	38 ft. 9½ in.
Length over bumpers	50 ft. 4 in.
Width over sheathing	9 ft. 1½ in.
Width inside	8 ft. 3½ in.
Truck centers	29 ft.
Truck wheelbase	4 ft. 8½ in.
Height over trolley board	12 ft. 8½ in.

There are two passenger compartments, one with eighteen reversible and four stationary seats, all double; and the second with two reversible and four stationary seats of similar dimensions. Originally part were slat seats and part had rattan coverings. The slat seats and backs were removed entirely while the rattan coverings were replaced with Pantasote.



WIRING DIAGRAM OF POWER CIRCUITS FOR THREE-CAR TRAIN

The gates on the rear platforms were replaced by vestibules and the platform was cut in to make three steps. To carry the reconstructed vestibule, two channel-iron sills were installed back of the bolster, these being tied with a cross-sill

The end doors are only at the head end of a car so that the motorman rides in a cab fully closed at the front to keep out gusts of rain.

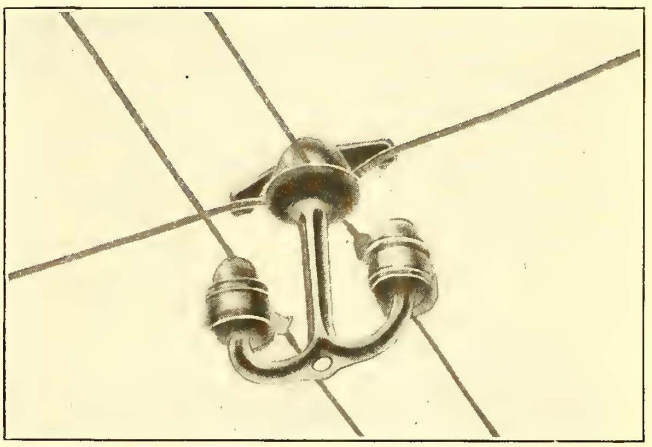
Each car retains its four GE-80 motors except that the gear ratio was changed from 17/69 to 19/67. The air brakes are Westinghouse AMM straight automatic with M22 brake valve. The cars will be run in trains of two to four.

One bus line runs the entire length. When operating from the trolley, the power supply is via one wheel on the first car; but when operating from the third-rail the shoes on every car feed directly into the bus line. As shown in the accompanying wiring diagram the cab of each car contains a remote-controlled changeover switch to meet these conditions.

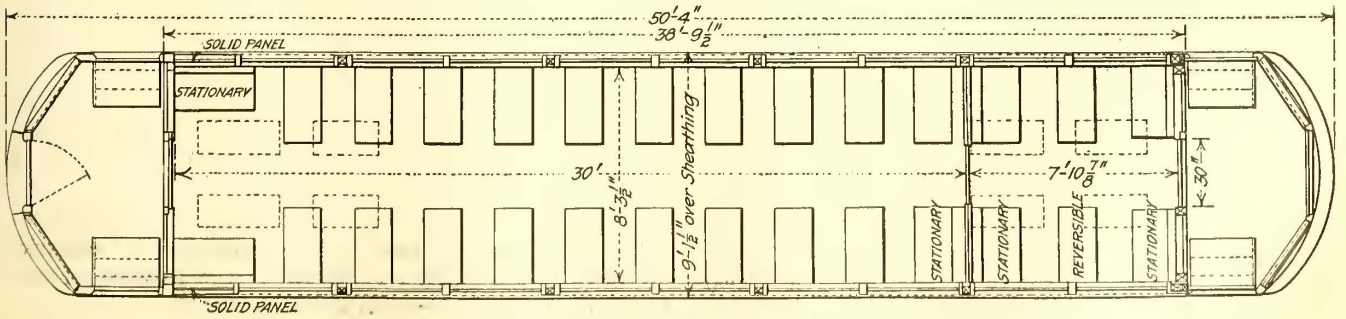
Running Small Wires Along Trolley Lines

By G. H. McKelway
Engineer of Distribution Brooklyn Rapid Transit System

IT OFTEN HAPPENS that in addition to the feeder and trolley wires necessary to operate an electric railway, there are also lighting, telephone or signal wires that have to parallel the tracks. Where spare pins or arms are available, of course, these may be used for supporting the additional wires. Other arrangements consist of attaching the wires to either the poles, to new arms or to the span wires. When these additional wires are carried on the same poles as feeder wires their proper place is below the feeder arms. The reason for this is the much greater liability of the small wires



SPAN WIRE USED TO SUPPORT OTHER WIRES



REBUILT MOTOR COACH OF PUGET SOUND RAILWAY & POWER COMPANY

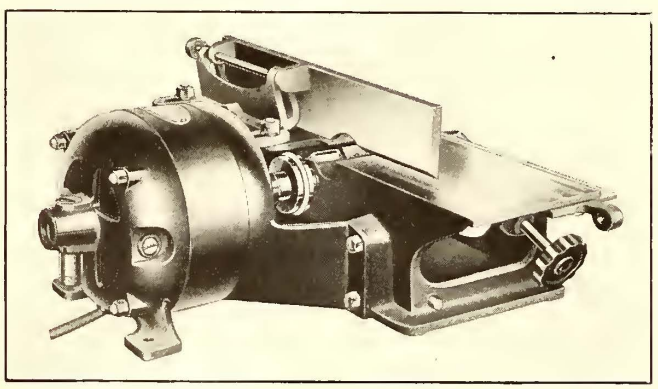
breaking and fouling others than there would be in the case of the feeders.

Where there is not sufficient room on the poles, or when a cheaper type of construction is desired, the wires can be suspended from the span wires. The accompanying illustration shows a method of hanging such wires which has been used on the lines of a large railway system in the East. With this plan the wires are tied to pony glass insulators mounted on ceiling brackets, into which are screwed standard round-top straight-line hangers. The hangers are sprung over the span wires.

While this method is extensively used by the company referred to, yet owing to the number of parts and the comparatively high price of each of them it would appear that an equally satisfactory arrangement would be the often used one of tying circuit breaker porcelains to the spans and passing the light or signal wires through the holes in the porcelain. Such an arrangement is cheaper and the tie wires and insulators, though not so permanent as the hangers, will ordinarily last as long as the spans to which they are attached. The method shown in the picture would be of more value only when all of the material was second-hand and could not be used to advantage elsewhere.

Portable Motor-Operated Bench Planer for Light Operations

A BENCH planer and jointer developed for woodwork operations usually done by hand has recently been placed on the market. The mechanism consists of three knives for an alternating-current equipment and two knives for direct current equipments driven by a small motor through a flexible coupling, the difference being due to the fact that as the direct-current motor can be operated at a higher speed fewer knives are required than for alternating-current operation. The use of such a machine practically eliminates hand planing. It also saves time as the planer is portable and can be taken to the work either in the shops or outside, thus saving the time ordinarily consumed in traveling back and forth to larger stationary jointers. The device was developed by J. D. Wallace & Company, Chicago, Ill., and the motors used are of General Electric construction. These motors are standard equipment and can be furnished for operation on any commercial circuit. The device and motor are a single unit with direct drive.



BENCH PLANER WITH SPECIAL END FLANGE ON PULLEY END

Burning Powdered Coal Successfully

The Additional Equipment Necessary Consists of Crushing and Pulverizing Mills, Driers, Inclosed Storage Bins Together with Conveyors and Elevators

AN EXPERIMENT in the burning of powdered coal was carried out recently by the Puget Sound Traction, Light & Power Company. For this test a 300-hp. B. & W. boiler at the Western Avenue steam heating station in Seattle was equipped with a "Dutch oven." The powdered coal was delivered to an inclosed bunker by bucket elevators. From the bunker the coal was fed by air pressure through pipes, and a locally designed burner to the furnace.

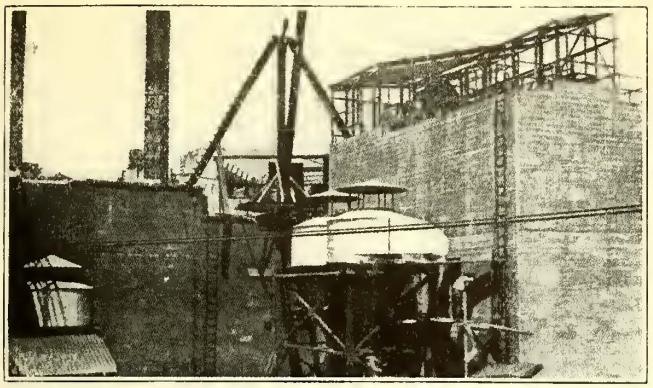
Various difficulties were experienced at first, one of the most annoying being the formation of slag on the boiler tubes. This was due to insufficiency in space between the burners and the tubes, with the result that combustion of the solid matter of the coal was not completed in the firebox, but was still going on among the tubes, the stream of burning coal being from 12 ft. to 14 ft. long. Two means were found for correcting this evil, one by furnishing a longer path for the flame and the other by introducing steam into the fire. The effect of the latter was quite remarkable, resulting in a decrease in flame length of about 50 per cent, the amount of steam required being less than that used for atomization with an oil burner of good design.

With the shortened flame length, the fused portion of the ash is deposited on the furnace walls before reaching the tubes and flows down into the ash pit leaving a glazed coating about $\frac{1}{16}$-in. thick on the brick work. Some difficulty was experienced from accumulation of slag in the ash pit in a solid block which required the use of bars to break up. This difficulty was finally overcome by constructing the throat of the slag pit so that the molten slag was forced to drop from the furnace in semi-fluid masses, and by using a water spray which prevented successive droppings from sticking together. Under this treatment the slag accumulates in the pit in chunks about the size of a large potato and is easily removed with a rake through the usual clean-out door.

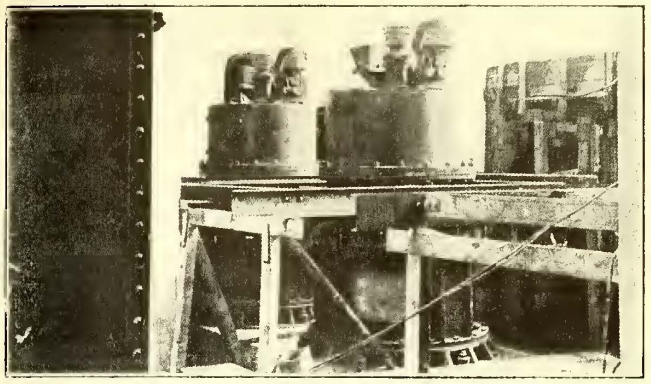
This boiler had previously been used with an oil setting. When fired with oil, it began to show distress at an overload of 50 per cent. With powdered coal as fuel, overloads of more than 100 per cent were carried without visibly affecting either the brickwork or the tubes. Sub-bituminous coals which give an evaporation of about $6\frac{1}{4}$ lb. of water per pound on chain grates gave better than $8\frac{1}{2}$ lb. evaporation per pound of pulverized product when burned in powdered form, corresponding to an increase of 20 per cent to 25 per cent in the evaporative performance of the raw coal.

Almost perfect control of the fire was possible by regulating the speed of the supply fan by means of a rheostat controlling a variable-speed motor. The boiler was equipped with an indicating steam flow meter, and its responses to changes in fan speed were almost like those of an ammeter on an electric generator.

After three months of operation, during which time all obtainable grades of coal were burned, from high-grade bituminous to the purest lignites, it was demonstrated conclusively that coal of the character obtainable in this region could be successfully burned in powdered form under steam boilers. It was shown also that the



CYCLONE DUST COLLECTOR—FRAME OF HOUSING FOR BELT CONVEYOR BEING ERECTED ON TOP OF CRUSHED COAL BUNKER



TWO OF THE PULVERIZING MILLS UNDER ERECTION. STEPPED CONE PULLEYS ARE FOR SCREW FEED—DRIVE PULLEYS CAN BE SEEN AT BASE

performance of all grades when burned in this way was superior to any other method of firing, the improvements in the case of the lower grades being relatively greater than for bituminous coal.

As a result of these experiments, it was decided to equip the entire Western Avenue plant for burning powdered coal. As the station was equipped for burning oil, it was necessary to provide coal and ash-handling equipment and storage facilities and to change the furnace design as well as to supply the equipment required for drying and pulverizing the coal.

The pulverizing plant will be housed in a new concrete building adjacent to the station. Coal will be delivered from the bunkers and fed by gravity onto a rubber belt conveyor which will carry it to a crusher of the single-roll type. This belt will deliver the coal to a vertical elevator of the two-strand chain and bucket type just inside the pulverizing plant. After being crushed the coal will be raised to the roof and distributed to the crushed coal bunker by flight conveyor.

The crushed coal bunker will extend the width of the building and have a capacity of 300 tons. From two openings in the bottom of this bunker the coal will be fed by apron-type feeders to chutes communicating with the driers on the floor below. The spill from the apron feeders will be picked up by screw conveyors and delivered to the chutes, which are to be so arranged that coal can be fed from either end of the bunkers to either of the two driers.

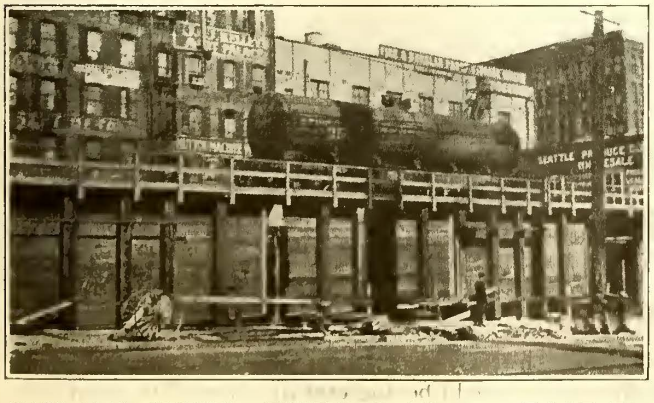
The driers will consist of two steel cylinders, 55 ft. long, one 5 ft. and the other 6 ft. in diameter. They will be slightly inclined to the horizontal and arranged for rotation about the longitudinal axis. Steel baffles will be arranged longitudinally inside which will successively raise the coal and drop it as the cylinder rotates, thus forcing the coal, because of the pitch, gradually to pass through the drier.

Heat for drying will be supplied by furnaces which will inclose the driers for the greater part of their length. The furnaces will be fired with powdered coal and the gases of combustion will pass into the driers at the discharge ends and be sucked through the shell, together with the moisture and dust from the coal, by fans at the opposite ends. These fans will discharge into cyclone dust collectors installed on the roof.

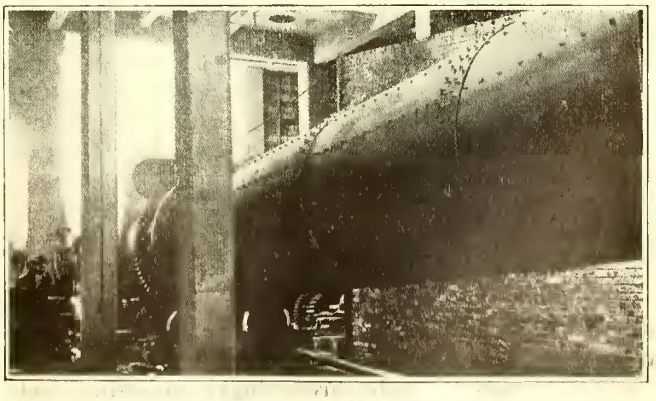
After drying, the powdered coal will be delivered to the dry-coal bunker on the roof by means of a bucket elevator. From the dry-coal bunker the coal will feed through chutes to four pulverizing mills, built by the Fuller Engineering Company. These will grind the dry coal to a fineness permitting 95 per cent to pass a 100-mesh screen and 85 per cent to pass a 200-mesh screen. The powdered coal will be carried from these mills by screw conveyor to the north side of the building, raised to the roof by bucket elevators and distributed by screw conveyors to steel bins in the boiler plant.

The powdered coal will be taken from the bottom of the steel storage bins by short screw conveyors driven by variable-speed motors and delivered into down pipes communicating with the burners. The passage of the coal through the down pipes is facilitated by air.

Dutch ovens have been constructed in front of each boiler and the floor cut away to provide the necessary furnace volume and slag pits. The clean-cut doors for the slag pits are at the basement floor level under the boiler room, and slag will be handled in wheelborrows



RAW COAL BUNKERS EXTEND BELOW STREET LEVEL WITH BELT CONVEYOR BENEATH THEM



DRIER BEFORE PLACING BRICKWORK, WITH DRIER FURNACE IN BACKGROUND

to a bucket elevator which will raise it to the top of a concrete ash bunker. This bunker is arranged to discharge into railroad cars or auto trucks.

Further details of this installation are given in an article by G. E. Quinman in the July issue of the *Puget Sound Electric Journal.*

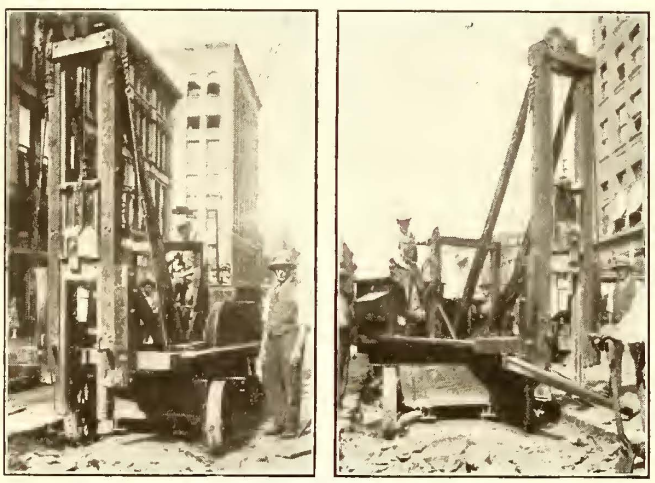
Cutting Paving Foundation with a Drop Hammer

BY HARLEY KIMMEL
Engineering Department, Des Moines (Iowa) City Railway

DURING the summer of 1918, the Des Moines (Iowa) City Railway was confronted with the task of relaying 4500 ft. of track. This work was all on paved streets with pavement laid on a thick concrete base in which the ties were imbedded.

Changes in track construction necessitated the removal of this old concrete base which ranged in thickness from 8 in. to 14 in. and was of an excellent quality in most places. Various methods of removing this were tried, none of which were at all satisfactory until the following device solved the problem.

An ordinary back filling machine, such as is used for filling trenches left in sewer construction, was made



DROP HAMMER BREAKING UP CONCRETE

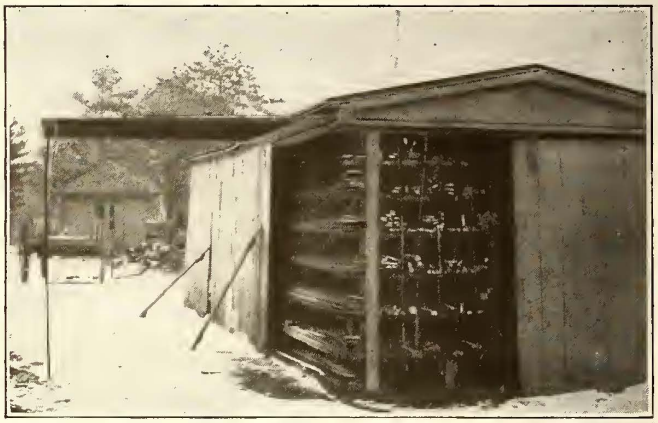
use of. The frame of this was raised above the wheels and upon this raised frame the mechanism was placed. 6-in. x 8-in. x 12-ft. leads with 1⅝-in. x 4-in. channel iron mortised on their inner edges were erected, and an 800-lb. common drop hammer with a 4½-in. x 2-ft. steel chisel clamped to its bottom was arranged to slide in these leads. Power for operating was furnished by a 15-hp. 825-r.p.m., 550-volt compound-wound d.c. motor. Current was taken from the trolley wire.

An eight-tooth No. 87 sprocket on the shaft of the motor drives a twenty-nine-tooth sprocket on the hoisting drum through a No. 88 steel roller chain. The hammer is operated through a ⅝-in. steel cable which runs from the drum under a 12-in. sheave bolted to the frame and over a similar sheave at the top.

The crusher is drawn by horses and a 12-ft. handle clamped to the end of the frame and at right angles with the leads acts as a lever with which to swing the mechanism from one side of the track bed to the other. The accompanying illustration gives an idea of the construction of the machine.

Getting the Most Out of the Iron Storehouse

AT THE Salem (N. H.) shops of the Massachusetts Northeastern Street Railway bar iron for the forge shop is stored in an outdoor rack structure provided with a sectional housing, as shown in the accompanying illustration. Double sliding front doors are a conveni-

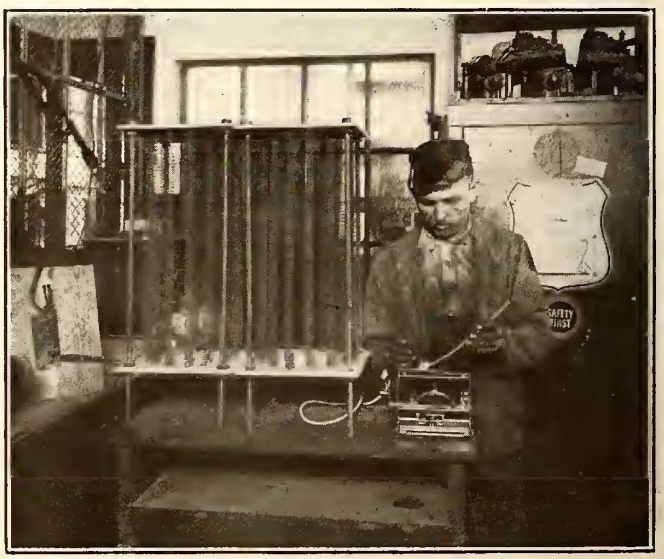


IRON STOREHOUSE OPEN AT BOTH SIDE AND END

ent feature, but the handiest feature in the design is the provision of folding side doors. These are in three sections and can be easily raised and lowered by one man, and fastened open by a vertical rod connection. This arrangement enables the rods or bar iron stored at the side of the rack to be handled with maximum speed.

A Welding and Battery-Charging Set from Heater Coils

J. L. BROWN, master mechanic, Dallas (Tex.) Railway, recently constructed the welding rheostat and charging set shown in the accompanying illustration. The material used was largely some coils from old electric heaters and some pieces of transite board. There are two groups of twelve coils each, giving 10 amp. in multiple and 5 amp. in series. The outfit is used for light welding jobs and for charging automobile 6-volt storage batteries.



WELDING RHEOSTAT AND BATTERY CHARGING SET

Block Signals Immune to Lamp Failures

Special Arrangements for Counting In and Out Also Provide for the Proper Distribution of Traffic

By W. C. Wefel
Light Foreman Denver (Col.) Tramway

A SET of 550-volt automatic block signals has recently been constructed in the shops of the Denver Tramway, and installed on one of the lines of this company. A careful investigation of available records indicates that 50 per cent of signal failures are lamp failures, and special attention has been given to an elimination of this trouble. In doing this we are using for lighting the signals 80 per cent of the current consumed, rather than 20 per cent or 40 per cent, as in some signals.

The signal shown in Fig. 1 has two circuits, each one consisting of four 115-volt bow-tungsten lamps, and one 250-ohm resistance coil. The lamps, as well as the coil, are provided with automatic shunts, and in case of the failure of any lamp or coil, it is at once recorded by compensating lamps, while one good lamp still remains behind the colored lens. The compensating lamps are placed in a separate compartment, and are visible through a long, narrow strip of frosted glass, underneath the colored lenses. Motormen have been requested to report to the dispatcher at once the appearance of a white light, as this indicates a lamp failure and the need of attention. The maintenance men can then pick out the bad lamp without molesting any other, which is not the case without the compensating feature. From a lighting standpoint a complete failure of the signal would never take place, for even if both lamps behind the colored lens should fail the white light would indicate trouble and cause the motorman to seek instructions or proceed with caution. Both red and green lenses are 5⅜ in. in diameter, hooded, and they can be seen on both sides of the signal very distinctly night or day.

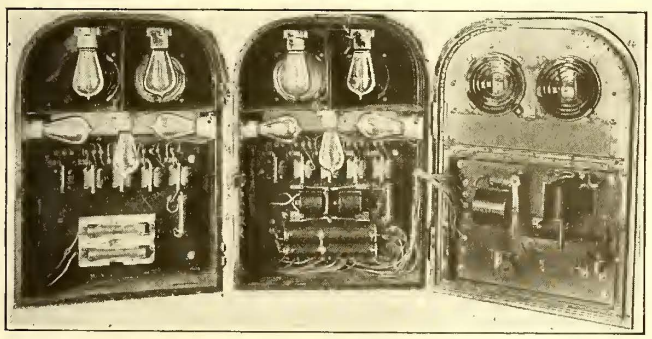


FIG. 1—AUTOMATIC BLOCK SIGNAL WITH COMPENSATING FEATURE TO NEUTRALIZE LAMP FAILURES

The installation now in service did not require the counting in and out system. Whenever traffic conditions demand it this signal will, however, take care of this feature with a slight change in the mechanism. The tendency of cars going in one direction to hold those going in the opposite direction will also be done away with. This is accomplished by providing a means whereby the car that is waiting for the occupied block to clear can, by standing with its trolley wheel on the contact, change the green signal on the counting-in or clear end of the block to red, and keep any other cars from following those already in the block. The signal on the end at which the car is waiting remains in the stop or red position until the block is clear, and all cars are counted out. For a fraction of a second the signals are restored to normal or clear, and the car waiting with its trolley wheel on the contact pan at once sets the signal on that end to green and on the distant end to red. This will provide for a more equal movement of cars in both directions, and avoid delay to a car on time by those that are late. The possibility of burning up the magnet coils by leaving the trolley wheel on the contact pan has also been removed by providing two paths for the magnet current; one straight across the line and the other shunted around a 2000-ohm resistance coil. As soon as the operation of the magnet has been completed, the former path is broken and the shunted circuit takes care of the current flowing through the resistance coil and magnet. This avoids a rebound of the selective switch and keeps the flow of current very small through the magnet. Accessibility of all parts has received consideration. Any part of the signal can be removed without disturbing any other, and all wires entering the signal are fused and are in a separate box. The magnet coils are wound to perform their function with a line potential as low as 300 volts. The signal containing the operating mechanism weighs about 50 lb. and the other 30 lb. They are attached to the pole with L-shaped brackets as shown in Fig. 2, and can be adjusted to allow for the rake in the pole.

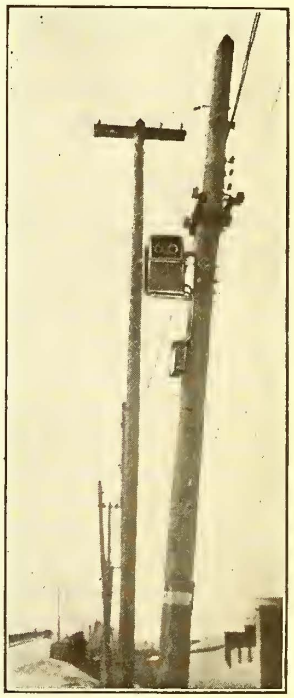


FIG. 2—NEW 500-VOLT SIGNAL MADE BY DENVER TRAMWAY

Women Substation Operators at Cleveland

For some time past the Cleveland (Ohio) Railway has been employing women in substation operation with entire success. At present twelve are engaged in this work out of a total of twenty-four operators. The experience of the company has shown that women have certain qualities which are particularly essential in this work. They have a keen sense of responsibility and are very reliable in the performance of their duties. They are somewhat slower in switching operations, partly due to this conscientiousness and partly to inexperience. For example, when there is trouble which by rapid switching might be taken care of, the women are apt to let an entire station go out before starting up again. A skillful man might be able, in such a case, to get the equipment back onto the source of power without losing the momentum of the station and thus insure minimum loss of direct current power supply.

LETTERS TO THE EDITORS

Public Ownership Should Not Be Suppressed

NORTH AMERICAN COMPANY
NEW YORK CITY, Nov. 25, 1918.

To the Editors:

The arguments urged against public ownership at this time may be summarized as follows:

1. Public ownership would prove inefficient in practice and cause an increase in fares or support by taxation;

2. We should give regulation a good tryout before swapping horses;

3. Public ownership is the cry of despair;

4. The railways need a new relationship with the communities they serve;

5. Because municipal ownership is reported to have invariably proved a failure, we should not capitulate to the prejudices of the hour;

6. An aroused public opinion will sooner or later accord the railways substantial justice.

Speaking generally, the representatives of the electric railway industry who contributed their views on the public ownership resolution have voiced their opposition to this kind of ownership. I have little doubt but that it represents their mature views in the light of such analysis as they were able to give to the subject. Their unwillingness to permit the public to pay the high costs of public ownership is convincing proof of their deep interest in the public welfare. There is not one statement into which can be easily read the thought that opposition to public ownership results from individual selfish interest. Through practically the entire discussion runs an evident deep interest in the common people and taxpayers, a belief in their ultimate fairness, and an optimism as deep-seated as the deficits from which the industry pretty generally has been suffering for some time past.

I must confess that in advocating public ownership I am prompted by selfish motives. I am not a statesman, and I have no right to tell the people what is for their own best interests. Even if I did, I doubt if the general public would believe me any more than it seems to believe what other public utility operators say. I recognize that we live in a democracy. The people are sooner or later going to have what they want. A desire to have often comes from a belief that it is difficult of attainment. Once attained or possessed of the knowledge that it can be had, the desire for possession is often removed.

In introducing a resolution favoring the facilitating of public ownership, I had no hope that it would be promptly adopted by the American Electric Railway Association. A policy involving so important a change in the industry cannot be passed upon over night. I wished to call the attention of electric railways to this important question, knowing that they would be required to meet it sooner or later in their dealings with the communities they serve. The industry will never settle its pressing problems until it has reconciled itself to the idea of public ownership and is prepared to welcome it as one of the important elements in any settlement or enabling legislation. The ease of settlement will likely vary in fairly direct proportion to the facility with which public ownership is provided for. This is not the occasion to push my views further or give the other reasons for advocating legislation looking toward public ownership (not necessarily municipal), which were not contained in the draft of the resolution.

It is not the duty of any individual to point out to the industry what it should do. I trusted that we needed only the suggestion of an idea and that the brains which we generally admit we are endowed with would do the rest. A review of the written opinions shows how far the idea made progress.

J. D. MORTIMER, President.

Municipal Ownership Not the Solution

WASHINGTON RAILWAY & ELECTRIC COMPANY
WASHINGTON, D. C., Nov. 26, 1918.

To the Editors:

The American Electric Railway Association has heretofore been opposed to municipal ownership, and while it is true that the industry is now confronted with unprecedented difficulties, I for one am not of the opinion that the solution of those difficulties lies in municipal ownership, nor do I feel that the association is justified in taking any action in that direction. Our backs may be to the wall, but it seems to me there is a greater realization on the part of the public and of the regulatory bodies of the necessities of the situation than there has been at any time in the past, and I believe that with a return to normal conditions the outlook for the industry is far from hopeless.

WILLIAM F. HAM, President.

Menaces Should Be Removed

Such Is the Finding of the Committee on Public Service Securities of the Investment Bankers Association

THE electric railway situation is reviewed at length in an interim report just issued by the committee on public service securities of the Investment Bankers Association of America. The report outlines at length how communities would be benefited by a removal of the menaces that now frighten investors away from the electric railway field.

In the committee's opinion, there will undoubtedly have to be increases in rates, but relief can also be given by the reduction of certain expenses, such as paving and special taxes. Continuing, the report says:

There seems little question that in keeping down the rates and improving the service of public utilities there is nothing the public and its representatives can do that will be so effective as the removal of menaces to the business. Menace in itself is a cost of the service. Uncertainty as to results, fear of illogical burdens, lack of freedom in handling the business in a business-like way, indefinite fear of attack—all are costly because the objects feared are certain to be insured against in the rate of return that investors consider adequate. Where risks appear great, insurance premiums are great.

There are well-grounded objections to the guarantee of income returns by city and state governments, but if city and state governments were to recognize clearly the quasi-public nature of utilities and were to protect jealously the security of the investments in them; if they were to show through a period of years that unreasonable burdens would not be imposed, and that capital devoted to a public use and irrevocably placed at the mercy of the public would be kept inviolate, then there would be almost the equivalent of a guarantee based on custom and the practice of fair dealing. An investment banker does not need to be told that under these conditions capital would be invested in

the utility business at considerably lower rates of return than the rates that have been necessary to attract it heretofore.

One of the most serious of the menaces that the investor fears is that in arriving at a capital base for regulation or purchase, the value of the property will not be recognized, and that unreasonable standards will be applied in valuation. The community that fancies it has made a profit for its people by forcing the acceptance of under-valuation as a capital base for its utilities makes its first loss in the higher rate of return necessary to attract new capital into a community that has proved that capital has something to fear. This higher rate of return applies to all the new capital needs of the future. The effect is shown not only in the larger proportion of any receipts from new business that must go to new capital, but is shown also in the slower contribution of capital because there will be less business to be taken on that will yield the larger returns. The service to the community is restricted. If communities were to consider valuations not with the idea of squeezing them to the minimum but with the idea of doing full justice to the owners, we should soon have investors considering utility investments in a new light.

AMERICAN ASSOCIATION NEWS

More War Labor Board Awards

THE Electric Railway War Board has issued Bulletin No. 39, giving details of awards made by the National War Labor Board, affecting electric railways, on Nov. 20 and 21. The bulletin was dated Nov. 25. The awards affect the following: Portland Railway, Light & Power Company, Butte Electric Railway, Denver Tramway, Charleston Consolidated Railway & Lighting Company, Cincinnati Traction Company, Cumberland County Power & Light Company, Empire State Railroad Corporation, Lewiston, Augusta & Waterville Street Railway, East St. Louis, Columbia & Waterloo Railway, Syracuse & Suburban Railroad, Syracuse & Northern Electric Railway, Auburn & Syracuse Electric Railroad, Detroit United Railway and Rochester & Syracuse Railroad. A list of previous bulletins issued by the War Board will be found in the issue of this paper for Nov. 16, page 895.

Simplifying the Automatic Substation Circuit Diagram

AS WAS mentioned briefly in the issue of the ELECTRIC RAILWAY JOURNAL for Nov. 9, a feature of the Nov. 5 meeting of the Elevated Railroads company section at Chicago was a talk by Charles H. Jones on the history and principles of operation of the automatic substation. Mr. Jones gave the members the benefit of his experience with the four substations on the line of the Chicago, North Shore & Milwaukee Railroad.

In his talk Mr. Jones made a special and successful effort so to simplify the wiring diagram of the "automatic" that the essentials of its operation would be clear to men without electrical engineering experience. For this purpose he showed numerous pictures and also the diagrams reproduced herewith. These are almost self-explanatory. Fig. 1 was used to give the men a clear understanding of the primary pieces of apparatus in an ordinary manually-controlled substation, while Fig. 2 had a similar purpose with respect to the "automatic." The combination of these two showed in a simple manner the difference between the two. Fig. 3 was used in explaining the sequence of operations in putting an automatically-controlled substation on the line, after the control equipment had been set in motion by the contact-making voltmeter.

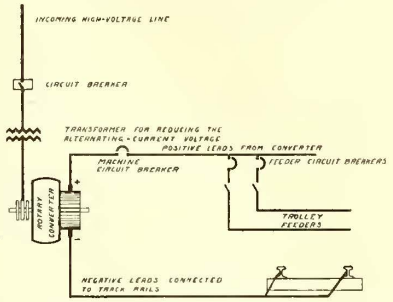


FIG. 1—SIMPLIFIED CIRCUIT DIAGRAM FOR MANUALLY CONTROLLED SUBSTATION

These operations, as explained by Mr. Jones, were as follows:

First, oil switch closed.

Second, rotary converter closed on the starting taps of the transformer.

Third, shunt field of the rotary connected across the exciter set.

Fourth, shunt field thrown across the rotary leads.

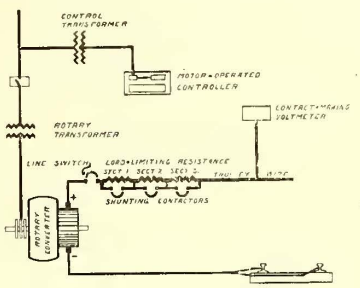


FIG. 2—SIMPLIFIED DIAGRAM FOR AUTOMATIC SUBSTATION

Fifth, rotary connected to the full-voltage taps of the transformers.

Sixth, connection made from the positive lead of the rotary to the controller for furnishing current to operate the direct-current contactors.

Seventh, main contactor closed.

Eighth, ninth, tenth, shunting contactors closed in sequence, thereby putting the rotary on line with all resistance cut out.

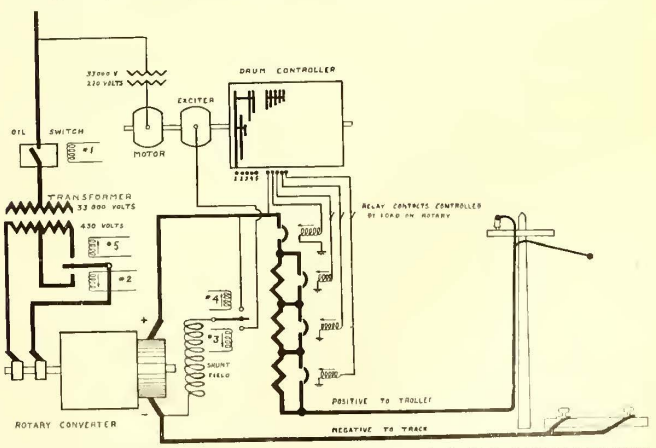


FIG. 3—DIAGRAM SHOWING SEQUENCE OF OPERATIONS IN AUTOMATIC SUBSTATION

The relay contacts are indicated in the circuits of the shunting contactors. These contacts are controlled by the load on the rotary.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

Minneapolis Facing Problem

Can Accept Present Inadequate Service, Permit Fare Increase or Apply Municipal Ownership

Horace Lowry, president of the Minneapolis (Minn.) Street Railway, included in the system of the Twin City Rapid Transit Company, answering a question put to him by Alderman J. D. Williams at a Council committee meeting on Nov. 20, admitted that three courses of action were all that were left to the city in dealing with the railway. In short, the city could accept the present service until financial conditions improved, it could permit an increase in fares with improved service or it could apply municipal ownership.

COMPANY AT END OF ROPE

Mr. Lowry intimated that the company had come to the end of its rope. In the matter of increasing fares, he said, the Legislature could be asked to provide for joint control of the Minneapolis and St. Paul properties of the company and authorize the body so controlling them to regulate fares.

The meeting of the Council committee on street railway matters at which the affairs of the railway came up had been called to determine what legal means could be taken to compel better service in Minneapolis. It had been suggested that the city attorney bring mandamus proceedings to compel better service. After the Aldermen had discussed the situation, Mr. Lowry was asked to make a statement. He said:

"The city can be constructive and take some action looking to increased revenues for the company, thereby permitting us to provide more adequate service, or it can be destructive and force us to go into the hands of a receiver. Other cities throughout the country are permitting their railways to increase their fares, and if that could be done here we could maintain the service demanded. Minneapolis right now is maintaining better service on a 5-cent fare basis than is given in any other city of the country. We cannot do more than we are doing."

COMMITTEE WILL REPORT

Alderman Williams asked Mr. Lowry if he thought it possible to increase fares in Minneapolis when, under present conditions, it was practically impossible to increase fares in St. Paul without a referendum vote. Mr. Lowry said:

"I do not think that could be done. The Legislature could be asked, however, to provide for control of the two properties under one body, with that particular body given power to regulate rates."

The city street railway inspector, the city attorney and the special committee of five Aldermen will report back findings on the adequacy or inadequacy of the service and remedies, if necessary, within two weeks.

Preparing for Grand Jury Action

The Kings County Grand Jury began an investigation on Nov. 25 of the wreck of a Brighton Beach train of the Brooklyn (N. Y.) Rapid Transit Company in the Malbone Avenue tunnel on Nov. 1 which cost almost 100 lives.

This investigation of the Grand Jury is entirely separate from the "John Doe" proceedings in which Mayor Hylan is sitting as a magistrate, and in which Edward Luciano, the strike-breaker motorman who drove the wrecked train, is one of the defendants. At the conclusion of this hearing it is believed that Mayor Hylan will issue warrants.

It is not likely that the Grand Jury will hear additional evidence for several days as the entire staff of District Attorney Lewis's office is to devote its attention to getting the hearing before Mayor Hylan into its final stages.

Among those subpœnaed to appear on Nov. 25 at the Hylan hearing was Vice-President John J. Dempsey, the operating head of the Brooklyn Rapid Transit Company, and his immediate subordinate, Division Superintendent Thomas F. Blewett. They declined to sign waivers of immunity, and Mr. Lewis said that they would not be allowed to testify without signing such waivers.

Nicholas F. Brady, chairman of the board of directors of the Brooklyn Rapid Transit Company, was called as a witness on Nov. 26 before the Mayor. Mr. Brady said that on Oct. 29 the recommendations of the War Labor Board were received. On the Monday previous the matter had been discussed by the executive committee of the company and it was agreed to leave the carrying out of the program to the officers rather than to the board of directors. The policy was for the carrying out of the recommendations of the War Labor Board, with the exception of the cases of one or two men who they had decided ought not to be taken back for the good of the company. Mr. Brady said the question of carrying out the recommendations was left to Timothy L. Williams as president of the Brooklyn Rapid Transit Company, and the case of the New York Consolidated Railways to Mr. Dempsey. Mr. Blewett, division superintendent, was under Mr. Dempsey.

Columbus Franchise Bid

New Factors Regarded as Complicating the Columbus Railway Settlement Matter Still Further

A surprise was caused in the City Council of Columbus, Ohio, during the week ended Nov. 23 when Attorney J. W. Heintzman of Cincinnati appeared on the floor as the representative of a new company which desires to bid for a franchise in that city. He refused to say at that time what interests he represents, but did state that no company would accept the same franchise terms as are now in force.

TEMPORARY FARE ADVANCE ADVOCATED

Councilman Weinland offered an ordinance providing for a temporary rate of six tickets for a quarter, with a 20 per cent increase in the service and extra cars for rush hours, but this was defeated. Mr. Weinland says that the present rate of fare has produced a deficit and there is danger of suspension of service. He wanted measures adopted that would bridge the chasm until some definite arrangement could be made on the basis of the investigation which is under way. His idea is that a service-at-cost plan, such as is used in Cleveland, would fit conditions in Columbus.

President Westlake of the City Council has announced that he will introduce an ordinance requiring all city and interurban cars which carry local passengers to stop at the corporation lines, in addition to other stops for which provision has already been made. This will allow people who have paid the city fare to alight and walk the remainder of the distance, instead of paying the 5-cent fare, to which the company is entitled by its franchises. It is only another phase of the fight to prevent the company from collecting the 5-cent rate, which it did not do until forced to by present conditions.

COMPANY CURTAILS SERVICE

The company began to curtail service on the morning of Nov. 20, in accordance with the notice already served by Vice-President Pomerene, and the cut was a noticeable one. The heaviest curtailment is to be made on the lines where the greatest number of people refuse to pay the 5-cent cash fare inside the city. Some lines are good at one end in this respect and bad at the other.

Edward W. Bemis, representing the city of Columbus, Ohio, has notified the City Council of the employment of Sangster & Matthews, accountants, to aid in the investigation of the books of the Columbus Railway, Power & Light Company.

Seven Wage Awards Announced

War Labor Board in Each Case Urges Necessity of Reconsidering Question of Fare Relief

The Committee on Public Information has just released, under dates ranging from Nov. 21 to Nov. 23, the text of seven electric railway wage awards of the National War Labor Board. The wages on three interurban lines are fixed at from 41 to 45 cents an hour, with rates of from 38 to 42 cents on another line of this sort. The rates in Charleston, S. C., run from 36 to 40 cents, while in the special cases of the Portland (Ore.) interurban lines and the system in Butte, Mont., they run from 47 to 60 cents and from 61 to 65 cents.

In several awards where the wage rates of employees other than motormen and conductors were involved, the board held that the percentage increase granted to motormen and conductors should be applied to these other rates, but that the latter should in any event be raised to a minimum of 42 or 42½ cents an hour up to ten hours of work. On the other hand, the new rates for such other employees must not exceed this minimum or operate to increase wages of any employees who are already receiving union-craft rates.

In every case the board stated that the award would add substantially to the operating cost of the railway and would require a reconsideration by the proper authorities of the fare question. The board repeated its early urgent recommendation of the Cleveland decision for some action to meet the pressing need of the carriers.

Abstracts of the various awards follow:

CHARLESTON (S. C.) CONSOLIDATED RAILWAY & LIGHTING COMPANY

New Wage Scale for Motormen and Conductors: First three months, 36 cents an hour; next nine months, 38 cents an hour, and thereafter, 40 cents an hour.

Time of Award: Effective as of Nov. 16, for the duration of the war, with opportunity for reopening of case at six months' intervals. The company has until Dec. 15 to make back payments.

SYRACUSE (N. Y.) NORTHERN ELECTRIC RAILWAY

New Wage Scale for Motormen and Conductors: First three months, 41 cents an hour; next nine months, 43 cents an hour, and thereafter, 45 cents an hour.

New Wages of Other Employees: The wages of employees (other than motormen and conductors) which have been submitted to the board of fixation shall be increased by the same percentage that the maximum of the wage scale paid to motormen and conductors is increased by this award; provided, however, that if this increase does not bring the wage of any adult male employee up to a minimum of 42 cents an hour he shall be paid this minimum up to not more than ten hours work a day. Where women are employed in the same classification as men, they shall be paid equal pay for equal work. The foregoing provisions shall not apply to employees who already are receiving union-craft rates, or operate so as to increase their wages beyond such rates.

Time of Award: Effective as of Aug. 2, for the duration of the war, with opportunity for reopening of case at six months' intervals. The company has until Feb. 1 to make back payments.

BUTTE (MONT.) ELECTRIC RAILWAY

New Wages for Motormen and Conductors: First three months, 61 cents an hour; next nine months, 63 cents an hour, and thereafter, 65 cents an hour.

Time of Award: Effective as of Aug. 3, for the duration of the war, with opportunity for reopening of case at six months' intervals. The company has until Feb. 1 to make back payments.

PORTLAND (ORE.) RAILWAY, LIGHT & POWER COMPANY

New Wages for Interurban Employees: Flat rates as follows—(a) passenger trainmen, 54 cents an hour; (b) freight trainmen (express, local freight and day yard crews), 56 cents an hour; freight trainmen (night yard crews) 60 cents an hour; (c) passenger and freight brakemen, 47 cents an hour; day yard crews, 59 cents an hour, and night yard crews, 60 cents an hour.

Working Conditions: All motormen and conductors who are called upon to work extra trips or do other extra work or tripper service in addition to the runs to which they are respectively assigned shall be paid time and a half for all such time, where such extra work requires their employment for more than ten hours a day. No motorman or conductor, however, who is regularly assigned to a scheduled run paying more than eight hours platform time shall be required to run any such extra trip or do extra work or tripper service unless there are no available extra men to do such work. With regard to fixing the time within which a day's work shall be completed, the request of the complainants that the eight-hour day be completed within ten consecutive hours is not granted.

Time of Award: Effective as of July 17. The company has until Feb. 1 to make back payments.

CINCINNATI & COLUMBUS (OHIO) TRACTION COMPANY

New Wage Scale for Motormen and Conductors: First three months, 41 cents an hour; next nine months, 43 cents an hour, and thereafter, 45 cents an hour.

New Wages of Other Employees: The wages of employees (other than motormen and conductors) which have been submitted to the board for fixation shall be increased by the same percentage that the maximum of the wage scale paid to motormen and conductors is increased by this award; provided, however, that if this increase does not bring the wage of any adult male employee up to a minimum of 42 cents an hour, he shall receive this minimum up to not more than ten hours work a day. The foregoing provisions shall not apply to employees who already are receiving union-craft rates, or operate so as to increase their wages beyond such rates.

Time of Award: Effective as of Nov. 22, for the duration of the war, with opportunity for reopening of case at six months' intervals.

CINCINNATI, MILFORD & LOVELAND (OHIO) TRACTION COMPANY

New Wages of Motormen and Conductors: First three months, 38 cents an hour; next nine months, 40 cents an hour, and thereafter, 42 cents an hour.

New Wages for Other Employees: Same as in case of Cincinnati & Columbus Traction Company, except that the minimum rate is set at 42 cents an hour.

Time of Award: Effective as of Sept. 1, for the duration of the war, with opportunity for reopening of case at six months' intervals. The company has until Feb. 1 to make back payments.

CINCINNATI, LAWRENCEBURG & AURORA (OHIO) ELEC. ST. R.R.

New Wages for Motormen and Conductors: First three months, 41 cents an hour; next nine months, 43 cents an hour, and thereafter, 45 cents an hour.

Time of Award: Effective as of Nov. 22, for the duration of the war, with opportunity for reopening of case at six months' intervals.

The text of the nine additional awards mentioned very briefly in the ELECTRIC RAILWAY JOURNAL of Nov. 23, page 934, will be published in the issue of this paper for Dec. 7.

Springfield Wage Complaint Made

Officials of the union, acting for the employees of the Springfield (Mass.) Street Railway have requested the War Labor Board to act in behalf of the men's demands for a wage increase of approximately 40 per cent. This request, in the form of a complaint, has been dispatched to Washington and follows the meeting of the men at which consideration was given to the company's refusal to consider the demands.

This is the latest step in a long controversary that has been brewing since the award of Henry B. Endicott last June under which the men are now employed. A grievance was claimed by the company's failure to "adjust" wages to correspond to those paid for similar work by the Worcester Consolidated Street Railway. The war was then in progress and the Springfield Street Railway averted a threatening situation by granting an increase of 4 cents an hour for miscellaneous employees.

Labor Board Decides Two Minneapolis Cases

Discrimination Against Employees for Union Affiliations Considered—Won't Act In Twin City Case

On Nov. 23 the National War Labor Board handed down a decision involving its jurisdiction where a State arbitration board had enunciated principles different from those of the federal board. The same decision covered two cases, those of the International Association of Machinists of the city of Minneapolis against the Minneapolis Steel & Machinery Company and of various employees against the Twin City Rapid Transit Company.

UNION DISCRIMINATION CHARGED

In the case of the Minneapolis Steel & Machinery Company several employees complained that they had been discharged for joining the union, and one of the defenses of the company was that under the rules of the Minnesota Board of Arbitration, a branch of the State Public Safety Commission, employers who before the war had refused to employ or continue in their employment any member of a trade union, need not change their practice. This is not in accord with the rules of the National War Labor Board, which provides that there shall be no interference by employers with the right of their employees to join labor unions. In other respects the principles of the two boards differ but little.

The manufacturers claimed that the federal board should not take jurisdiction because the case was properly within the cognizance of the State Board of Arbitration, but the War Labor Board held that there could be concurrent jurisdiction, even where different rules prevail, as in this case in regard to labor unions, and that until the ratification of the treaty of peace, the federal authority, as it related to war preparation, should be supreme. The board adds, however, that its principles, when they are at variance with those announced by a state board, do not necessarily nullify such rules. Such a question, it says, can well be postponed until it arises on the merits of the case, but it does not see in this dif-

ference any reason for ousting the jurisdiction of the federal board, so that the evidence will be heard.

In the street railway case, the board says, a different situation exists. The company made two pleas, one that a method of settlement existed through "shop mediation" through committees, with ultimate reference to the president of the company. The other was that the Public Safety Commission (the State arbitration board) had already begun to consider the controversy. The National War Labor Board declined to accept the first plea as describing a satisfactory method of arbitration, as outlined in its general principles, but accepted the second plea, in view of the fact that the hearings had begun. Incidentally the national body remarks:

"We are relieved in this particular case, so far as the plea is concerned, from any conflict as to a denial of rights to organize in a trade union by the street railroad companies in the decision of the Public Safety Commission itself, enjoining the street railroad company from discrimination on account of union activities."

Service at Cost Will Stay

Delos F. Wilcox, former franchise expert to the Public Service Commission of the First District of New York and the author of a two-volume review of public utility franchise settlement terms, was one of the speakers at the reconstruction congress held recently by the National Municipal League at Rochester, N. Y. Dr. Wilcox is now associated with the United States Bureau of Standards for the purpose of making a study of the standardization of street railway franchises and related matters, but prefaced his remarks by the statement that the views expressed in the paper were personal. He remarked that the present crisis in electric railway affairs was precipitated by the war, but that its origin lies in over capitalization. Briefly, he advocated these reforms:

1. The speculative element in electric railway investments must be removed and the public must get the benefit and bear the burden of service at cost.

2. Electric railway service must be rendered at cost.

3. Power to fix wages and working conditions will have to be conferred on the same public bodies vested with power to fix rates. Strikes on electric railways will have to be outlawed.

Dr. Wilcox pointed out that New York City's dual subway contracts provide that the city defers interest on its own investment until the operating companies have been assured of operating expenses and a fixed return on their capital; in other words, he added, New York thought the uniform 5-cent fare important enough to subsidize it.

Dr. Wilcox believes the New York, rather than the Boston plan, will prevail on the ground that local transit will be recognized more and more as a public function for the general convenience of the people.

New Electric Railway Association

Operators in Trans-Mississippi Territory Organize for Closer Co-operation Through Exchange of Views

Electric railway operators of six States west of the Mississippi River met in Omaha on Nov. 23 to exchange views on present conditions, prospects and courses of action. As a result the Trans-Mississippi Electric Railways Association has been formed to include representatives of companies operating in communities of more than 50,000 population, and one representative from each state association, in Missouri, Iowa, Minnesota, Kansas, Nebraska and Colorado. Meetings will be held by executives not oftener than once a month, and there probably will be an annual meeting.

The purpose of the organization is to provide a means of finding out what are the specific problems of operation for companies under similar conditions and evolving definite suggestions on the best ways to meet these problems. Col. P. J. Kealy, president of the Kansas City Railways, who was appointed a member of the committee on reconstruction and adjustment of franchises by the American Electric Railway Association at its recent meeting, suggested the meeting in Omaha as a means through which the operators of the district could bring about the expression of their position.

The meeting was notable for its optimism and the courage of the operators present with reference to tackling the problems before them. There was general oppposition to any tendency to turn the properties over to municipalities, and general concurrence in the idea of operation on a cost basis.

It is expected to provide the national association with definite information on the electric railways in communities of 50,000 or more population, and with the views of the operators on the advisable action to take. The new body will co-ordinate with state associations, indirectly through the operators who are members of both the state and the Trans-Mississippi; and directly through the representatives of the state associations on the Trans-Mississippi rolls.

Gordon W. Wattles, president of the Omaha & Council Bluffs Street Railway, acted as chairman of the meeting, and R. A. Leussler, assistant general manager of the same company, acted as secretary. There will be no officers or boards.

The next session will be held in Kansas City, about the middle of December.

The following railway officials attended the first meeting of the new association:

Gordon W. Wattles, President, Omaha & Council Bluffs Street Railway.
Philip J. Kealy, President, Kansas City Railways.
R. A. Leussler, Assistant General Manager, Omaha & Council Bluffs Street Railway.
Emil Schmidt President. Des Moines City Railway and Interurban Railway
F. G. Buffe. Assistant to the President, Kansas City Railways.
E. L. Kirk. General Manager, Sioux City Service Company.
Foster Hannaford, General Manager, Twin City Rapid Transit Company, Minneapolis.
F. W. Hild, General Manager, Denver Tramway.
J. H. Van Brunt, Vice-President and General Manager, St. Joseph Railway, Light, Heat & Power Company.
B. J. Denman, President, Tri City Railway & Light Company and Assistant General Manager, United Light & Railways Company.
J. M. Bramlette, Vice-President and General Manager, Lincoln Traction Company.
Frank T. Hamilton, Vice-President, Omaha & Council Bluffs Street Railway.

Albert Patten, assistant general manager of the properties of the Illinois Traction Company in Kansas, was not present at the meeting, but notified the new association of his desire to co-operate. His company operates the electric railways in Atchison, Wichita and Topeka.

The states included in the organization are Missouri, Iowa, Minnesota, Kansas, Nebraska and Colorado.

The resolutions which were adopted as a basis of organization for the new association follow:

Resolved that an organization of street railway operators in the State of Missouri, Iowa, Minnesota, Kansas, Nebraska and Colorado, be formed along the lines following:

1. It shall be known as the Trans-Mississippi Electric Railways Association.

2. There shall be no dues. In case it is decided to hold a general convention the expenses for it shall be raised by assessment. There shall be no entertaining other than a luncheon to be given by the chairman.

3. The meetings shall be held not more often than once a month in rotating order, the representative from the city selected to act as chairman of that meeting.

4. The voting membership to consist of a selected representative of companies operating in cities over 50,000 population, representatives of companies operating in two or more cities whose combined populations shall exceed 50 000. Also one representative, other than the above, to represent each state association which shall be its president, or an alternate who shall be an electric railway operator.

5. That the members of this association retain their membership in the various State Associations and the American Electric Railway Association so that it will co-ordinate the various activities and represent in concrete form the combined thought of the street railway industry in the territory covered.

Mr. Walsh Resigns

Frank P. Walsh, joint chairman with William H. Taft on the War Labor Board on Nov. 19 sent his resignation to President Wilson, with the explanation that professional engagements required his return to his law practice at the earliest possible moment now that hostilities have ceased. A resolution had previously been sent to President Wilson under the signature of Chairman Taft and Vice-Chairman Black, asking that the members be relieved from their duties with the board at the earliest possible moment.

On Nov. 22 Messrs. Taft and Walsh were urged by Secretary of Labor Wilson to remain in charge of that board so that its activities can be continued until the peace treaties have been signed and the problems of labor have been dealt with in connection with reconstruction.

News Notes

Emergency Power Bill Abandoned.—It is reported from Washington that it is probable no further effort will be made to enact the emergency power bill to provide electric current for war industries.

Des Moines Millmen Return to Work.—Millmen employed by the Des Moines (Iowa) City Railway have returned to work and accepted 52½ cents an hour upon suggestion of W. H. Rogers, federal mediator. The company offered the men this scale shortly after they went on a strike about three weeks ago. About twenty-five men were involved.

Toledo Will Take Back Men in Service.—Officers of the Toledo Railways & Light Company, Toledo, Ohio, are making a survey for the purpose of determining what places can be offered each of its 500 employees who went into the military service and will soon return. Frank R. Coates, president of the company, said that every man will be given as good or a better position than he left.

Holyoke Strike Settled.—The operation of the Holyoke Street Railway was resumed on Nov. 15 after a complete tie-up of six days, during which the employees were on strike, as a result of failure to agree with the company on an arbitrator preliminary to consideration of wage and other demands. The deadlock was broken by the acceptance of Henry B. Endicott to arbitrate points on which an agreement cannot otherwise be reached.

To Act Against Wooden Cars.—Charles S. Harvey of the Public Service Commission for the First District of New York will introduce a resolution calling for an immediate inquiry by the commission to decide how much longer the New York Consolidated Railway (Brooklyn Rapid Transit System) is to be permitted to operate wooden cars on the Centre Street subway loop which extends from the Manhattan end of the Williamsburg Bridge to the Municipal Building at Chambers Street.

Trenton Men Accept Forty-two Cents.—The platform men in the employ of the Trenton & Mercer County Traction Corporation, Trenton, N. J., met on Nov. 23 and decided to accept the company's offer of an increase in wages to 42 cents an hour for straight time and 45 cents for all overtime. The former rate of pay was 38 cents an hour. The men asked for 50 cents an hour and 60 cents for overtime. All other classes of employees will receive a raise in wages of from 2 to 11½ cents an hour. The new wage scale is to date from Oct. 15. According to the agreement between the company and men the latter cannot go on strike, but the employees at one time threatened to quit individually if the matter was not settled promptly.

Wants Paducah Franchise Modified.—A. S. Nichols, manager of the Paducah (Ky.) Traction Company, recently placed before the City Commission a new franchise ordinance which he is endeavoring to have adopted. Under the terms of the franchise the company would be permitted to discontinue any line that failed to prove profitable; would no longer be forced to maintain streets inside of its tracks and for 1 ft. each way; and would be permitted to keep a franchise alive by operating a car over any line once in ten days, instead of losing $20 for each day that a car is not operated over a line, at hourly intervals. The railway property is now being operated by a receiver appointed because of the inability of the company to continue service at pre-war rates and under franchise terms that conditions made unduly burdensome.

Union Injunction Suit Hearing on Dec. 4.—Arguments on motions for the dismissal of an injunction suit filed by the Indianapolis Traction & Terminal Company, Indianapolis, Ind., against members of the executive committee and organizers of the local railway union to prevent a strike, and against the city of Indianapolis to test a city ordinance, were set for Dec. 4 by Judge A. B. Anderson in Federal Court in Indianapolis. Attorneys for both sides have agreed upon the date. No final action by the court on the petition for the injunction is expected before Dec. 13, the date on which the sixty-day trial period of the straight 5-cent fare plan terminates. It is said that there is some likelihood that the company officials and the men will come to an agreement on the request of the men for better working conditions before the final hearing on the injunction suit.

Protecting Its Water Rights.—Lumber operations have been started on the extensive acreage owned by the Rutland Railway, Light & Power Company, Rutland, Vt., to protect its water rights. This will cover approximately 200,000 ft. of spruce and hardwood; also 100,000 ft. of white pine. About 700 cords of stove wood and pulp wood are ready and will be delivered as rapidly as possible. The Rutland Railroad is considering the purchase of a quantity of birch, maple and beach crossties. The Rutland Railway, Light & Power Company has been conserving its water supply in its reservoirs, so that at the present time its stock supply is larger than a year ago and sufficient to take care of all increased business. The company has several hydroelectric developments with and without reservoirs with reserve capacity in each. It does not own or operate any steam plant at the present time.

Programs of Meetings

Investment Bankers' Association

The annual convention of the Investment Bankers' Association, which was to have been held in St. Louis, Mo., on Nov. 18, 19 and 20, was postponed because of the influenza epidemic. The new dates set forth for the convention are Dec. 9, 10 and 11.

Southwestern Electrical & Gas Association

The second quarterly conference of the Southwestern Electrical & Gas Association will be held at the Hotel Bender, Houston, Tex., on Dec. 9. The morning session will be called at 9.30 a.m. There will be a luncheon at 12 o'clock noon. The afternoon session will be called at 1.30 p.m.

National Civic Federation

The reconstruction committee of the National Civic Federation will hold a meeting at 1 Madison Avenue, New York, on Dec. 2, at 10.30 a.m. to consider the following questions:

What part of the so-called labor and capital war measures devised by the government shall be retained at the conclusion of war?

How far are compulsory measures which were necessary under emergency conditions to be continued after peace is restored?

What changes in our immigration policy will be forced by economic and other results of the war?

Academy of Political Science

War labor problems and reconstruction will be the general topic of a two-day conference which the Academy of Political Science is to hold in New York City on Dec. 6 and 7. Attendance at the sessions will not be restricted to members but the academy will open its doors to all public-spirited citizens looking forward to the new era in public affairs.

"Women in Industry" is the topic fixed for the first session, beginning on Dec. 6 at 2.30 p.m., at Horace Mann auditorium, and "War Labor Standards and Reconstruction" will be the subject discussed at the evening session in the same auditorium.

The next day's meetings will begin at 10.30 a.m., in the Belvedere room of the Hotel Astor and will consider "Adjustments of Wages and Conditions of Employment," and "Demobilization of Labor in War Industries and in Military Service."

Charles M. Schwab and William B. Wilson, Secretary of Labor, will address the final meeting of the conference, which will be a dinner, held also at the Hotel Astor. "Our Industrial Victory and Its Effect on the Future Relations of Labor and Capital" is the subject for the addresses to be made.

The executive offices of the Academy of Political Science are at Kent Hall, Columbia University, New York.

Financial and Corporate

Operating Ratio Increases

Highest of Any but Two Months Since the Collection of Operating Statistics Began

The most notable feature in the comparison made by the information bureau of the American Electric Railway Association of revenues and expenses of electric railways for August, 1917 and 1918, is the greatly increased operating ratio shown for the United States. This is 70.50 per cent for 1918, as against 65.82 for 1917, and with the exception of the months of January and February, 1918, is the highest operating ratio for all months since the association began the compilation and publication of the statistics.

The showing is all the more discouraging, since in the Western district there was a marked increase in net earnings and a corresponding decrease in operating ratio. In this connection a comparison of operating ratios for the first eight months of 1918, with those of the corresponding months of 1917, is of interest. It follows:

	Jan.	Feb.	March	April
1917	65.10	66.91	64.89	64.66
1918	73.60	72.00	67.80	67.97

	May	June	July	Aug.
1917	64.95	65.10	63.12	65.82
1918	67.67	69.07	66.97	70.50

It will be seen that while the Western district shows a decrease in operating ratio of 2.37 per cent, the Eastern district shows an increase of 8.52 per cent and the Southern district an increase of 7.41 per cent, and the country as a whole an increase of 4.62 per cent. In spite of the decrease there the ratio for the Western district is the highest in the country.

For companies reporting taxes the operating ratios are higher, the companies in the Eastern district again making the most unfavorable showing.

Both the Eastern and Southern districts show a further decline in net income. For roads not reporting taxes this amounts in the Eastern district to 14.41 per cent and for the Southern district 14.72 per cent, while for the country it is 4.39 per cent in spite of the fact that the Western district shows an actual increase of 24.72 per cent. There was for the country a falling off in net earnings of $33 per mile of line—for the Eastern district $119 and for the Southern $101—while the Western district showed an increase of $143.

Taxes increased somewhat uniformly throughout the country—In the Eastern district, 17.19 per cent; in the Southern, 14.49 per cent, and in the Western, 16.85 per cent, while for the country the increase was 16.67 per cent.

The Eastern district showed a falling off in operating income of 25.59 per cent, which was about balanced by the increase of 25.86 per cent in operating income shown by the Western district. The country as a whole showed a decrease because of the figures from the Southern district.

The returns from the city and interurban electric railway companies, as shown in detail in the accompanying tables, have been classified according to the following geographical grouping: Eastern district—east of the Mississippi River and north of the Ohio River. Southern district—south of the Ohio River and east of the Mississippi River. Western district—west of the Mississippi River.

Toronto Net Declines

While the gross earnings of the Toronto (Ont.) Railway in the calendar year 1917 showed an increase, the net earnings were adversely affected by the increase in wages and the abnormal war prices for supplies.

The gross income increased $318,597 or 5.3 per cent for 1917, this being slightly less than the gain of $321,057 in passenger earnings. In view of the large number of men overseas, the company regarded this increase as satisfactory.

The operating expenses, however, rose $464,619 or 13.9 per cent, so that the net earnings fell off $146,022 or 5.5 per cent. The payments made to the city of Toronto showed an increase of $74,021 for the year.

The passengers carried in 1917 totaled 158,087,984, an increase of 8,558,230 as compared to the traffic in 1916. The transfers increased by 958,873 to 62,301,636.

Out of accumulated surplus the company in 1917 paid four quarterly dividends of 2 per cent. The balance carried forward at the end of the year was $5,543,683.

INCOME STATEMENT OF TORONTO RAILWAY FOR YEARS ENDED DEC. 31, 1916 AND 1917

	1917 Amount	1917 Per Cent	1916 Amount	1916 Per Cent
Gross earnings	$6,291,759	100.0	$5,973,161	100.0
Operating expenses	3,815,278	60.7	3,350,658	56.1
Net earnings	$2,476,481	39.3	$2,622,503	43.9
Interest on bonds	$146,888	2.3	$156,122	2.6
Percentage on earnings	970,512	15.4	909,881	15.2
Pavement taxes	264,271	4.2	215,707	3.6
Total	$1,381,671	21.9	$1,281,710	21.4
Surplus earnings	$1,094,810	17.4	$1,340,793	22.5

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR AUGUST, 1918 AND 1917

Account	United States Amount, August, 1918	United States Per Mile of Line 1918	1917	% Increase Over 1917	Eastern District Amount, August, 1918	Eastern District Per Mile of Line 1918	1917	% Increase Over 1917	Southern District Amount, August, 1918	Southern District Per Mile of Line 1918	1917	% Increase Over 1917	Western District Amount, August, 1918	Western District Per Mile of Line 1918	1917	% Increase Over 1917
Operating revenues	$14,276,115	$2,434	$2,197	10.79	$8,002,386	$2,393	$2,170	10.28	$1,197,604	$1,677	$1,622	3.39	$5,076,125	$2,811	$2,460	14.27
Operating expenses	10,063,934	1,716	1,446	18.67	5,638,129	1,686	1,344	25.45	779,585	1,092	936	16.67	3,646,220	2,019	1,825	10.63
Net earnings	4,212,181	718	751	†4.39	2,364,257	707	826	†14.41	418,019	585	686	†14.72	1,429,905	792	635	24.72
Operating ratio, per cent	1918, 70.50; 1917, 65.82				1918, 70.46; 1917, 61.94				1918, 65.12; 1917, 57.71				1918, 71.82; 1917, 74.19			
Av'ge number of miles of line	1918, 5,865; 1917, 5,764				1918, 3,345; 1917, 3,318				1918, 714; 1917, 661				1918, 1,806; 1917, 1,785			

COMPANIES REPORTING TAXES

Operating revenues	$9,538,265	$2,470	$2,219	11.31	$4,449,490	$2,242	$2,051	9.31	$467,832	$1,964	$1,697	15.73	$4,620,943	$2,820	$2,498	12.89
Operating expenses	6,947,191	1,799	1,543	16.59	3,279,399	1,653	1,333	24.01	288,505	1,211	953	27.07	3,379,287	2,062	1,883	9.51
Net earnings	2,591,074	671	676	†0.74	1,170,091	589	718	†17.97	179,327	753	744	1.21	1,241,656	758	615	23.25
Taxes	675,476	175	150	16.67	296,962	150	128	17.19	37,570	158	138	14.49	340,944	208	178	16.85
Operating income	1,915,598	496	526	†5.70	873,129	439	590	†25.59	141,757	595	604	†1.49	900,712	550	437	25.86
Operating ratio, per cent	1918, 72.83; 1917, 69.54				1918, 73.73; 1917, 64.99				1918, 61.66; 1917, 56.16				1918, 73.12; 1917, 75.38			
Av'ge number of miles of line	1918, 3,861; 1917, 3,812				1918, 1,984; 1917, 1,959				1918, 238; 1917, 235				1918, 1,639; 1917, 1,618			

† Decrease.

Unscrambling Pittsburgh's Eggs

Receiver Asks for Master to Determine Distribution of Funds to Subsidiary Companies

Judges C. P. Orr and W. H. S. Thomson in the United States Court at Pittsburgh, Pa., on Nov. 15, indicated that, on petition of Charles A. Fagan, minority receiver for the Pittsburgh Railways, a master will be appointed to systematize the payment of fixed charges for bond interest, mortgages and rentals. Judge Orr then ordered the receivers to pay fixed charges due in November amounting to $234,116.

The charges ordered paid are as follows: Rental, Citizens' Traction Company, $90,750; rental, Pittsburgh & Birmingham Passenger Railway, $66; interest, Title & Trust Company, $5,000; 5 per cent gold car trust bonds, $17,000; interest, Millvale, Etna & Sharpsburg Street Railway, $18,525; interest, Pittsburgh Birmingham Traction Company, $37,500; interest, Pittsburgh & Charleroi Street Railway, $61,125; interest, West Braddock Bridge Company, $4,150.

The order of the court in regard to the interest payments was made in compliance with the request of Majority Receivers J. D. Callery and H. S. A. Stewart. The payments were ordered subject to the limitations of the opinion of the court on Sept. 7.

The court proceedings of Nov. 15 came up on a request from Receiver Fagan for the appointment of a master. His appeal recited that the Pittsburgh Railways was divided into three distinct parts, or underlying companies, and reviewed at length the intercorporate relations of the companies. Mr. Fagan said that on account of previous orders made by the court the receivers will not have sufficient funds to make payment in full of all the fixed charges required to be paid and at the same time make the necessary improvements and betterments to the system called for under franchise grants or by orders of the Public Service Commission.

The master, Receiver Fagan suggested, should be appointed to ascertain: First, what funds are available for the payment of fixed charges; second, to whom said fixed charges shall be first paid; third, whether or not said fixed charges shall be paid in full or partly, and, fourth, to arrange a schedule and rule by which the receivers may be guided in the payment of all fixed charges while operating the lines which are now in their charge.

Attorney E. W. Smith, counsel for the bondholders and former counsel for the receivers, did not oppose the master's appointment if the appointment did not appear to tie the hands of the court. He said he favored the appointment of a "neutral official," who would be independent of influence either by the railway or the city. Mr. Smith also argued for the petition of the Consolidated Traction Company, which he represents, asking that the solvent and insolvent underlying companies be separated in accounts kept by the receivers.

Higher in Hawaii

The gross passenger traffic of the Honolulu Rapid Transit & Land Company, Honolulu, T. H., for 1917 showed a marked increase over that for the preceding year, the revenue passengers numbering 14,378,092, an increase of 1,164,392. The transportation revenue at $713,338 represented a gain of $57,418, and the gross operating revenue at $726,603, a gain of $56,621.

Only $18,090 of this increase was reflected in net operating revenue, however, on account of the mounting costs of operation. The operating expenses for 1917 totaled $393,966, a rise of $38,530. The income deductions amounted to $379,025, an increase of $86,697, with the result that the 1916 surplus of $22,218 was converted in 1917 to a deficit of $46,388.

The increase in operating expenses was due mostly to a rise in transportation expenses from $203,366 to $229,725, and in general and miscellaneous expenses from $49,165 to $61,501. The expenses for maintenance of way and structures dropped off from $60,366 to $55,509, but those for maintenance of equipment rose from $34,612 to $37,477.

The 1917 expenditures for additions and improvements totaled $92,962. The operating revenues per car-mile in 1917 were $0.3563, a gain of $0.0286, and the operating revenues per car-hour $3.300, a gain of $0.213. The operating expenses per car-mile amounted to $0.1931, an increase of $0.0193, and the operating expenses per car-hour $1.789, an increase of $0.151.

Progress Reported in Reorganization

An adjustment of remaining details in the reorganization of the properties of the Northern Electric Railway, Chico, Cal., was discussed before the State Railroad Commission recently in a hearing on the application of the Sacramento Northern Railroad to sell bonds to remove obligations carried by the Northern Realty Company.

When the Northern Electric properties were transferred to the new company—the Sacramento Northern—by the organization committee, stock of the Northern Realty Company was included in the transfer.

The property of the Northern Realty Company had been mortgaged to the Sloss Securities Company for $273,000, and the settlement which the Railroad Commission is being asked to approve includes the payment to the Sloss Securities Company of $135,750 in cash from the sale of Sacramento Northern securities, and the retransfer by the Sacramento Northern to the Sloss Securities Company of properties that are not considered useful for railroad purposes.

Financial News Notes

Cape Town Progressing.—The Cape Town Consolidated Tramways & Land Company, Ltd., Cape Town, S. A., showed a debit balance of £539 for the calendar year 1917 as compared to £630 for the preceding year. The subsidiary tramway company increased its year's profit from £2,225 in 1916 to £3,018 in 1917. The receipts rose £3,794 and the expenses £3,001.

Abandonment to Proceed.—Judge Morton in the United States District Court at Boston, Mass., on Nov. 20 declined to interfere with the intention of Receiver Donham of the Bay State Street Railway to discontinue certain routes which fail to pay operating expenses. The court set Dec. 4 for a hearing on the receiver's petition relating to other lines.

Another Abandonment Proposed.—The Southern New York Power & Railway Corporation, Cooperstown, N. Y., has filed with the Public Service Commission for the Second District, a petition for approval of intention to abandon that part of its road in Lake Street from near Bronner Street in Richfield Springs to near the company's passenger station. The company alleges that operation of that part of the road is no longer necessary because the company has purchased a private right-of-way from near its station to a point in Lake Street, south of its intersection with Bronner Street. The commission will order a public hearing.

Municipal Railway Bonds Sold.—Attleboro, Mass., has sold $22,500 of 4½ per cent "street railway loan, act of 1918" bonds, dated Oct. 1, 1918, payable $2,250 annually, Oct. 1, 1919-1928 inclusive, to E. H. Rollins & Sons, Boston, Mass., at $101,076. The bonds were issued by Attleboro in accordance with the act of the last Legislature authorizing the city to purchase and operate that part of the old Bristol County Street Railway between Attleboro and Briggs Corners. As described in the ELECTRIC RAILWAY JOURNAL for Nov. 23, page 933, the city used $18,000 of the proceeds of the bonds to acquire the road and $4,500 to restore the line to service.

Local Claremont Interests Buy Road.—The property of the Claremont Railway & Lighting Company, Claremont, N. H., has been sold to a corporation made up of local manufacturers, who will endeavor to operate the road according to its usual high standards. The new corporation took charge on Nov. 16. As stated previously in the ELECTRIC RAILWAY JOURNAL, the company gave notice some time ago that it would discontinue business. It was prevented from carrying out this plan,

however, by injunction proceedings. Later a receiver was appointed for the company. The property consists of an 8.60-mile road extending from Claremont Junction through Claremont to West Claremont.

Seeks Renewal of Loan.—The United Railways, St. Louis, Mo., has asked the War Finance Corporation to renew the loan of $3,235,000 which it made to the railway last May. The loan was dated June 1 for a six months' period, and the interest rate was 7 per cent. The loan is secured by the entire issue of first and underlying mortgage bonds of the Union Depot Railroad, plus $800,000 in Liberty bonds. The loan to the St. Louis company was the first one made in the electric railway field by the War Finance Corporation. The life of that corporation expires six months after the termination of the war, as proclaimed by the President, but the corporation has ten years in which to liquidate.

Spokane Abandonment Hearing on Dec. 9.—The Public Service Commission of the State of Washington has set Dec. 9 as the date of hearing the protests against the plan of the Washington Water Power Company for abandoning service on some of its lines in Spokane. The hearing was originally set for October, following an order from the City Council to the company to fulfill its alleged franchise obligation and furnish service, but because of the Spanish influenza epidemic the hearing could not be held at that time and the city allowed the matter to rest. City Attorney T. J. Geraghty contends that the furnishing of service is a franchise obligation and can be altered only by agreement between the city and company.

Abandonment Prevented. — Judge F. M. Spann, sitting at Belton, Tex., has granted a temporary injunction restraining the owners of the Southwestern Traction Company from dismantling its lines and discontinuing service. The company owns and operates the interurban railway between Belton and Temple, as well as the city lines in both cities. It had signified its intention of discontinuing service in the Belton-Temple interurban line and tearing up the track for junk because further operation of the line was declared to be unprofitable. The order of the court directs the company to continue operation of its cars as heretofore on both the interurban and the city lines.

Taxes Are Compromised.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., has agreed to a compromise with the city of Trenton on the tax levies for the years 1915, 1916, 1917 and 1918. By the compromise the city gains from the company $1,540,000 in valuation over the assessments for the four years, or $385,000 for each year. This is an increase in the property valuation of nearly 50 per cent. Taxation levies on the company's property have been in litigation since 1915. Both the company and the city agreed to bear a share of the expense of the litigation to this time. In 1915 the company paid a tax on a physical valuation of its property to $815,000 while the property is at present valued at $1,200,000 under the terms of the compromise agreement.

Operating Difficulties in Lisbon.—The result of the operations of the Lisbon (Portugal) Electric Tramways, Ltd., for the calendar year 1917 was a net profit of £16,678. After reserving £10,000 for depreciation, paying £12,766 in preference dividends and taking in the prior balance, £3,135 remained to be carried forward. The passengers increased from 76,620,194 in 1916 to 79,434,362 in 1917. Owing to higher operating costs, however, and the suspension of operation on several occasions because of strikes and political disturbances, the preference divided for the second six months of the year was passed. The company increased the price of its season tickets 40 per cent, but all this increase was required to meet the demands of its employees for higher wages.

Road Sold Under Foreclosure.—The property of the St. Louis, Lakewood & Grant Park Railway and the Carondelet & Webster Grove Railroad, St. Louis. Mo., was sold on Nov. 22 at the courthouse under foreclosure to John F. Betts. The railroad was promoted by Henri Chouteau. It consisted of an electric railroad extending from the end of the line of the United Railways on Gravois Avenue to the vicinity of Lakewood, St. Louis County, with a branch leading to Carondelet. It has not been in operation for two years. John C. Tobin, special master, who conducted the sale, announced that the assets consisted of real estate, easements, franchises, depots and bridges. The rolling stock and rails which had formerly been in use were sold some time ago for junk.

Stock Dividend Increased.—The directors of Cities Service Company, New York, N. Y., at their meeting on Nov. 20 declared the regular monthly cash dividend of 50 cents a share on the preferred stock and the common stock, and increased the monthly dividend on the common stock, payable in common stock at par, from three-quarters of 1 per cent monthly to 1 per cent monthly, all these dividends being payable on Feb. 1, 1919, to stock of record of Jan. 15, 1919. This action of the board of directors indicates that the dividend on Cities Service Company common stock in 1919, payable in common stock at par, will be at the rate of 12 per cent per annum instead of at the rate of 9 per cent as in the current year. The company plans to convert its outstanding series B debentures.

Electric Railway Monthly Earnings

CITIES SERVICE COMPANY, NEW YORK, N. Y.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net income
1m., Sept., '18	$1,907,155	$54,853	$1,852,302	$48,628	$1,803,674
1m., Sept., '17	1,594,961	28,588	1,566,373	227	1,566,146
12m., Sept., '18	21,973,480	449,361	21,524,119	100,642	21,423,477
12m., Sept., '17	18,169,849	327,646	17,842,203	3,151	17,839,052

CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m., Oct., '18	$1,784,000	$57,013	$1,726,987	$60,345	$1,666,642
1m., Oct., '17	1,659,665	29,646	1,630,019	226	1,629,793
12m., Oct., '18	22,097,814	476,727	21,621,087	160,761	21,460,326
12m., Oct., '17	18,706,604	337,251	18,369,353	2,984	18,366,369

GRANDRAPIDS (MICH.) RAILWAY

1m., Aug., '18	$107,383	*$87,174	$20,209	$19,438	$771
1m., Aug., '17	109,269	*77,203	32,066	18,476	13,590
12m., Aug., '18	1,280,094	*960,399	319,695	230,835	88,860
12m., Aug., '17	1,305,304	*871,233	434,071	209,954	224,117

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

1m., Aug., '18	$97,837	*$73,686	$24,151	$19,809	$4,342
1m., Aug., '17	$100,579	*61,192	39,387	15,498	23,889
12m., Aug., '18	877,803	*754,241	123,562	210,679	†87,117
12m., Aug., '17	875,287	*645,783	229,504	185,464	44,040

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

1m., Aug., '18	$249,935	*$163,564	$86,371	$40,104	$46,267
1m., Aug., '17	200,686	*133,775	66,911	41,374	25,537
12m., Aug., '18	2,666,946	*1,705,247	961,699	487,313	474,386
12m., Aug., '17	2,431,327	*1,546,716	884,611	495,209	389,402

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '18	$271,642	*$174,078	$97,564	$40,225	$57,339
1m., Sept., '17	210,085	*134,315	75,770	40,980	34,790
12m., Sept., '18	2,728,503	*1,745,010	983,493	486,558	496,935
12m., Sept., '17	2,434,511	*1,553,323	881,188	494,302	386,886

NEW YORK (N. Y.) RAILWAYS

1m., Oct., '18	$948,376	*$870,057	$78,319	$277,253	††$154,261
1m., Oct., '17	1,048,291	*770,731	277,560	281,058	‡50,580
3m., Oct., '18	2,781,136	*2,394,616	386,520	835,286	†‡317,924
3m., Oct., '17	3,285,291	*2,370,308	914,983	846,610	‡219,772

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

12m., Sept., '18	$7,016,315	$4,584,826	$2,431,489	$1,131,375	$1,300,114
12m., Sept., '17	6,126,219	3,696,998	2,429,221	956,507	1,472,713

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., Sept., '18	$826,728	$573,360	$253,398	$172,633	$80,765
1m., Sept., '17	849,506	556,756	292,750	167,620	125,130
9m., Sept., '18	7,299,515	5,224,569	2,074,946	1,442,296	632,650
9m., Sept., '17	7,732,106	5,104,861	2,627,245	1,356,714	1,270,531

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., Oct., '18	$751,696	$550,256	$201,440	$185,977	$15,463
1m , Oct., '17	805,687	592,071	213,616	170,118	43,498
10m., Oct., '18	8,051,211	5,774,824	2,276,387	1,628,274	648,113
10m., Oct., '17	8,537,793	5,696,931	2,840,862	1,526,832	1,314,030

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

Traffic and Transportation

Increase for Hudson Valley Railway

New York Commission Allows Emergency Rates Sufficient to Prevent Suspension of Service

The Public Service Commission for the Second District of New York has authorized the Hudson Valley Railway, Glens Falls, to charge a 6-cent fare in each of its zones where 5 cents is now charged. The order passed by the commission provides that fares so fixed "shall continue only during the war and a reasonable time thereafter and that this determination and order may be reopened at any time if and when it may appear to this commission that the reasons for permitting the company to charge the increased fares no longer exist." The new fare rates are to become effective on five days' notice.

Franchise Provisions Waived

The commission had previously suspended operation of a new schedule of rates, filed as effective on Aug. 29, 1918, pending an investigation.

The company operates 140 miles of line from Waterford to Mechanicville, Schuylerville, Fort Edward, Hudson Falls, Glens Falls, Lake George to Warrensburg with a branch road from Mechanicville to Ballston Springs and through Saratoga Springs to Glens Falls and from Thomson to Greenwich. There is local service in Saratoga Springs and in Glens Falls, including a portion of the road between Glens Falls, Hudson Falls and Port Edward.

There are franchise provisions in Saratoga Springs, Glens Falls and Ballston Springs limiting the rate of fare to 5 cents. Waivers of these restrictions were made by the local authorities and submitting the fixing of rates to the commission with a maximum of 6 cents. No serious opposition was made to the proposed increase and no evidence was presented controverting in any degree that offered by the company.

The commission states that it is apparent that at the present amount of travel and present rates of fares the road will for the period beginning July 1, 1918, be in receipt of revenue hardly sufficient to pay its operating expenses alone without taking into consideration at all the matter of charges upon its indebtedness or return upon the capital investment.

The memorandum of Commissioner Chency says in part:

"Unless some relief is had the inevitable result will be bankruptcy, with a possible discontinuance of operation. The only alternative is such an increase in rates that the income will be sufficient to justify the continued operation of the line.

"Although it is apparent that the company is entitled to and must have an increased revenue, it is not asking in this proceeding that an order be made fixing rates at such a sum as will yield an adequate return upon the capital invested, as is its right. It is only asking that it may be permitted to put into effect certain specified rates, and the commission has treated the proceeding as involving only the question as to whether or not such proposed rates are reasonable, and has not gone into any of the questions which ordinarily arise in a rate case where the effort is to arrive at a rate schedule which will realize sufficient revenue to pay operating expenses and leave a surplus which will be an adequate return upon the value of the property used in the service. In other words, this case has been treated as an emergency case, the result to be attained being the fixing of a rate which would pay operating expenses and interest charges to which the company is subjected so that it may be continued in operation. The matter of return on capital must wait until after the war is over and more normal conditions prevail.

Increased Wages Eat Up Fare Advance

"Even if the maximum amount of increase is realized, it will practically all be paid out in increased wages already in effect. Increased price in materials will in all probability absorb any balance there may be."

The road, it is stated, is in first-class operating condition and while no detailed valuation was made there is evidence placing a value for rate purposes of $5,000,000, which is practically the amount of the interest-bearing indebtedness.

Illinois State Rate Attacked

Attacking the Illinois State Railroad rate law as being unconstitutional, the Aurora, Plainfield & Joliet Railway, Joliet, Ill., through its counsel, Winston, Payne, Strawn & Shaw, has filed a bill for injunction in the United States District Court asking an injunction against the Public Utilities Commission of Illinois and the state's attorneys of Will, Kane and Kendall Counties, to prohibit them from enforcing it.

The railway, an electric interurban line of 22 miles doing principally a passenger business, recently asked the Public Utilities Commission for permission to raise its rates from 2 to 3 cents a mile. Under the State law a fare of but 2 cents a mile within the State is permissible.

Dallas Traffic Study Explained

Engineering Expert Explains to Police Just What It Is Hoped to Accomplish

A. M. Buck, chief assistant to John A. Beeler, traffic expert retained by the city of Dallas, Tex., addressed the Dallas police on Nov. 5 and answered questions propounded by the men. John Ryan, chief of police, introduced Mr. Buck. He said the instructions were intended chiefly for the traffic officers, but that he felt they would be of benefit to the entire staff.

Police Vitally Interested

Mr. Buck began his address with the statement that he would only take up the points of the Beeler recommendations which directly concerned the traffic situation as affecting the policemen. He explained that the proposed platforms for loading and unloading street cars will be built opposite each other at the principal stops. He said in part:

"Thus you see it will mean the elimination of the present plan of stopping the cars on the near side of the street. In the business district the platforms will be located exactly opposite each other on the east side of the crossing of Elm and Main Streets, at Akard and Ervay Streets, and on the west side of the Commerce Street crossings.

"This plan will mean confusion at first, but later on I believe you will find that the people will take to it splendidly. Lines will be painted on the streets in order to keep the pedestrians within certain boundaries, and traffic officers will have to see that the pedestrian line moves only in accordance with the regular lines of vehicular traffic.

"The double-berthing idea will mean that two cars are to load at each stop whenever practical and that you men will have to move them together as fast as possible. The second car of the line at the intersection will load and unload its passengers from its position behind the first car, and when the first car is signaled on the second car will not be permitted to stop where the first car was halted, but will be required to move on as the other did. In this way you will assist largely in speeding up the electric railway service.

Precedence for Street Cars

"Then, too, we must consider the plan of giving the street car precedence over automobile traffic. You know it is customary for the average policeman to speed up an automobile. This is done in some instances where street cars containing from forty to one hundred persons are compelled to wait. Manifestly this is not just. No street car carrying workmen should be held up to allow an automobile, carrying an average of two persons, the right of way."

Mr. Buck also referred to the operation of traffic signals by the police from the curb.

Surface Lines Ask More

Chicago Companies Want to Charge Seven Cents—Decrease of $4,500,000 in Earnings Likely

Following the award of a 6-cent fare to the elevated roads, the Chicago Surface Lines on Nov. 21 filed a petition with the Public Utilities Commission to charge a 7-cent rate.

The application sets forth that a 5-cent fare is no longer adequate for several reasons. The high wages fixed by the War Labor Board made such additions to the payroll that the increase for the year which will end July 31, 1919, is expected to be in excess of $3,700,000. Federal taxes will probably show a further increase of $142,000. The first three months after the wages were raised showed a decrease of $253,093 in earnings and an increase of $1,087,077 in operating expenses, thus making a loss in net earnings of $1,340,171. Estimates for the current year contemplate a decrease in earnings of $569,458, an increase in expenses of $3,857,176, and a consequent decrease in net earnings of at least $4,426,634 over the period ended last July. The capital valuation of the surface companies as of Aug. 1, 1918, is set forth as $156,127,356.

The city authorities assert that no definite ruling of the courts has yet been given on the question of the right of the state body to interfere with rates fixed by contract ordinances. The corporation counsel served notice on the commission that the city would appeal to the Circuit Court of Sangamon County for a different ruling in the elevated case. He also expects to resist the application of the Chicago Surface Lines.

The local transportation committee of the City Council on Nov. 20 referred back a letter which Mayor Thompson had written suggesting that steps be taken to forfeit the franchises of the surface lines because of inadequate service. It was made plain to the committee that the specific items of inadequacy mentioned by the Mayor were in reference to matters directly in charge of the city or which had been handled by the company with the approval of the city. The Mayor was also told that enforcement of city ordinances was a matter for consideration by the executive and judicial branches of the city government.

Public Co-operation Received

E. C. Deal, general manager of the Springfield (Mo.) Traction Company, has advised Judge John T. Sturgis, general chairman of the citizens' committee which investigated the railway situation, that he had been authorized to accept the recommendations of the committee.

The acceptance of the recommendations of the committee means an early increase of the wages of the conductors and motormen from 26 and 28 cents an hour to 36 and 40 cents an hour and an increase of railway fare from 5 cents to 6 cents for adults and 3 cents for children. It represents an increase in the wage scale of railway employees by about 45 per cent since July 1. The working day is also reduced.

The next step in the railway question will be an acceptance of the findings of the committee by the City Council. The recommendations will doubtless be effective as soon as the proposed increase of fare is approved by the Public Service Commission.

These matters have been carried to a satisfactory settlement through the cordial co-operation of the citizens as reflected in the attitude of the committees appointed from among them. E. N. Sanderson of Sanderson & Porter, New York, has expressed his appreciation of this co-operation in a communication to Mr. Deal.

New Jersey Case Argued

Argument was heard in the Court of Errors and Appeals of New Jersey on Nov. 25 in the fight by the League of Municipalities against the 7-cent fare and the 1-cent transfer allowed by the Board of Public Utility Commissioners to the Public Service Railway, and the 6-cent fare granted to the Trenton & Mercer County Traction Corporation as a war emergency measure. The Supreme Court recently upheld the action of the commission and the two cases were taken to the higher court.

The brief of R. V. Lindabury and Frank Bergen for the Public Service Railway outlined the litigation and recited the increases in operating and maintenance expense made necessary by the war. It was claimed that the war made an emergency which forced the company last March to apply to the Board of Public Utility Commissioners for permission to increase its fare to 7 cents and to charge 2 cents for an original transfer and 1 cent for a second. The board, by a decision on July 10, denied the company's application, but granted relief to the extent of permitting a charge of 1 cent for an initial transfer, effective on Aug. 1.

The brief then recited the increases in wages made by the company in June and by the War Labor Board in August amounting to $2,716,538 per annum, and referred to the additional ruling by the Board of Public Utility Commissioners allowing the present rate of 7 cents and 1 cent for a transfer. The brief continued:

"Since it is clear that to prescribe a rate is a legislative act, courts cannot set aside an order fixing a rate except for one of three reasons: Because it is discriminatory, and there is no such contention in this case; because the rate is higher than the service is worth, and there is no evidence here that the service is not worth the rate fixed, and because a rate is so low that it does not yield a reasonable return on the fair value of the property properly employed in serving the public, and there is no point of that kind presented in these cases."

Eight Cents in Boston

In Three Months' Period With 40 Per Cent Increase in Fare the Receipts Advanced Only 12.73 Per Cent

Eight-cent fares will supersede the existing 7-cent fares on the Boston (Mass.) Elevated Railway beginning on Dec. 1. The board of trustees of the company issued a statement on Nov. 22 pointing out that the revenue of the company, operating with a 7-cent fare, is insufficient to meet the cost of service as defined by the public control act under which the road is run, and that 8 cents, the next grade of fare above 7 cents, will be put into effect as above announced.

When the present 7-cent fare is discontinued the existing tickets will be redeemed by the company or the tickets accepted, with 1 cent additional, in payment of the new rate. Tickets at the new rate of fare will be issued and sold in the same manner as has been the practice under the 7-cent fare. On Jan. 1, 1919, the fare for school children attending schools of a grade not more advanced than high schools will be 5 cents for a single fare. School tickets will be issued by the company upon conditions to be announced later.

The present 7-cent fare has been in force since Aug. 1, 1918, and a further increase has been generally expected since a statement of the trustees last month to the effect that additional operating expenses expressly required by statute and amounting to $7,500,000 a year must be met. This sum is made up of the recent wage increase established by the War Labor Board, amounting to $3,000,000 a year; an item of additional depreciation of about $1,600,000; an additional rental charge of $400,000 on account of the Dorchester subway; increased cost of coal, $500,000; interest and dividend charges upon recent bond issues and the new preferred stock of the Boston Elevated Railway, of $300,000; and a 5 per cent dividend upon the common stock of the company, of about $1,200,000. In August, September and October, 1918, the company's receipts increased $602,291, or 12.73 per cent above those of the corresponding period of 1917, compared with a 40 per cent advance in the rate of fare.

The official announcement of the company to the public follows in part:

"Pursuant to Chapter 159 of the special acts of 1918 the board of trustees of the company has determined that the revenue of the company, operating with a 7-cent fare, is insufficient to meet the cost of service as defined by said act and will put into effect the next grade of fare above 7 cents as provided by said act. Announcement is therefore made that beginning Sunday, Dec. 1, 1918, the rate of fare for a single ride upon the company's line will be 8 cents and the present 7-cent fare discontinued. Tickets will be issued and sold in the same manner as to-day except for the change in price. The 7-cent tickets may be redeemed at the treasurer's office or by any ticket seller, or may be tendered as fare with 1 cent additional for each fare to be paid."

"Notice is also given that beginning Jan. 1, 1919, the fare for school children attending schools of a grade not more advanced than high schools will be 5 cents for a single fare. School tickets will be issued by the company upon conditions to be announced hereafter."

Transportation News Notes

Fare Increase in Bowling Green, Ky.—William R. Speck, receiver for the Southern Traction Company, Bowling Green, Ky., recently raised cash fares to 10 cents. Twelve tickets, however, are being sold for $1.

Seven-Cent Tariff Filed.—The Norton, Taunton & Attleboro Street Railway, Norton, Mass., has filed with the Massachusetts Public Service Commission a new passenger tariff increasing the fares from 6 cents to 7 cents, to be effective on Dec. 28.

Wants Increase on Interurban.—The Murphysboro & Southern Illinois Railway Company, Murphysboro, Ill., has filed an application with the Public Utilities Commission for an increase in interurban rates between Murphysboro and Carbondale.

Fare Review Denied.—Application by Pasadena, South Pasadena and Alhambra for a writ of review of the order of the Railroad Commission of California increasing the rates of the Pacific Electric Railway between those cities, has been denied by the Supreme Court of California.

St. Joe Wants Eight-Cent Fare.—The St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., has filed notice with City Counselor Charles L. Faust that it has asked for an increase in fare to 8 cents from the present fare of 5 cents. This petition to the State Public Service Commission supersedes a petition for a 6-cent fare filed about a month ago.

Appropriation for Investigation at Columbus.—The City Council of Columbus, Ohio, has approved the appropriation of $750 to recompense E. W. Bemis, Chicago, for checking up figures presented by the Columbus Railway, Power & Light Company in investigating the question of a proper rate of fare under present conditions. Mr. Bemis is also to investigate certain features of the franchise matter.

Evanston Wants Six Cents.—The Evanston (Ill.) Railway has filed a petition for an increased fare on Nov. 18. asking the city authorities of Evanston for power to charge 6 cents. This company was one of the several local Chicago properties affected by the War Labor Board wage award. Another of these companies was the Chicago & West Towns system which began operation under a 7-cent fare on Nov. 11.

Wants Brooklyn Transfers Abolished.—Timothy S. Williams, president of the Brooklyn (N. Y.) Rapid Transit Company, testified before the Public Service Commission for the First District of New York on Nov. 21 that transfers cost the company more than $3,700,000 a year. If transfers could be charged for, the situation with regard to congestion on cars of the surface lines, he thought, would be materially relieved.

Wants Return to Pre-War Basis.—The City Council of Quincy, Ill., is asking the Quincy Railway, included in the Illinois Traction System, to return to its pre-war transportation rate of six rides for a quarter and to abandon the skip-stop system of operating its car. As part of the power for operating the cars at Quincy is furnished by hydro-electric energy, it is thought that the State fuel administration will not object to relieving Quincy of the skip-stop system.

Chicago Elevated Collects Six Cents.—The Chicago (Ill.) Elevated Railways began collecting 6-cent fares at midnight of Nov. 21 and there was little evidence of friction. Britton I. Budd, president of the company, announced that the first day showed a drop of 6 to 7 per cent below normal in traffic. Some of this lost business went to the Chicago Surface Lines, which parallel some of the branches of the elevated and are still operating at a 5-cent fare.

Carrying Soldiers in Washington.—Soldiers stationed at Vancouver Barracks, Vancouver, Wash., will again be permitted to use the street cars of the Portland Railway, Light & Power Company as a means of transportation between Portland and Vancouver. The soldiers will travel only on trailers, and the capacity of the cars will be limited to forty passengers. Civilians will not be permitted to board the trailers at certain points until all waiting soldiers are accommodated.

Service Conference Proposed.—Chairman Charles B. Hill of the Public Service Commission for the Second District of New York, has announced that he will reconvene the conference of last spring over the International Railway's service in Buffalo, looking to such improvements in operation as will preclude the possibility of a repetition of the breakdown last winter. The conference is for the purpose of considering criticisms or suggestions which will be helpful.

Car Capacity Limited in Spokane.—Following a health department order prohibiting public gatherings and limiting the number of passengers that may ride in street cars, R. A. Willson, general superintendent of the Washington Water Power Company was arrested on Oct. 21 on a warrant sworn to by Dr. J. B. Anderson, charging overcrowding of cars. The health department order forbids the railways from carrying passengers in excess of the seating capacity of cars. Dr. Anderson alleges two violations of the order on the part of the railway.

School Fares Attacked.—Receiver Donham of the Bay State Street Railway, Boston, Mass., has filed in the United States District Court a petition in which he attacks the constitutionality of the Massachusetts statutes permitting electric railways to grant half fares to school children. He asks for permission to discontinue such fares on the lines over which he is receiver. Copies of the petition have been sent to the city officials and school committees in Massachusetts, Rhode Island and New Hampshire, through which the Bay State Street Railway operates.

Six Cents for Syracuse and Utica.—The Public Service Commission for the Second District of New York on Nov. 26 authorized the New York State Railways to charge a 6-cent fare in Syracuse and Utica. The commission did not pass on the question of increased fares in Rome, Oneida or Little Falls pending further investigation. The increased fare as granted by the commission provides only for "the duration of the war and a reasonable time thereafter." The proceedings may be reopened when it appears that reasons for the increased fare no longer exist.

Increase for Morris County Company.—An order allowing the Morris County Traction Company, which operates almost exclusively in about twenty municipalities of Morris County, to increase fares was filed by the State Board of Public Utility Commissioners on Nov. 23. Where the company has been selling six tickets for a quarter it will be permitted to charge 6 cents, and where it has been charging a rate of 2½ cents it will be permitted to charge 3 cents. The increases are allowed as a war emergency, to enable the company to gain additional revenue in the sum of $53,998 a year.

Wants One-Man Cars.—The Oklahoma Railway, Oklahoma City, Okla., asks that the part of the city ordinance governing street cars which requires a motorman and a conductor on every car be repealed. The petition sets forth that on account of the scarcity of men and the high cost of operating local lines, and in order to keep the fare at the present rate, it has become necessary for economy in using men to operate cars. The petition further contends that the operation of cars by one man has been successful in other cities and that such cars can be run in Oklahoma without impairment of the service or of the safety to the public.

Six Cents on Baltimore Buses.—The United Railways & Electric Company, Baltimore, Md., which has been operating a bus line on Charles Street, has applied to the Public Service Commission to increase its rates for passengers from 5 cents to 6 cents. The company states that the bus line has been operated with a deficit of $9,155 for the year Oct. 1, 1917, to Sept. 30, 1918. Owing to the increase in the number of patrons who are diverting their route downtown to save the additional cent charged by the company on its lines, the bus line has been so flooded that it is impossible to take care of the traffic with its present equipment.

Seven Cents Cash for Hagerstown.—The matter of fares over the lines of the Hagerstown & Frederick Railway in Hagerstown, Md., has been decided by the Public Service Commission of Maryland. The company wanted to charge a 7-cent fare. The city protested. It also raised the question of impairment of franchise contract provisions. This last charge the commission refused to entertain. On the matter of fares it requires that the railway shall hereafter sell five tickets for 30 cents. Unless tickets are held the fare will be 7 cents. This is only a slight concession, however, as the company has for some months been selling strips of ten tickets in Hagerstown for 60 cents.

Women to Stay.—*The Green Car Traveller* of Nov. 25 pasted in the windows of cars of the New York (N. Y.) Railways promises jobs to its employees returning from the war, saying: "Six hundred and thirteen of our employees are in Uncle Sam's service. When they come home they will find not only a hearty welcome but their jobs. And our more recent employees will also be retained. The war so reduced our forces that there will be work for men old and new—even more. Thanks to the women it has been possible to keep up this service during the war and we shall need them even after our men return. We believe that the great riding public appreciates their service as fully as we do."

Kansas City Eight-Cent Appeal Heard.—Three federal judges sitting together at Kansas City, Mo., on Nov. 25 heard the application of the Kansas City Railways for the Federal Court to take over control of fares and wages of the railway, but not the operation of the system. With that plan of control, the company asks that the court order a fare of 8 cents or two tickets for 15 cents. The fare in Kansas City was raised recently by the State Utilities Commission from 5 cents to 6 cents. As stated previously in the ELECTRIC RAILWAY JOURNAL, the application is based on a recent decision of the War Labor Board that the wages of the Kansas City employees ought to be increased 10 cents an hour and that fares ought to be raised to meet the higher cost.

Essay Contest on Safety First.—To encourage the practice of safety-first principles, the Union Traction Company, Anderson, Ind., will give $30 in gold to employees, for the best papers on the subject "Conservation and War-Time Efficiency." The contest is open to all employees, except department heads, sub-heads and clerks. The paper is to consist of not less than 150 nor more than 500 words. The winners will read their papers at the next "Safety First" get-together meeting, at which time prizes will be distributed. Each local safety committee of the company is to select one of its number as a judge of the contest, and the committeemen thus selected, in conjunction with E. E. Slick, claim adjuster, as chairman, will constitute the board of judges to pass on all articles presented. Papers must be presented before Dec. 6.

Cincinnati Fares Will Go Up.—Fares on the lines of the Cincinnati (Ohio) Traction Company will go to 5½ cents beginning Jan. 1. That was the prediction made recently by Street Railway Director W. C. Culkins. By March 1 the rate may go to 6 cents. The increase in fare will be automatic for three months, under the new franchise ordinance, until the revenues of the Cincinnati Traction Company are sufficient to meet all expenses and create a stabilizing fund of $650,000, after which it will automatically decrease. If the fare is increased tickets will come into use in strips of ten each, at 55 cents a strip. This prediction as to increased fares was made before the War Labor Board's finding in regard to wages was handed down. This award was referred to very briefly in the ELECTRIC RAILWAY JOURNAL for Nov. 23, page 934.

No Opposition to Peekskill Increase.—There was no opposition before the Public Service Commission for the Second District of New York on Nov. 20 to granting authority to the Peekskill Lighting & Railroad Company, Peekskill, N. Y., to charge a 6-cent fare with 2 cents for transfers to the Putnam & Westchester Traction Company, and to the Putnam & Westchester Company to charge 7 cents in Peekskill with 2 cents for transfers. M. S. Decker appeared for the traction companies and the only witness was H. D. Swain, secretary and treasurer of the companies. Mr. Swain filed statements of earnings and expenses showing operations by both companies at a deficit even while one road was temporarily operating under a 7-cent fare. The village did not oppose the petitions as it has amended its franchises to permit the companies to charge what they ask under the petitions. An early decision is expected by the commission. The commission on Dec. 12, 1917, authorized the companies to charge a 7-cent fare with free transfers, but a rehearing was granted upon the request of the village.

Fare Case Before Court.—The fight over 7-cent fares in Lake Charles, La., reached the Supreme Court recently, when the city filed an appeal from the decision of Judge Winston Overton of the District Court on an application of the Mayor and Commissioners for an injunction against the Lake Charles Railway, Light & Waterworks Company. A rule *nisi* was filed by the city against the railway on Oct. 21 and a temporary injunction was granted. On the hearing of the case the city asked for a permanent writ. The temporary ruling was dissolved on the application of the railway, which furnished a bond of $25,000 until there is a final determination of the issues in the court. The appeal of the city states the company is continuing to collect the 7-cent fare and the Supreme Court is asked for a writ of prohibition. The petition states the franchise which was granted on May 22, 1894, gives the city the right to regulate rates and the operation of the company. On Aug. 28 the city fixed the rate of fares at 5 cents. Plaintiffs charge that in defiance of the ordinance the railway began the collection of the increased fares on Oct. 21.

Mount Vernon Acts.—The Common Council of Mount Vernon, N. Y., has adopted a resolution by a vote of seven to three, authorizing the Westchester Electric Railroad and the Yonkers Railroad to charge a 5-cent fare within a well-defined area in that city, with an additional 2-cent fare outside the 5-cent zone as far as Waverly Square, Tuckahee. The new rate would be effective from Dec. 1, 1918, to Dec. 1, 1920. The matter is now before the Mayor. This action is regarded as being not without bearing on the recently rejected petition for increased fares in Yonkers, which adjoins Mount Vernon. On this point the *Yonkers Herald* recently said: "How this proposition, if accepted, will affect the Yonkers situation is a matter of concern locally. At present the fare to and from the New Haven Railroad station from or to Yonkers is 5 cents for a continuous ride. The Yonkers Railroad utilizes the tracks of the Westchester Electric from the boundary line at the Bronx River where Yonkers and Mount Vernon Avenues join. There is no obligation on the part of the Yonkers Railroad to do this except that its contract with the city calls for a 5-cent fare with transfer privilege. The through ride was a voluntary act by both companies."

Atlanta Fare Appeal Renewed.—The City Council of Atlanta, Ga., has referred the renewed appeal of the Georgia Railway & Power Company for permission to increase fares from 5 cents to 6 cents to its committee on freight rates and transportation. It was at first proposed to refer the petition to the special committee of citizens which inquired into the merits of the first appeal of the company for relief, but as this was regarded as almost certain to result in a flat rejection of the increase proposal the Council decided to retain jurisdiction for the present at least. In the case of the original appeal the Railroad Commission held that it was without power to fix rates, but it recommended the advance on the evidence as submitted. The Council dissented from this finding and the increase was not allowed. The Council committee proceeded to its work promptly. Among others it heard Preston S. Arkwright, president of the company, and J. L. McCord, chairman of the people's committee, who presented opposing arguments. Following this the Council committee made up a majority report recommending that the Council table the petition of the railway until a decision is handed down in the case involving the same matter now pending in the Supreme Court.

Personal Mention

P. E. O'Brien has been appointed claim agent of the Springfield (Ohio) Railway to succeed E. B. Gunn.

E. V. Groff has been appointed auditor of the Sioux City (Iowa) Service Company to succeed Elmer Larson.

T. W. Murphy has been appointed master mechanic of the Baton Rouge (La.) Electric Company to succeed A. E. Sommer.

C. O. Griffin has been appointed superintendent of the Rock Island (Ill.) Southern Railway, to succeed J. Munday.

P. B. Nicholson has resigned as purchasing agent for the Rockford & Interurban Railway, Rockford, Ill., to become connected with the Standard Steel Car Corporation, Hammond, Ill., as general manager.

Arthur Clapp, assistant treasurer of the Boston & Worcester Street Railway, South Framingham, Mass., has been appointed auditor and treasurer of the company to succeed A. E. Stone, advanced to the position of general manager of the company.

George Lafferty, formerly private secretary to F. J. Derge, assistant general manager, has been appointed manager of the employment department of the Toledo Railways & Light Company, Toledo, Ohio. Heretofore, department managers have looked after the employment of help for their own departments.

W. L. Locke, formerly resident engineer of the Stone & Webster Engineering Corporation at Seattle, Wash., has been named as vice-president and general manager of the American International Shipbuilding Corporation, with headquarters at the Hog Island shipbuilding plant, near Philadelphia. Mr. Locke succeeds Walter Goodenough.

A. E. Stone has been appointed general manager of the Boston & Worcester Street Railway, South Framingham, Mass. He succeeds C. D. Emmons, who has been made general manager of the Boston Elevated Railway. Mr. Stone has been connected with the Boston & Worcester Street Railway since it was opened in May, 1903, as auditor and treasurer.

C. Nesbitt Duffy is the subject of an extended article in *Cable News-American* of Manila, for Oct. 10, on the occasion of his resignation as vice-president and general manager of the Manila Electric Railroad & Light Company and his acceptance of the position of vice-president of the Visayan Refining Company of Manila. It may interest Mr. Duffy's railway friends to know that the Visayan Refining Company is the largest manufacturer of cocoanut oil in the Philippines and much of its product is shipped to the United States.

C. D. Emmons, the new general manager of the Boston (Mass.) Elevated Railway, goes to that property with a long record of successful undertakings in engineering and management in the Central West, coupled with important achievements in the matter of public relations between the companies with which he has served and the communities based upon the foundation of fairness and amiability. He has been in the East now for two years as vice-president and general manager of the Boston & Worcester Street Railway, South Framingham, Mass., and his selection to the position at Boston is conclusive evidence that the record which he made in the West has been reflected in his management of the

C. D. EMMONS

Boston & Worcester line and will again be reflected in the handling of Boston Elevated matters coming within his province. Mr. Emmons was born in Lafayette, Ind., in 1871. He lived eighteen years in Pittsburgh and was graduated from the Western University of Pennsylvania with the degree of civil engineer. After graduation he entered the service of the Pennsylvania Railroad as a rodman, and was advanced to the position of supervisor of signals for the territory around Philadelphia. In 1900 he was appointed general superintendent of the Lafayette (Ind.) City Railway, and in July, 1903, he was appointed general superintendent of the Fort Wayne & Wabash Valley Traction Company and superintendent of construction of the Ohio & Indiana Construction Company, which was then building the Fort Wayne, Van Wert & Lima Railway. In April, 1905, he was appointed general manager of the Fort Wayne & Wabash Valley Traction Company, which operates 212 miles of line. Under Mr. Emmons' direction two new lines were constructed for that company, the Fort Wayne, Van Wert & Lima Railway and the link between Fort Wayne and Bluffton, which connects with the Indiana Union Traction Company's system. Mr. Emmons also directed the reconstruction of the remaining interurban property of the company as well as the city lines of Fort Wayne and Logansport. From Fort Wayne Mr. Emmons went to the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway, South Bend, Ind., as general manager. He continued with those companies from 1911 until 1916, when he became connected with the Boston & Worcester Street Railway. Mr. Emmons has always taken an active interest in the affairs of the American Electric Railway Transportation & Traffic Association, took much interest in the work of the Central Electric Railway Association when he was in the Central West and is an active member of the New England Street Railway Club.

Charles E. Elmquist, the representative at the national capital of the National Association of Railway & Utilities Commissioners, has been elected president of the association and has also been appointed general solicitor for the state commissions in addition to his former duties as solicitor for the valuation committee of the association and secretary of the special war committee. His office will be a general clearing house at Washington for the state commissions, in obtaining information and in appearing before Congressional committees. The special war committee of the association has been continued, to give attention to after-the-war problems.

John H. Harrington has again assumed the position of division superintendent on the Boston (Mass.) Elevated Railway, succeeding Joseph L. Webber, resigned. Mr. Harrington was for nine years superintendent of Division 7 of the Boston Elevated Railway, which included Cambridge, and from that division he was transferred to Division 2, Roxbury, which was a consolidation of old Divisions 1 and 2. Last June he was made supervisor of transportation in Traffic Manager Dana's office, and from there has returned to the superintendency of Division 3, formerly Division 7. Mr. Harrington has been in the street railroad business for thirty years, starting as a conductor in horse railroad days.

Obituary

J. A. Swanberg, former fuel agent of the Illinois Traction System, with headquarters at Danville, Ill., died a victim of Spanish influenza and pneumonia.

Thomas M. Bradbury, secretary of the State Public Service Commission of Missouri, is dead. He was the first secretary of the commission, and prior to April, 1913, had been secretary of the Board of Railroad & Warehouse Commissioners for several years.

Manufactures and the Markets

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

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Effect of Labor on Reconstruction

Miles of Track and Overhead Will Be in Direct Proportion to Supply of Unskilled Labor

In making plans for the reconstruction market in the electric railway field there are a number of factors not apparent on the surface of things that will exercise a considerable control on the extent to which purchasing is done. The factors to which reference will be made from time to time in these columns include; price of money, price of material and labor supply.

At this time the effect of labor will be considered, for labor perhaps is the controlling factor in all reconstruction.

Present indications are that labor, while it will undoubtedly become more plentiful with the release of men from the army and from strictly war occupations, will not become cheaper for some time. It is much easier to raise wages than to lower them. This is daily becoming more apparent. In fact, the immediate tendency of the stoppage of overtime on a number of government jobs has been to raise the wage rate which the men demand per hour. Otherwise, they figure, their wages at the end of the week will be less than formerly. Labor is becoming uneasy and so nervous that any incautious step towards a wage reduction at the present time might easily excite labor to such an extent as would provoke widespread demonstrations.

Nor is it likely that homecoming of the soldiers will greatly reduce the price of labor. Demobilization will be gradual and the additions to the nation's labor force from this cause will undoubtedly be fully absorbed as they occur.

If labor is to be kept contented, high wages must continue, and furthermore, they must continue even after prices fall. Wage decreases must not precede or even accompany the decline in the commodity market.

The above is written largely as regards skilled labor. With unskilled labor, quantities of which would be needed in any widespread reconstruction movement by electric railways, the situation is even more acute.

In order to rehabilitate the roadbed of a utility, or the overhead system or the distribution system, and these are the parts that have been most sadly neglected in the last five years, unskilled labor is mostly employed. Men who handle the pick, axe, shovel, crowbar, tamper, pike, sledge hammer, etc., are the type referred to. Ordinarily this is looked upon as the lowest kind of labor and consequently is the lowest paid. The war, however, put these men in better classes of work, in places where they earned more money with less physical exertion. It is not reasonable to suppose, therefore, that these men will return to the unskilled work—at least unless something very tempting in the way of wages is offered. An instance is that of a contractor engaged on large work in one of our Eastern cities who is one thousand men short of the number he would like to employ, although he is ready to pay 50 cents an hour.

It is not a new thing to see a class of labor graduate from the unskilled class. Old-time roadmasters have seen different nationalities pass through their hands. But here the people in the unskilled group have been forced to seek better jobs by the incoming peoples of other lands who would work for less money. But now immigration is at low tide. Nor is it to be supposed that European governments are going to sit still and allow such a movement westward again to take place. Besides it is very doubtful if the United States will offer as much in their eyes as the new country of Russia or the devastated regions of France and Belgium which are expected to arise as new countries.

The situation, therefore, is that unskilled labor such as the electric railways is going to need will be scarce and high priced. But there is another factor in this market that must be reckoned with, namely, the railroads. They will need exactly the same kind of labor as electric roads, but will be able to offer better inducements.

Wise superintendents of roads do not make any construction plans without knowing how they stand on labor. In the months to come this factor will become more and more important as the amount of replaced track and reconstructed lines, quantities of which are required, will bear a direct relation to the labor supply.

The Sanford Riley Stoker Company of Worcester, Mass., and the Murphy Iron Works of Detroit, Mich., on Jan. 1, will combine their sales policies in one large constructive organization, it is announced, so as to render the greatest possible service to all clients. Eleven centrally located offices will handle both sales and service for the Riley underfeed stoker and the Murphy automatic furnace as follows: Worcester, Boston, Philadelphia, New York, Pittsburgh, Buffalo, Detroit, Cleveland, Cincinnati, Chicago and St. Paul.

Increased Demand for Change Carriers

Higher Fares Call for Equipment to Handle Pennies—Prices Up $2 a Dozen—Deliveries Good

Since the 6-cent and 7-cent fares for street railways have been granted in a number of sections of the country, there has been an increased demand for equipment to facilitate the handling of pennies. One product that has benefitted as a result of the new fares is the metal change carrier, the demand for which has increased 50 per cent, to take care of the extra pennies. Where change carriers are in use, the manufacturers have provided a new carrier for pennies. This separate penny tube can be quickly attached to the carrier at a small cost.

At the present time more than seventy-five electric railways in the United States and Canada have adopted change carriers as standard equipment.

Wholesale prices to the trade for years have been $18 a dozen, but cost of all materials and labor has advanced to such an extent during the past two years that the manufacturers have had to make an advance of $2 per dozen. The price now quoted is $20 a dozen, $216 per gross f.o.b. shipping point, and by close attention to details in sales and manufacturing the producers hope to maintain these prices. Shipment of a few dozen, as a rule, can be made on the same day the order is received, and gross or half gross lots within a few days.

Standard "D" Coupler

Announcement has just been made by the American Steel Foundries, the Buckeye Steel Casting Company, Gould Coupler Company, the McConway & Torley Company, Monarch Steel Casting Company and the National Malleable Casting Company that they are ready to take their part in the production of the Master Car Builders' Association standard "D" coupler. This coupler became the standard of the association by letter ballot in July, 1916, and represents the culmination of years of painstaking effort on the part of the association and the coupler manufacturers.

The companies above listed state that they have a very complete equipment of flasks, patterns, core boxes, gages, etc., and are now in a position to supply customers with this new coupler in large quantities. The coupler is fully described in a circular jointly distributed by these manufacturers.

New Engineering Firm

Dwight P. Robinson Heads Organization Recently Formed in New York

Dwight P. Robinson, a former partner of Stone & Webster, in charge of their construction and engineering business, has opened offices in New York under the name of Dwight P. Robinson & Company, Inc., constructing and consulting engineers. Associated with him will be R. M. Henderson, in charge of construction; C. W. E. Clarke, mechanical engineer; R. A. Philip and D. L. Galusha, electrical engineers, and M. E. Thomas, structural engineer, together with the nucleus of a strong purchasing, accounting and field construction organization. All of these men, for many years, have been engaged in large undertakings under Mr. Robinson's direction.

In the past they have specialized in the economical and rapid execution of difficult projects, and in the new work are prepared to construct, either from their own designs or from the designs of others, hydroelectric developments, steam-power plants, transmission systems, industrial plants, housing developments, steel and reinforced-concrete structures, the electrification of steam railroad systems, and similar work in this general field. They will also carry on a general practice as consulting engineers, including the making of engineering and financial reports and appraisals.

Mr. Robinson's work runs back for a period of twenty-five years, during which time he has been associated with Stone & Webster, first in the management of some of their electric railway and lighting properties and later, for fifteen years, as president of the construction and engineering branch of the organization. Since 1912 he has been a member of the firm. He is a graduate of Harvard University and the Massachusetts Institute of Technology.

Mr. Henderson was with the Stone & Webster organization for the last twelve years, three as district manager at Chicago, and has had extended experience in construction. Mr. Clarke, also from the same firm, has been intimately connected with or responsible for such stations as the new steam plant of the Buffalo General Electric Company, the South Boston plant of the Boston Elevated Railway, the Fisk Street plant of the Commonwealth Edison Company, Chicago, the Yonkers plant of the electric zone, New York Central Railroad, and more than thirty others of various capacities.

Mr. Galusha has been working under Mr. Robinson's direction for twelve years, and some of his best-known work has been done as electrical engineer in charge of the Mississippi River power development at Keokuk, and the Minneapolis General Electric Company's recent steam station. Mr. Thomas's structural experience has been extensive, including the superstructure of the power station surmounting the Keokuk dam, the concrete structural work of the new buildings of the Massachusetts Institute of Technology, and the design of numerous steel unit warehouse buildings and shop buildings fabricated in America and shipped to France for the American ordnance base depot. Mr. Philip's association with Mr. Robinson began eighteen years ago, when he was electrical engineer of the Seattle Electric Company, which was then under the management of Mr. Robinson and has continued without interruption. His special field is that of consultant on electrical engineering matters.

Adequate financial resources and connections, according to officials of the company, assure its ability to handle operations of any magnitude.

Observations on Current Market

Limited Quantity of Trolley Wire Available—Small Shipments of Rails Now Being Made

While the market for electric railway material is still quiet there is much optimism. Observations made this week by a representative of the ELECTRIC RAILWAY JOURNAL are interesting with regard to trolley wire, rails and rolling stock.

There has been practically no purchasing of trolley wire except for replacement purposes during the past three years and manufacturers are now marking time awaiting the government's decision on what the basic price of copper shall be after Jan. 1.

While there is some supply of trolley wire available it is in limited quantity and shipments are being made in three to four weeks. Foreign buyers are said to be in the market for a considerable quantity for France, Belgium and Japan and the opinion is expressed that this demand may stimulate prices. A representative of one of the largest concerns stated on Wednesday that he expected the demand for home use to begin to show betterment in the next three months.

Small quantities of light Standard T-rails are beginning to be delivered now, pro rata on back orders that have been on manufacturers' books for many months, and inquiry on new business for rails has shown a marked increase the last week.

These small deliveries are made up from the customary lots of tonnage left over on former rollings but until recently not released by the government for shipment. The situation for girder rails still remains doubtful and uncertain.

The rolling stock market shows a little more activity and a representative of one of the more important railway car equipment houses ventured the opinion this week that he was very optimistic and hopeful of the electric car situation and expected considerable buying in the next two or three months, both in this country and for Canadian account.

Export Restrictions Relaxed

Large Number of Items Taken Off Conservation List, Including Many in Railway Lines

On Tuesday of this week the War Trade Board announced that several hundred commodities were removed from the export conservation list, effective immediately. This follows closely on an announcement by the board made several days ago to the effect that while the signing of the armistice made possible the exportation of many articles not now needed for war purposes, for some time to come government control of certain commodities of which there is a general world shortage must continue. It was announced, however, that licenses would be granted "as freely as possible."

Included in the various lists of articles removed from the export conservation list are the following of interest to the electric railway industry: Railway cars, completely assembled and unassembled and parts thereof; iron and steel track bolts, frogs and switches, rails 50 lb. per yard and less and splice bars, steel railroad tie plates, iron and steel poles, iron and steel railroad spikes.

Bituminous Storage Limit Off

All storage restrictions on bituminous coal were removed on Nov. 22 by the United States Fuel Administration in conformity to the action of the War Industries Board in cancelling its preferential industries list. Anthracite coal is not affected, however, by the ruling of the Fuel Administration. Every industry and every householder in the country now may store as much bituminous coal as desired or obtainable, as the action of the War Industries Board removes the necessity for the Fuel Administration to distinguish longer among different classes of industrial plants.

The restrictions just raised provided for the accumulation by the consumers in the preference classes defined by the War Industries Board, of reserve stocks of bituminous coal, in accordance with their location in relation to various mine fields and their classification on the preference schedule. All industries located farthest from distribution points, particularly those in New England and in the Northwest, are found not only to be well stocked, in accordance with Fuel Administration specifications, but in many cases have surpluses above those amounts.

During the war practically all manufacturers of Diesel and other oil engines have been occupied in constructing submarine equipment. These manufacturers, it is reported in the *Electrical World*, are now getting ready to launch a selling campaign among the central stations and among the industrial plants and mines that use prime movers of moderate size.

Franchises

Paducah, Ky.—A. S. Nichols, manager of the Paducah Traction Company, recently placed before the City Commission of Paducah a new franchise ordinance which he is endeavoring to have adopted. Under the terms of the franchise the company would be permitted to discontinue any line that failed to prove profitable; would no longer be forced to maintain streets inside of its tracks and for 1 ft. each way, and would be permitted to keep the franchise alive by operating a car over any line once in ten days, instead of losing $20 for each day that a car is not operated over a line at hourly intervals.

Track and Roadway

Home Electric Company, Eureka Springs, Ark.—The Home Electric Company has been organized for the purpose of purchasing the properties of the Eureka Traction Company and the Eureka Springs Electric Company, which own the electric railway, electric light plant and ice plant in Eureka Springs. The board of directors is as follows: B. H. Blocksom, F. A. Butt, C. A. Fuller, F. C. Walker, Fred Cook, William Kappen and P. L. Smith.

Los Angeles, Cal.—The Board of Public Works of Los Angeles will soon receive bids for the construction of a double-bore tunnel, lined with enameled brick and tile, paved with asphalt, having large concrete approaches and carrying two car tracks. About $1,500,000 is available for this work. H. B. Ferris, secretary.

Municipal Railway of San Francisco, San Francisco, Cal.—The Board of Works recently requested permission of the Board of Supervisors to be allowed to purchase the necessary materials for rebuilding tracks of the United Railroads in the Parkside district. These tracks are to be used by the Municipal cars giving service through the Twin Peaks tunnel. The board also asked to be allowed to buy the material required to connect the Ocean Avenue line of the United Railroads with the city's tunnel line so that the municipal cars can give service to the Ingleside and Westwood Park districts. These expenditures are in conformity with the arrangement made between the city and the United Railroads for the joint operation of street car tracks west of Twin Peaks.

Lincoln (Ill.) Municipal Railway.—The City Commission of Lincoln has determined to build an extension of the Lincoln Municipal Railway to the North Mine and a resolution favoring such construction has been placed on file. The work will not be started until the reconstruction of the Union and Eighth Street track is completed. The track to the North Mine will be laid on the west side of the street, paralleling the pavement, the City Commission saving the expense of tearing up the pavement.

Gary (Ind.) Street Railway.—An extension is being built by the Gary Street Railway to its present Fifth Avenue line along Buchanan Street to the American Sheet & Tin Plate Company works. The northern end of the line will connect with a 1½ mile extension being built by the sheet and tin plate company into its works. This extension will be leased to the Gary Street Railway.

New York (N. Y.) Municipal Railway.—A letter has been sent by the Public Service Commission for the First District of New York to the Board of Estimate & Apportionment, stating that the commission proposes to push the letting of contracts for the remaining portions of the dual system, reaching agreements where necessary, with present contractors, that will secure prompt completion of lines that are not yet ready for operation. This action was recommended by Commissioner Travis H. Whitney, after conferences with the Priorities and other federal boards in Washington last week. These conferences were sufficiently favorable to indicate that steel and other material would now be available, and that the national government now desires to have public work pushed, in order to aid in the demobilization of war industries. In keeping with this motion, the commission has transmitted to the Board of Estimate four proposed agreements with the Degnon Contracting Company, under the general provisions of the Lockwood law, whereby the remaining work is to be done on a cost basis upon the four contracts which the Degnon Contracting Company now has.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York recently stated that the plans for the extension of the Queensboro subway from Grand Central Station to Times Square are not yet completed, but that the work is being pushed as rapidly as possible. Some difficulty is being encountered in perfecting the plans, because of the grade between those two points, and also in locating the proposed station in the neighborhood of Fifth Avenue. According to Assistant Secretary Robinson, it is probable that forms for bids will be taken up as soon as possible now that the government has lifted the ban on such materials as are needed in the construction work. At the best it is probable that it will be more than a year before the extension is in operation.

Dallas (Tex.) Railway.—Extensive improvements to the electric railway lines of Dallas are to be made by the Dallas Railway as soon as materials can be purchased under the lifting of restrictions placed on such work by the War Industries Board. The company, under the terms of its franchise, is required to make extensive improvements and betterments. These have been held up by the war, but now that the end is in sight and restrictions are being lifted, the company is planning to go ahead with their improvements as rapidly as possible. The company has on hand a large amount of steel rails ordered before the United States entered the war, and these will be used in the first new lines to be built and in relaying steel on lines that must be so improved. According to Richard Meriwether, general manager, the company will begin at once with the relaying of the tracks on Main Street from Haskell to Peak so this portion of the street may be paved as ordered by the City Commission. The paving of Jefferson Avenue in Oak Cliff from Lancaster to the city limits has also been ordered, but held up on account of the war. This will be carried out at once, and will prove one of the biggest improvements for the traction company, as more than 2 miles of street must be laid with new and heavier steel and paved.

Chicago, Milwaukee & St. Paul Railway, Seattle, Wash.—R. Beeuwkes, electrical engineer of the Chicago, Milwaukee & St. Paul Railroad, reports that the electrification of the company's line from Othello, Wash., to the Pacific Coast is nearing completion, and operation by electric power will commence during 1919.

Power Houses, Shops and Buildings

Humboldt Transit Company, Eureka, Cal.—A report from the Humboldt Transit Company states that it has purchased a 300-kw. rotary converter. The company intends in the future to use alternating current purchased from the Western States Gas & Electric Company. Its other equipment will be for sale in the near future.

Portsmouth, Dover & York Street Railway, Dover, N. H.—Fire recently damaged the carhouse and power plant of the Portsmouth, Dover & York Street Railway at South Berwick Junction to the extent of $5,000.

Shamokin & Mount Carmel Transit Company, Mount Carmel, Pa.—The power plant of the Shamokin & Mount Carmel Transit Company at Green Ridge will be abandoned in the near future and energy will be supplied by the recently consolidated Pennsylvania Lighting Company at Shamokin and Edison Electric Illuminating Company at Mount Carmel, purchased by Chandler & Company, Philadelphia. An electric transmission line connecting the Shamokin plant with the Mount Carmel plant and with the plant of the Shamokin & Mount Carmel Transit Company is nearly completed and preparations are being made by the power company to install additional machinery at its station in the western part of Shamokin.

Philadelphia (Pa.) Rapid Transit Company.—A contract has been awarded by the Philadelphia Rapid Transit Company to H. E. Baton, Philadelphia, for altering and repairing its shops at Forty-ninth Street and Woodland Avenue at a cost of about $45,000.

Montreal (Que.) Tramways.—Contracts have been awarded by the Montreal Tramways for repairs and extensions to its carhouse at Vitre, de Fleurimont and St. Antoine Streets.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—Plans have been prepared by the Puget Sound Traction, Light & Power Company for reroofing the company's lighting station at 4237 Seventh Avenue, recently damaged by fire. The roof will be entirely of concrete and steel, and will cost about $10,000.

Rolling Stock

Kansas City (Mo.) Railways has bought ten new one-man cars from the National Safety Car & Equipment Company. The cars will be built by the Cincinnati Car Company.

Trenton & Mercer County Traction Corporation, Trenton, N. J., announces through Rankin Johnson, president of the company, that it has secured six new modern cars for the Trenton and suburban service and will place them in commission some time in January. The Board of Public Utility Commissioners of New Jersey requested the company to install five new cars by next April and President Johnson had to confer with war work officials at Washington before he could secure the cars. The cars are promised for delivery within thirty days.

Trade Notes

Capital Traction Company, Washington, D. C., has adopted the International cash registering box for use on its cars.

Ohio Brass Company, Mansfield, Ohio, has moved its New York office from 30 Church Street to 1781 Hudson Terminal Building, 50 Church Street.

Thornton Trolley Wheel Company, Ashland, Ky., capital $250,000 was recently incorporated by Frederick Thornton, T. M. Adams, P. M. Scott and others.

Union Switch & Signal Company, Swissvale, Pa., announces that on and after Dec. 1 the New York office of the company will be located in the City Investing Building, twenty-first floor, 165 Broadway.

A. G. Chapin has been appointed New England manager of the National Conduit & Cable Company, Inc., and the National Brass & Copper Tube Company, Inc., with headquarters at 200 Devonshire Street, Boston, Mass.

United Railways & Electric Company, Baltimore, Md., has purchased 1,000,000 metal tags to be used in lieu of coins. These tags were purchased from the National Railway Equipment Company and will be sold at designated places.

F. Y. Stewart has been appointed manager of the tape department of the United States Rubber Company with headquarters at the company's main office in New York. Mr. Stewart was formerly manager of the Walpole Tire & Rubber Company from the time it was bought and finally absorbed by the United States Rubber Company about three years ago. The Walpole friction tape is now manufactured, sold and distributed by the various branches of the United States Rubber Company in the principal cities of the United States.

New Advertising Literature

W. S. Barstow Company, Inc., New York, N. Y.: 1918 manual of securities of the companies in which it is manager or is interested. Maps accompany the descriptions of most of the properties. The book is uniform in size with the handbooks of the same kind published by Stone & Webster.

Safety Car Devices Company, St. Louis, Mo.: Pamphlet with thirty-six pages and cover containing a reprint of part of the issue of the ELECTRIC RAILWAY JOURNAL for Sept. 28, descriptive of the use of safety cars, also the announcement made in the same issue by the Safety Car Devices Company. The pamphlet is printed in two colors.

Economy Electric Devices Company, Chicago: Circular on Vulcan one-man kerosene furnace or torch. A list of the uses for which this furnace is adapted in the shop and on the line is given. Views are also presented of the way in which it may be used for loosening frozen brakes, for thawing out an air line, for thawing out a triple valve, for preheating a rail preparatory to acetylene bonding, and for thawing ice and snow from interlocking.

Oxweld Acetylene Company, New York, N. Y.: A book entitled "Oxwelding and Cutting," which describes the different operations necessary for this class of work and takes up fifty-four problems that it is desirable for an experienced operator to master. The book is a manual of instruction for the shopman doing welding and cutting and should prove very beneficial in promoting better workmanship, through a more intimate knowledge of the welding principles and their proper application.