

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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How Far Does It Pay to Cut Expenses?

ON MANY an electric railway property it has been necessary to reduce expenses almost regardless of the results, and even to refrain from making expenditures which would have earned the interest rate several times over. Such procedure has "gone against the grain" with the thrifty manager who realizes that he or his successor must pay for this enforced parsimoniousness in the long run. Of what use is it to offer a man a 25 per cent investment if he has no money or credit? Many a railway has seemed to be in this position during the past few years.

Nevertheless, there is a limit to which expenses can be cut if a road is to be kept operating at all. If track and equipment are allowed to run down, sooner or later the earning capacity of the property is impaired. Either the railway physically will not be able to carry passengers or people will not want to ride on account of the shabbiness of the cars and the discomfort of travel. Therefore, before any more requests for maintenance or more service are turned down such questions as these demand answer: Have all possible economies in maintenance and in conducting transportation been located? Does the public which is holding down the fare fully understand the situation? Have all available means for securing new business been considered? Will the proposed curtailment seriously impair the service now and later? Have the best brains on the property and within reach elsewhere been exercised to the limit in trying to answer such questions as these?

The making of drastic cuts may be the only thing to do in some cases, but there is talent enough in the industry, financial, managerial and technical, to render the cuts less necessary if this talent is utilized 100 per cent. And this does not imply disparagement of the splendid results that have been and are now being achieved.

Route Vehicular Traffic to Avoid Main Intersections

IN MANY smaller cities the intersection of the main north-south and east-west thoroughfares is at the center of the business district. These two streets are usually occupied by the main street car lines and they also serve as the principal lanes of automobile and other vehicular traffic, thus focusing nearly all of the city's traffic at one point of intersection. This results in a bad congestion which should be corrected to the advantage of every one. It can be done simply and readily in almost every case with the co-operation of the police department if all through vehicular traffic is detoured one block to the right at the first corner before reaching this main intersection. This would clear the main intersection of practically all but the street car traffic which cannot be readily rerouted, would speed up materially the street car service through this intersection,

would make the crossings much safer for pedestrians, and would very greatly help the rapid movement of automobiles through the downtown section.

The scheme would mean a two-block square in the center of the city, inside of which there would be only street car and pedestrian traffic, and around which automobile traffic would travel as it does around the circles in Washington. The total number of intersection movements occurring formerly at the one point would be divided between four points in a manner which would eliminate all holding of one-direction traffic while permitting the other-direction traffic to pass. This same scheme could also be used effectively in large cities to alleviate congestion at various outlying heavy-traffic intersections which are of much the same character as the one main intersection in a smaller city. The merchants located within the square would probably object, but the harmful effect on them would be questionable, while the advantage to every one else would be real and apparent.

Railway managers should make periodical speed observations on all sections of their lines where there is much congestion, and it is safe to say that if this is done startling results will often be obtained. Car-hours will pile up rapidly on an obstructed street, and in that case the thing to do is to appeal to the authorities for relief.

Adjusting Service as Traffic Changes

A CERTAIN railway company was operating three-fourths of its cars over the full length of a route and the remainder of the cars were turned back about three-fourths of the distance out. Traffic surveys showed that the interests of the riders on that line would be better served and thousands of car-miles saved annually if 50 per cent of the cars were turned back at a point midway between terminals. This recommendation was made to the management, but was not acted upon because there was no crossover at the street where it was proposed to "short line" part of the service.

Here is an instance of short-sighted economy which unfortunately is too common among railway men. A system is laid out originally with crossovers and other special work placed for the existing needs of service. In course of time the riding habit of patrons of the various routes changes and common sense indicates that the service should be graduated to meet their demands. Here comes the question of installing some new special work at a certain cost or of wasting that much or more annually in unnecessary car mileage.

It is one thing to have the defects of a system pointed out and another thing to act upon them. There is a field for traffic study on every railway property, and the deficiencies are usually more readily apparent to a trained expert who comes on to the system with a fresh viewpoint, free from operating responsibilities and with no local prejudices. Such an engineer will con-

sider the traffic characteristics of a line and determine whether there is any excess or shortage of service on the system as a whole or on any of its parts. He may find that seats exceed passengers even in rush hours and the natural remedy would be curtailment of service. Some lines will be found with slower speed than others, and if this is not due to more short-haul riders or a greater number of traffic interferences, the schedule should be shortened. Excessive layover time may be found and if this is not called for by contract with the employees, the pruning knife of the time-table maker should be applied. Some long lines may be found overlapping shorter ones, and again the traffic engineer might suggest elimination of duplicate service.

There are so many angles to be considered in the revision of schedules, however, that the railway executive is at times justified in "hastening slowly" even on the recommendations of a traffic expert. Local conditions have to be weighed seriously. Too sudden a shifting of service, even though warranted from the company standpoint, may not be good policy. The changes are more likely to "stay put" if they are made more slowly and thus not arouse public resentment. This does not mean that the company should mark time indefinitely while a real sacrifice of costly car-hours continues. Wasteful service will benefit no one, and the careful operator will know when and where to suit his facilities to the demands of the riders. This is the test of good judgment.

Is Public Ownership of Utilities Inevitable?

THAT it is, was the conclusion reached by an eminent engineer in a paper recently presented at a society meeting. Many good reasons were given to show that this is the logical outcome of present conditions. Thus the fact was pointed out that the rates and consequently the receipts of the companies are absolutely controlled by the authorities, while the expenses are also very largely determined by them or by circumstances over which the utility has no control. With service at cost, which is now coming into more general use, the argument perhaps is even stronger, and the author of the paper mentioned pertinently inquired what is the use of the stockholders when all business risk has disappeared. Why not simplify the relationship by having public management function direct? he asked.

Undoubtedly private ownership in such circumstances is somewhat of an anomaly. Its excuse is that public ownership of utilities under the political conditions which exist in most of our cities is still more of an anomaly. The fact is that the American municipality is not organized to conduct a commercial enterprise efficiently. The city fathers, as a rule, are not chosen for their business sense but for their ability to get votes. These two qualities rarely go together. But even if the business knowledge of the average city council and mayor was adequate to the task, if they agreed to discard politics in their management of the property, and if they had the courage to carry out such a program, there would still be the fatal weakness in municipal operation of frequent change in administration.

Service at cost, although it may have its drawbacks in the way of reduced incentive, has its continuous administration which can be kept keenly attentive to its work by the city transit administration. There are thus

two interests, the railway and the city executive, watching each other, so that there is far less likelihood of the utility failing to do all it can than if the business was conducted by the city officials only, with no one with sufficient interest or authority to watch what they were doing. Finally, there is far less opportunity for politics to influence a private management, practically irremovable during good behavior, than a political management dependent for office on popular vote every two or more years.

Private ownership and operation may have its defects in the way of efficiency and economy, but that of the public would be much worse.

Cash from Casuals, Tickets from Regulars

A COMPILATION recently made by the statistical department of the American Electric Railway Association shows that in 1920 fifty-seven cities with a population of 25,000 or more were charging a 10-cent base cash fare, as against only twenty-five in 1919 and none in 1918 or 1917. The number of cities with other fares higher than 5 cents were as follows: Six cents in sixty-one, 7 cents in eighty-nine, 8 cents in twenty-three and 9 cents in four. The compilation also shows a considerable increase in the number of companies in cities above 25,000 population which are selling tickets at a lower rate than the single cash fares. These cases are especially numerous where the cash fare is 7 cents or more. The tendency toward a 10-cent fare is especially marked in the eastern part of the country, while that toward a ticket rate applies to all sections. The ticket rate generally has not been put in as a reduction over a previous cash rate but at the time that the cash rate has been increased, and its purpose evidently has been to make the increase more acceptable to the frequent rider.

One great advantage of the 10-cent fare, whether accompanied by the ticket plan or not, is that a single coin or token may be used to pay the fare. This is an advantage for both passenger and company. In fact, it was to retain this advantage that so many companies held on to the 5-cent fare long after it became inadequate. The single coin is a time saver both to the conductor and the passenger, and as the 10-cent coin is the one of the next higher denomination to the 5-cent nickel it possesses obvious advantages from this point of view.

The principal argument against the 10-cent fare for a uniform fare is of course its amount and the extent to which it may discourage traffic, particularly the short-haul business. It is not the purpose here to discuss the relative merits of flat fares versus zone fares for urban service to stimulate short-distance riding, but the question of tickets and cash fares in a property which has a flat fare. For such conditions many companies favor the 10-cent fare and believe that the benefit of any reductions should go to the frequent rider through the establishment of a ticket rate. Such a plan makes the casual customer and the stranger pay the higher retail rate, whereas the regular user gets the discount usually accorded to wholesale purchasers in other lines of business. Another advantage of the ticket rate is that it allows changes of small percentage in the rate, either up or down, by a change in the number of tickets sold at a stated price.

The new plan of the Boston Elevated Railway now

being tried in Malden and Everett carries out the policy outlined so far as the single coin fare is concerned because 5 cents will be charged for the local suburban ride, while 10 cents will be charged for the long urban ride into Boston.

More Business for the Interurbans

MORE business requiring more car-miles of service and resulting in better car-mile earnings is what is most needed by the interurban railways. But how can it be had?

More business can be secured if a company is prepared to go after it determinedly with the kind of service that is wanted. This means prompt and efficient freight service and fast, comfortable passenger service with a very great extension of through runs. The matter of service is now more important than ever because the steam railroads, faced with a tremendous falling off of both passenger and freight haulage, are going to almost any ends to secure business. This applies particularly to the freight business, where it is always possible to make offers of service more attractive to shippers than given heretofore, and to make good on such offers during dull times. This points to the absolute necessity for the electric freight carriers to be very much "on their toes" in keeping the service up to a high order of excellence for present patrons, and in waging a very energetic campaign for any new business in sight. In other words, the competition of the present time is extremely keen, and it can be met only with a traffic department that is wide awake and backed up by an operating department well aware of the kind of service it must deliver to meet the situation.

Cultivation of the farmers is productive of a good quantity of profitable business. The farmers of Indiana wanted electric freight service badly enough to secure passage of a bill permitting the interurbans to haul livestock through the streets of any city. The service which the electric lines can give the farmer saves him money through substantial reduction in shrinkage of stock. This kind of business, together with all of the sugar-beet, garden produce and dairy product shipments that may be secured (and best secured by encouraging the building by the farmers of community sidetracks) makes a total of freight tonnage well worth going after. Little informal way-station meetings of an official of the company with a group of farmers, serving to give the latter an intimate contact with the company and an opportunity to voice their needs and petty complaints, are of wonderful value in winning friends for the company and incidentally business.

Special attention to through train service as a means of increasing the passenger business is worthy of consideration. Two recent efforts along this line will show in

fewest words what can be accomplished. Two new fast through trains between Indianapolis and Fort Wayne recently inaugurated were carrying seventy-five passengers a day each way in less than thirty days, and it soon became necessary for the cars to haul trailers. During the first forty-five days of operation, only three trains were late. The cars are cleaned inside and out at each end of the trip, as with the treatment given in the yard service of the Pullman cars. The character of service undoubtedly had a great deal to do with the success attained. More recently the through service inaugurated between Indianapolis and Louisville, with fine new cars running on a fast schedule, has met similarly with almost immediate success.

These are just a few of many things that are available for interurban lines to do to improve their financial conditions. It is not as though there were nothing left to do. The main point is to get busy and set aside the old obstacles that have been permitted for years to stand in the way. If there is determination, it will be found that most of these obstacles are not controlling.

Take Up the Slack in the Railway Industry

MR. HOOVER was the logical man to head an investigation into the causes of industrial waste. His regulations during the war, exemplified by his call for a "clean platter," taught the public the evils of waste, and it is notable that the first extended undertaking of the Federated American Engineering Societies under Mr. Hoover's direction should be to study the causes and attempt to reduce the waste in industrial undertakings. There are many of these causes of industrial waste. They include unemployment, failure to secure maximum output from the individual due to misfit or other cause, lack of standardization, mismanagement, failure of industries to co-ordinate, and so on. All of these are being studied in ten representative industries by the Federated Engineering Societies to see what relief can be obtained.

The electric railway industry should profit directly and indirectly from this investigation—directly from the lessons which will be derived, indirectly because in periods of business stress its traffic falls off, since the

public does not have the money to spend on car-fares. The benefit to the nation of having all its productive energies utilized, or with even half of the present waste eliminated, should be tremendous. Waste is the biggest tax the nation has to pay, and it is hard to imagine anything which would add more to our national prosperity than greatly to reduce the size of this tax.

The railway industry will be prepared to do what it can to co-operate when the report of this committee is rendered. In the meantime causes of wastes where detected should be removed in the general interest.

Quotation from the Federal Electric Railways Commission Report

No. 14

THE commission is unanimous on this point: That there has not been sufficient experience with public ownership and operation of street railways in this country to enable us to recommend it as a permanent solution of this problem. In some of the foreign countries it has apparently worked well. We do not believe under present conditions that this method of operation would be successful in most of the cities of the United States today.

We are certain that much can be accomplished by private initiative, stimulated and aided by thorough public regulation; that the final solution could, in many communities, be found under private management, and that in any event, the reforms which have been urged by the commission should be instituted, since those reforms would serve to place the relations between the street railway and the public upon a more just and equitable basis.

Living Costs and Wages

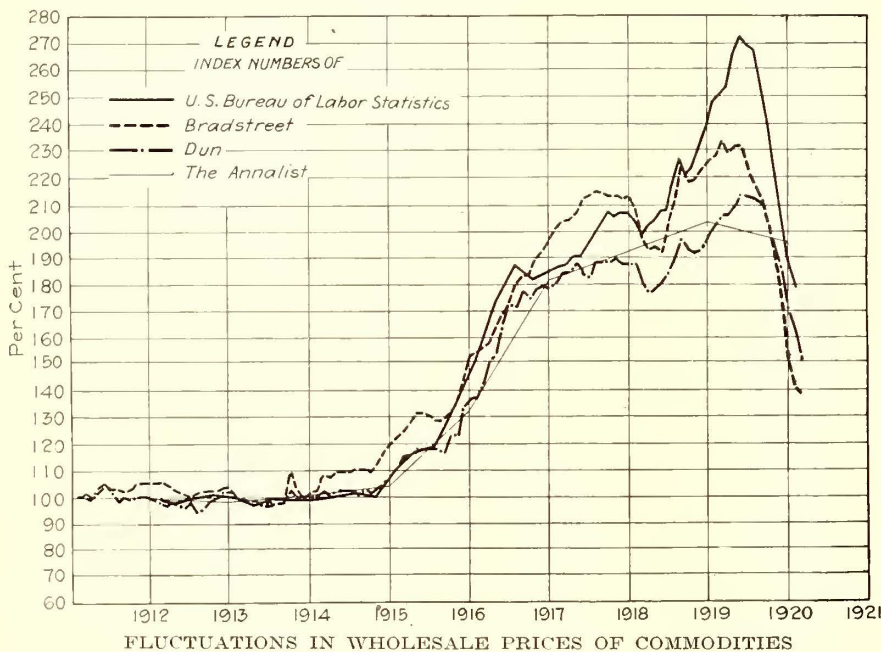
The Standard Index Numbers Are Charted by Months for the Period Beginning Before the War and Show a Marked Falling Off in Prices Since the First Half of Last Year—
Figures Are Also Given for Wages and Unemployment

By JOHN F. LAYNG

Member of the Firm of Hemphill & Wells, Consulting Engineers, New York

NEARLY every newspaper now contains some reference to wage reductions, decreased living costs and the financial embarrassment of the local traction system. The question naturally comes up, what can we find out about these things which are a matter of universal concern? Let us consider, first, the street railway situation. This can be understood in a few minutes, if we have the company's operating report. Very few of these companies have been meeting their capital obligations. Many have not had sufficient in-

raw and manufactured textiles, metals, coal and coke, mineral and vegetable oils, naval stores, building materials, drugs and chemicals, and miscellaneous articles. The wholesale price per pound of each article is listed and the totals added. The grand total is Bradstreet's Price Index Number. If the figure for Jan. 1, 1912, is taken as 100 per cent, the wholesale high level price during the recent abnormal period was 233.1 per cent, this being on Feb. 1, 1920. On April 1 prices had dropped to 231.4 per cent, but on May 1 prices were 231.6 per cent. Since that time they have declined very rapidly and on Feb. 1, 1921, they had receded to 138 per cent. The various fluctuations month by month from 1912 to the present are shown graphically in the chart on this page.



come to pay operating charges, the deficit being made up by borrowed money and deferred maintenance.

The reason for so many unfavorable operating reports is the abnormal increase of labor and material costs within recent years without a corresponding increase of income. It is the purpose of this article to show the extent of this increase and the present trend of these prices.

There are definite and reliable guides of the trend of retail prices on which we can base our judgment. These are the index price numbers of the five leading authorities in this country, which are Bradstreet, Dun, the Annalist, the United States Bureau of Labor Statistics and the National Industrial Conference Board. Each of these will be considered individually.

BRADSTREET'S INDEX PRICE

Bradstreet takes the wholesale prices of ninety-six basic commodities, which are supposed to be representative of average price conditions in trade. These articles include breadstuffs and other foods, live stock,

goods in the wholesale markets at the specified dates. Through the use of a per capita consumption factor in this index number, wide fluctuations in an article little used do not materially affect the total, whereas changes in the great staples have a larger bearing on the general result. The per capita consumption multipliers used do not change with the varying prices. If Dun's Index Number of January, 1912, is taken as 100 per cent the highest wholesale prices were reached in May, 1920, when the value was 213 per cent of the January, 1912, prices. Since then prices have continually dropped, until in February, 1921, the value was 150 per cent.

THE ANNALIST INDEX PRICE NUMBER

Wholesale quotations of twenty-five food commodities are used as the basis of this index number, the articles being so selected as to represent a theoretical family food budget. The prices used are New York and Chicago quotations. The index price number is obtained by computing the simple arithmetical mean of the relative prices of the different commodities.

DUN'S INDEX NUMBER

Dun's Index Number has the scientific foundation of a proper regard for the relative importance in per capita consumption throughout the country of each of the many articles used in its compilation. On the business day nearest to the first of every month about 300 wholesale quotations are taken, and these are separately multiplied by a figure determined upon as the estimated per capita consumption of each of the many commodities embraced by the record. The results are then grouped under seven heads, the total of all representing the actual cost of a given quantity of

These figures, considered on year averages with 1912 as 100 per cent, showed the 1919 wholesale prices to have advanced to 203 per cent. The highest average price for any single month was in June, 1920, when the figure was 231 per cent of the 1912 prices. The average for 1921 up to Feb. 19, 1921, was 135 per cent of the 1912 figure. Year averages are given in the chart.

UNITED STATES BUREAU OF LABOR STATISTICS
INDEX PRICE

The wholesale price of more than 300 commodities are used as the basis of this index price, the quotations being principally at New York and Chicago. No attempt has been made to weigh the index number. Instead, it has been thought best simply to use a large number of representative articles, selected in such a manner as to make them to a large extent give the time value of price fluctuations in basic commodities.

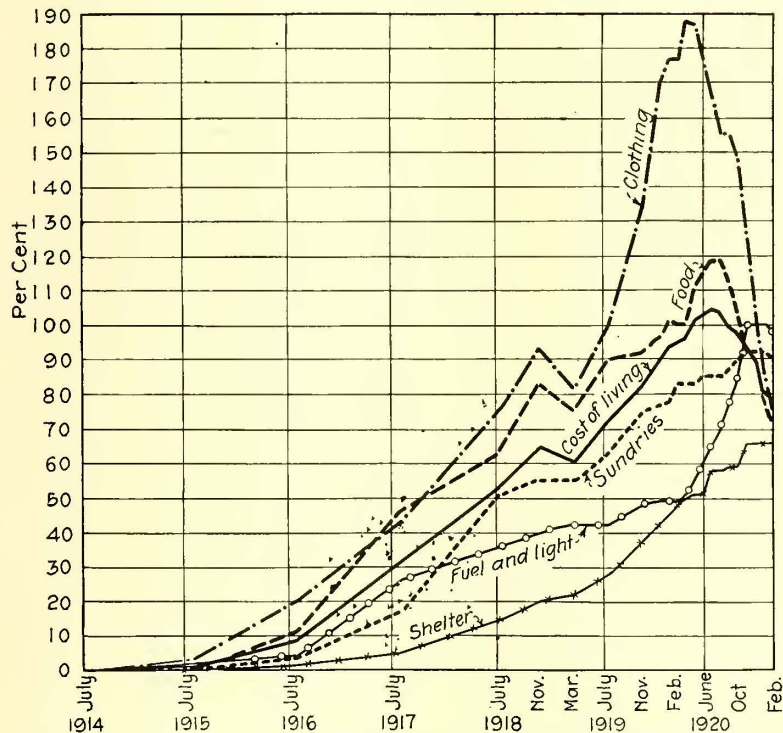
NATIONAL INDUSTRIAL CONFERENCE BOARD

One of the important activities of this board is an investigation of living costs. One fundamental difference between its index number and those of Bradstreet,

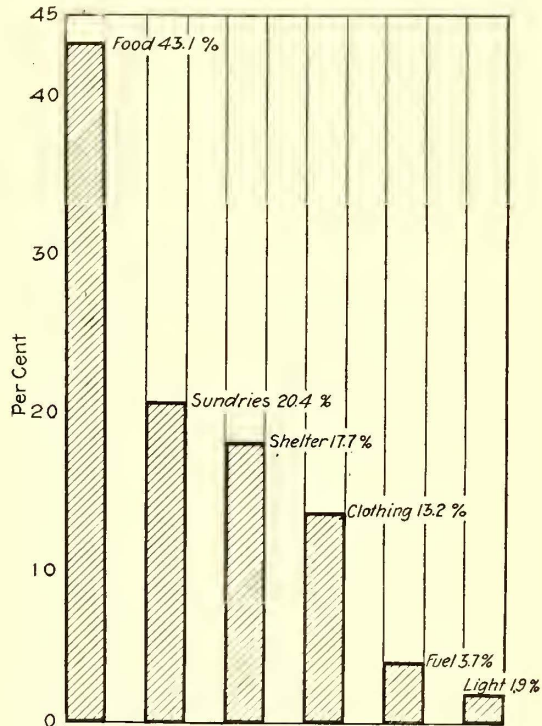
of the retail prices for food, shelter, clothing, fuel and light, and sundries, weighted in the proportion which these have in the budget of an average family.

The food prices are obtained from the Statistical Bureau, United States Department of Labor. Clothing prices are based on data secured direct by the board from wide sources of information in various parts of the country. Prices for fuel, light, shelter and sundries are secured in the same manner as clothing prices. "Sundries" include carfare, doctors' fees, church contributions, organization dues, insurance, medicines, reading material, amusements, furniture, household supplies, candy, soft drinks and tobacco. The figure taken as the relative importance of these articles in the average budget is food 43.1 per cent, sundries 20.4 per cent, shelter 17.7 per cent, clothing 13.2 per cent, fuel 3.7 per cent, and light 1.9 per cent.

These figures and their total are shown graphically in the second chart. In this chart July, 1914, is taken as zero and the peak of retail prices will be found as having been reached in July, 1920, when the figure was 104.5 per cent above that of July, 1914. Since that time prices have been rapidly going down, and on the same



FLUCTUATIONS IN COST OF LIVING IN THE UNITED STATES AS REPORTED BY NATIONAL INDUSTRIAL CONFERENCE BOARD (PERCENTAGE ABOVE THAT IN 1914)



RELATIVE PERCENTAGES OF EXPENSE ITEMS COMPRISED IN THE AVERAGE FAMILY BUDGET

Dun, the Annalist and the United States Bureau of Labor Statistics is that the board bases its figures on retail prices rather than wholesale prices.

The relation of wholesale prices to retail prices is similar in many ways to the relation of retail prices to wage rates. There is a lag between the raising and lowering of wholesale prices and the reflection of this change in retail prices. Furthermore, retail prices are more a matter of personal selection than wholesale prices. This phase must be considered in any conclusion based on wholesale prices.

Another point of difference between the index figure of the National Industrial Conference Board and the other index figures mentioned, except Dun's, is that it represents a weighted average. The figure is made up

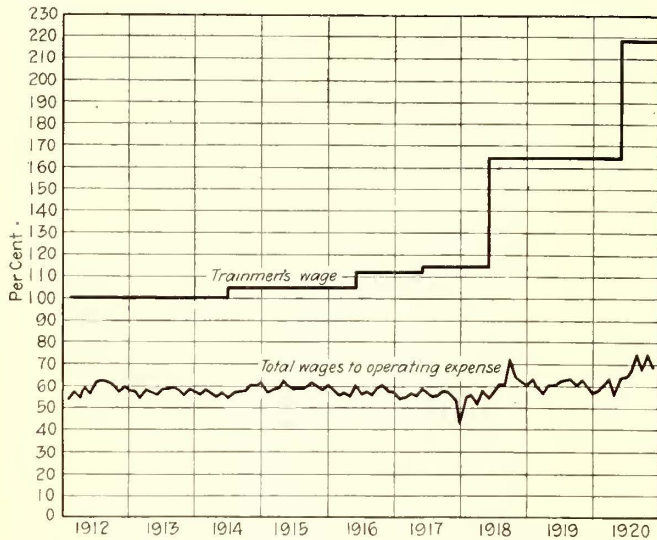
basis as that just quoted the prices as of February, 1921, are 76.3 per cent.

The graph of costs of the National Industrial Conference Board shows that the principal reduction in living costs during recent months has been in food and clothing. Up to date the reduction in sundries, fuel and light has been small. The costs of these and of shelter are more involved than those of food and clothing, and considerable time will probably be required before they fully reflect the downward trend of prices. The public sentiment is also a large factor in the price of these items.

The highest prices for each of the various authorities were as follows: Bradstreet, February, 1920, 233.1 per cent; Dun, May, 1920, 213 per cent; the Annalist, June,

1920, 231 per cent; United States Bureau of Labor Statistics, May, 1920, 272 per cent, and National Industrial Conference Board, July, 1920, 104.5 per cent. As this last percentage represents the value above that of July, 1914, to be on a comparable basis with the others it should be read as 204.5 per cent.

Trade papers state that the prices of commodities in Great Britain and other foreign countries are declining



ABOVE, AVERAGE TRAINMEN'S WAGE RATE FOR TYPICAL COMPANY COMPARED WITH THAT PREVAILING IN 1912. BELOW, RATIO OF TOTAL WAGES TO OPERATING EXPENSE

in practically the same ratio as here and any view of the situation should consider conditions on a broader basis than just what is happening in this country.

Only one conclusion can be reached from the charts shown. This is that wholesale prices have been off for some time and retail prices are rapidly going down and their trend is to a still lower level than the present. Several months are usually required before reductions in wholesale prices show up fully in retail prices. There is the natural tendency for the retail merchant to hold up his price at least until all the stock which he has purchased is sold. Again, his expenses for rent and wages, up to the present, have not been reduced in the same ratio as either wholesale prices or as the wages in industrial establishments. But as it is only natural to assume that the merchants' employees will receive a wage which will be in proportion to the other wages paid in the district, the cost of living in the near future will be in accord with the trend of wholesale prices.

WAGES AND UNEMPLOYMENT

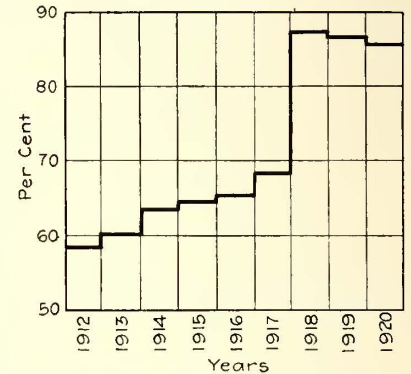
In its January bulletin the United States Department of Labor declares that unemployment is at present assuming very serious proportions. In January, 1920, there were 9,402,000 employees in industry in the United States. This number for January, 1921, had decreased to 6,070,648, or 35 per cent. Other unemployed persons brought the total up to 37 per cent. The same bulletin reported general wage reductions in many cases of 20 to 33½ per cent. How far this will be reflected in wage rates for the electric railway industry is problematical, but if the cost of living is reduced in the same proportion as wages no personal hardship should result.

In 1912 the total wages paid to electric railway employees amounted to 50 or 55 per cent of all the operat-

ing expenses, excluding taxes. At present this figure has advanced to from 67 to 75 per cent. This increase in wages with the increased material cost coming at the same time are the two principal factors in making the adverse operating statements of practically all electric railways today.

Very few companies have received increases in fare rates that return a sufficiently large gross to overcome the increased operating costs. A company which may be classed as typical of the industry illustrates the points mentioned. The results of increased wages paid and the percentage of trainmen's wage rates are plotted in a fourth graph

which shows about 72 to 75 per cent of total operating costs. The operating ratio for this company advanced successively year by year from 58.5 per cent in 1912 to 87.25 per cent in 1918. For 1920 this figure was 85.5 per cent. The margin between success and failure of a street railway as measured



OPERATING RATIO FOR TYPICAL COMPANY, SHOWING ADVERSE EFFECTS OF RISING COSTS

in operating ratio is

in reality very small. Before the days of abnormal costs, generally speaking, a company having an operating ratio below 60 per cent, all expenses being included, was considered as making a good financial showing, while one with an operating ratio of 70 per cent or above was thought to be headed for a receivership. So it can be realized that a difference of 15 per cent spells failure or success.

CONCLUSION

When one views all the evidence at hand the conclusion is that the cost of living will come down. Wages in all probability will be revised downward, but if the living cost is down, a corresponding reduction in wages ought not to be considered as serious by the employee.

As living costs tend to become stable on a lower price basis, general contentment will increase and society at large will in all probability be better satisfied with the revised conditions. When a dollar approaches nearer to the old purchasing basis, the increased wage which we have had will not be so necessary.

Work of Committee to Study Waste in Industry Well Under Way

A RECENT statement by L. W. Wallace, secretary Federated American Engineering Societies, indicates that the work of the committee of that society appointed to study the causes of waste in industry and means by which it can be eliminated is well under way. Ten representative industries have been selected for study, namely: Bituminous coal, building trade, transportation, men's ready-made clothing, printing, paper, metal trades, textiles, shoes and rubber. From three to ten plants of each elected industry are being visited by an experienced engineer under the direction of the committee. From the information obtained the committee hopes that it will be able to determine the extent, causes and remedy for unemployment.

Railroad Engineers Meet in Chicago

At Twenty-second Annual Convention of American Railway Engineering Association Held in Chicago March 15-17 Committee Reports Were Presented Covering Wide Range of Topics—Those of Particular Value and Interest to Electric Railway Engineers Are Abstracted in This Article

THE committee reports presented at the twenty-second annual meeting of the American Railway Engineering Association held at the Congress Hotel, Chicago, from March 15 to 17, contained a mass of material of value in the electric railway field. Abstracts of a number of these have been prepared from the point of view of the engineers interested in railway electrification or of the way engineer.

In discussing the report of the committee on electricity E. B. Katté, chairman of this committee, said in regard to the specifications given for insulated wires and cables that these were not written to supersede the signal specifications, but that it was the desire to have one specification that is applicable to all the various uses of electric insulated wire, and perhaps this may be brought about in the course of a few years. The committee which made the test in connection with the result and analysis was made up of representatives of four or five railroads, the United States Navy, the United States War Department and four or five manufacturers and after years of research they have finally agreed on a procedure which is fairly accurate. The railroad specifications for electric wires and cables and the specifications for incandescent lamps were approved for printing in the Manual as recommended practice.

The report on economies of railway location was presented and outlined by C. P. Howard, chairman. The text included under Appendix A and the conclusions reached were adopted for insertion in the Manual. The remainder of the report was received as information.

The work of the ballast committee for the past year was largely in the nature of a review of the instructions given in last year's report as information and was presented this year for adoption and inclusion in the Manual. Appendices B, C, D and E were adopted for printing in the Manual as recommended practice.

Nine subjects were assigned to the track committee this year and reports were presented on six. Recommendations adopted for printing in the Manual as recommended practice included spikes, both the $\frac{3}{4}$ in. and $\frac{1}{2}$ in.; specifications for switches, frogs, crossings and guard rails; a revision of tables of turnout leads and the plans of standard frogs.

An important development of the meeting was a letter sent by the chairman of the committee on rail, G. J. Ray (D., L. & W. R.R.), supplementing the committee's report. Mr. Ray, who was unable to be present, stated that no rails have yet been rolled to the specifications adopted in 1920 owing to the action of the manufacturers, who will not accept these specifications for rails of more than 110 lb. per yard and will only meet them for rails of less weight subject to certain modifications and an extra price. Mr. Ray believes that some of the claims of the manufacturers are reasonable, but on the other hand they have offered no constructive criticism of the specification. Their general attitude is that their own specifications and the 1915 specifications of the association are satisfactory, that the 1920 changes will

prove costly without improving the quality of the rail and that railways are not sufficiently interested in securing better rails to pay the extra cost of production. No action was taken or requested, but the committee this year will consider whether to adopt two specifications (for different grades of rail) or to adopt a single specification which will not require extra cost but will be accompanied by a list of specific requirements and their probable cost, for the benefit of railways requiring rails of higher grade.

The report of the committee on wood preservation this year was full of information without any recommendations for the Manual. A part of the report that should appeal to all maintenance engineers is that given in Appendix A on service testing records. These records have been compiled from experimental track in most cases and cover three different treatments.

Electricity and the A. R. E. A.

TAKING up first the problems of power distribution as covered in the report of the committee on electricity, it may be noted that this committee, of which E. B. Katté is chairman, gave the results of its year's studies on such topics as electrolysis, water power specifications for insulated wires and cables, electrical interference, underground conduit construction, etc. As recommendations for new work, the committee suggested co-operation with the United States Geological Survey in connection with the "super-power survey" and also with the Water Power League of America and advocated study and report on overhead transmission and distribution line construction for railroad use, with a view of preparing plans and specifications for aerial construction, working with appropriate committees from the signal section and telegraph and telephone section of the American Railway Association.

In reporting on the protection of reinforced concrete from electrolysis, the committee stated the conclusion that the protection of a concrete structure with a waterproof shell is preferable, because this not only safeguards the reinforcing bars from moisture and later oxidation, but also protects the concrete surrounding the rods from abrasion and eventual exposure of the bars. The inside of the protecting shell should be waterproofed with pitch having a melting point about 200 deg. F. and of specified flexibility. Material of the required kind has been manufactured for twelve years or more, but has not generally been used for waterproofing but mainly as roofing material and in pavements. It is necessary not only to inclose the sides of the reinforced concrete structure with a waterproof shell but also to protect the top or any other portion that is exposed by means of a waterproof pitch.

The sub-committee on water power presented data regarding the Norfolk & Western Railway electrification, which was stated to have been decided upon

primarily to secure greater facility of movement in a given time. It has also developed that the economy of electric operation is an important factor. Provision was made for interchange of emergency power between the railway steam plant located near Bluestone and the Appalachian Power Company's plant at Switchback. Charts were given in the report for typical fall and spring days, showing respectively for the two the following data: Total alternating current kilowatt-hours generated, 25-cycle, 353,500 and 249,800, and 60-cycle, 936 and 1,056; total alternating current kilowatts load for five minutes, 18,500 and 21,000; average power factor, 70 per cent and 65 per cent; load factor for five minutes, 79.6 per cent and 49.5 per cent; load factor for one hour, 85.6 per cent and 72.7 per cent. The high load factor in the first case is due to a large supply of emergency power to the power company.

The outstanding features of the Norfolk & Western electrification are the irregular spacing of trains and the ability of the generating equipment to supply large blocks of power on short notice. There have been instances where the power-house load has increased from 2,000 kw. to 25,000 kw. in less than five minutes.

Previous to electrification a standard tonnage train of 3,250 tons required three Mallet locomotives up a 2 per cent grade, making an average speed of 7½ m.p.h., while with electric locomotives the same train is handled by two engines at 14 m.p.h. Under steam conditions the round trip time of a crew out of Bluefield averaged twelve hours, while with electric operation it averages seven hours. Under steam conditions the time required to prepare a Mallet locomotive for a trip was from ten to twelve hours, while with electric locomotives forty minutes is allowed.

The report also gave comparative costs of steam and electric operation on the basis of 1,000,000 tractive miles, "tractive miles" being the product of the maximum tractive power in pounds and the total miles run. The respective amounts for steam and electricity for the several items of cost are as follows: Interest and depreciation \$4.36, \$12.16; repairs \$7.64, \$6.40; fuel of electric power at locomotives \$13, \$6.19; lubricants and wastes 16 cents, 5 cents; supplies 16 cents, 16 cents; engine-house expenses \$2.18, 56 cents; water 51 cents, nothing; wages \$1.89, 70 cents; total per 1,000,000 tractive miles \$29.90, \$26.20; saving by electric operation 12½ per cent.

With regard to fuel saving, the Norfolk & Western found that the modern Mallet compound superheating steam locomotive, equipped with all improvements except feedwater heaters, uses about 5.4 lb. of fuel per drawbar horsepower-hour, taking into account road conditions and allowing for standby losses, and assuming the engine to be in fairly good operating condition. With electric operation about 3.3 lb. of fuel is required. The annual saving for the present Elkhorn grade electrification is about 60,000 tons of fuel coal per year. The corresponding saving for the entire Norfolk & Western system would be nearly 1,000,000 tons per year. For the period January to June, 1920, the total mileage for an average of eight locomotives was 224,974, or 135 miles per locomotive per day. The kilowatt-hours at the power house per locomotive-mile averaged 160, and the watt-hours per trailing 1,000 ton-mile, 165.

After giving the Norfolk & Western data, the sub-committee concluded as follows:

1. That the use of 44,000-volt, single-phase, 25-cycle transmission of electric power with 11,000 volts single-

phase on the trolley wire is practicable for electric train service for heavy grade and heavy tonnage.

2. That the average daily gross tonnage of freight eastbound over the electrified grade on the Norfolk & Western for 1918 was 47,500 tons as compared with 32,000 tons in 1912, an increase of about 50 per cent. The ultimate capacity based on the present installation is stated as 80 per cent over that of 1912.

3. That such a system of electrification will probably effect the saving of at least 12½ per cent of the total annual expense as compared with steam operation on a railway with similar characteristics.

4. That the introduction of electric locomotive with electric brakes (regenerative braking) has made possible higher speeds on heavy grades with greater safety and reliability under all climatic conditions.

In addition to the report of the committee on electricity there was a section of the report of the committee on economics of railway location which discussed electrical equipment. This is abstracted on pages 634 and 635. It relates to the economics of location as affected by the introduction of electric locomotives.

ELIMINATING ELECTRICAL INTERFERENCE

Another sub-committee, charged with the duty of reporting on recommended practice for eliminating, so far as practicable, interference with telephone, telegraph and signal lines caused by propulsion circuits and adjacent transmission lines, gave the results of a questionnaire. No conclusions were drawn, but the interference situation on a number of roads was summarized.

On the New Haven Railroad a "three-wire" system of distribution is used, with the terminals of 22,000-volt auto-transformers connected to the overhead wires, the center point of these transformers being grounded to the rail. One terminal of the transformers is connected to the trolley wires, the other to the feed wires. Communication circuits are cabled in the electrified zone. Under normal operating conditions telephone circuits are quiet, but on the occasion of a heavy short circuit on the traction system, so-called "acoustic shocks" have been experienced. To minimize these, drainage coils have been installed at various points along the line, these coils consisting of resistors or condensers in series with retardation coils. No trouble chargeable to induction has been experienced in connection with the automatic signals.

On the Philadelphia-Paoli electrification booster transformers were installed to prevent leakage of current from rail to ground, but were found of little value and practically all have been removed. All telephone and telegraph circuits are underground. Resonant shunts are used around relays on the telegraph circuits which provide a bypass for 25-cycle current. On the Philadelphia-Chestnut Hill electrification no booster transformers were used and no trouble has been experienced in telephone and telegraph circuits.

On the Long Island Railroad, which is a direct-current third-rail electrification, the transmission feeders are paralleled by telephone and telegraph circuits throughout almost their entire length. The open-wire telephone circuits are transposed at regular intervals, usually about eight transpositions per mile. The only inductive interference in the communication circuits is an occasional trouble due to unbalancing of power circuits, usually of short duration.

On the Norfolk & Western the company's telephone

and telegraph circuits are open wire along the right-of-way, forming a close parallel to the contact and transmission circuits. Under normal conditions the inductive interference has been overcome to a very large extent on telegraph circuits by installing drainage shunts. This in conjunction with the special booster-transformer installation on traction circuits has cut down interference to a minimum; the only direct protection on railroad telephone circuits is transposition.

On the Great Northern three-phase electrification through the Cascade Tunnel the transmission line parallels the pole line supporting telegraph and signal line circuits, generally at a distance of from 80 to 90 ft. Interference with telegraph circuits, which was troublesome at first, has been overcome by the use of a twisted-pair steel armor communication cable.

On the Erie Railroad electrification south from Rochester, N. Y., interference occurs on a section 19 miles north of the transformer station located at Avon and 15 miles south thereof. Normally there is no disturbance from the transmission line, but induction from the 11,000-volt single-phase line is heavy on all single telegraph wires which come into this section. Under abnormal conditions the troubles are accentuated.

On the New York Central Railroad, West Shore branch, there is a parallel between the railroad's communication circuits and the 60,000-volt, three-phase, 60-cycle transmission line for about 115 miles, which normally causes no trouble. Under abnormal conditions severe surges are induced in railroad communication lines. On the Falls Road branch a short parallel causes trouble only due to contact. There has been some interference due to irregular power conditions on the parallel 20 miles long on the Walkill Valley branch, and a similar trouble on the Phoenix branch. In the Grand Central terminal electric zone 11,000-volt, three-phase, 25-cycle alternating-current power is transmitted to nine substations, partly on aerial lines and partly in cables. The telephone and telegraph lines are in cables in the same sections where the power line is cabled. In other sections the communication lines are part cable and part open wire on the side of the track opposite to the transmission line. There has been no electrical interference with communication or signal service.

On the Chicago, Lake Shore & South Bend Railway, extending from Kensington, Ill., to South Bend, Ind., the railway company's communication and signal circuits are carried on the same pole line as the transmission circuit without trouble. The Postal Telegraph & Cable Company's line parallels this road between West Blair Farm and Baileytown. Only under abnormal conditions due to short circuits and grounds are momentary troubles experienced on the telegraph circuits. The trouble is greatest when the railway company cuts out its 33,000-volt lines and carries the whole load on the system from the 6,600-volt, single-phase contact wire. Nothing has been done by the Postal company which eliminates these conditions.

SPECIFICATIONS FOR CONDUITS AND CABLES

The committee on electricity also presented railroad specifications for underground conduit construction for power cables, recommending that it be approved and printed in the Manual of Recommended Practice. The committee further recommended that the report on the National Electrical Safety Code, which outlined the present status of the code, be accepted as information and published in the *Proceedings* and that the com-

mittee be authorized to continue its co-operation with the United States Bureau of Standards. The committee further recommended that railroad specifications for wires and cables, which is presented, be approved and printed in the Manual as recommended practice. In connection with underground conduits, three new electrical definitions were suggested as follows: A *conduit* or *duct* is a unit length of pipe suitable for use in the construction of runways for electric light and cables. A *manhole* is an opening in a splicing chamber through which a man may enter. A *mandrel* is a tool for aligning and cleaning ducts.

The above abstract does not take up all of the detail items of the report, but refers particularly to those which will interest electric railway men.

Economics of Location as Affected by Introduction of Electric Locomotives

AN APPENDIX to the report of the committee on economics of railway location C. P. Howard, chairman, gave a summary of the advantages and disadvantages of the electric locomotive, beginning with the statement that railroad electrification, while most desirable from the point of view of the conservation of our fuel resources, is a matter that cannot be taken wholesale on account of the capital outlay required and the individuality of the problems of different railroads. At the same time, recent improvements in the steam locomotive have increased its efficiency practically 50 per cent, while its size and capacity have increased correspondingly.

The electric locomotive eliminates the turntable, cuts down standby losses, removes delay at water tanks and coaling stations, is more readily available than the steam locomotive for service, and its maintenance cost is lower. Its capacity increases with cold weather, and the simplicity of its control permits the crew more closely to observe the track and the signals. When properly designed the electric locomotive is easier riding than the steam locomotive and can have a more uniform distribution of weight with less nosing and track pounding, all of which tends to lower track maintenance. In addition the electric locomotive can concentrate large amounts of power under single control.

In steam locomotive operation each train has its own source of power which has no relation to the propulsion of the other trains on the line. In electric railway operation every train draws its power from one or more centrally located power houses. Steam trains are handled by locomotives only; electric trains may be propelled either by locomotives or motor cars.

ADVANTAGES OF ELECTRIC OPERATION

The committee summarized the actual and claimed advantages of electric operation in substance as follows:

The smoke nuisance is entirely eliminated. The entire weight of the locomotive can be concentrated on the drivers. Tractive effort can be increased without decrease in speed. Train weights from 18 to 25 per cent greater than is possible with steam locomotives can be hauled. The electric locomotive does not need to be taken out of service for cleaning, coaling, watering, etc., at terminals. Fuel consumption is low, but in comparison with steam locomotives all elements of power cost should be included. Unit cost of electric operation decreases with increase in volume of traffic.

The committee generally listed the handicaps to which the electric locomotive is subject somewhat as follows:

Electric equipment is costly, and it must bring about a great reduction in operating cost to justify its use. The electric locomotive is a transforming apparatus and is subject to overload, which the steam locomotive is not. Electric operation involves extra hazards to employees and others. An electrified system is liable to train delays inherent to the system, both due to equipment failures and power transmission line and power house failures. (The committee noted, however, that these delays are rare.) With electric traction, alternating-current track-circuit apparatus must be used for signals. Normal traffic cannot be exceeded for long periods unless the system has been designed to take care of maximum traffic. The power system load factor is apt to be low unless other load is carried. Electric locomotives are limited in their field of operation strictly to electrified track and so do not have the element of interchangeability possessed by steam locomotives.

As to comparative efficiency of the electric and steam locomotives in the matter of failures, the committee stated that the electric locomotive seems to hold its own. However, the steam locomotive has recently become a more formidable competitor due to the development of improvements, particularly the various outside valve gears, the superheater, the brick arch and the automatic stoker. It would appear that the ton-miles moved by 6½ lb. of coal in a steam locomotive are approximately equal to what can be moved by 1 kw.-hr. delivered from a power station, varying of course with the quality of the coal. In most cases the profits from electrification must be realized indirectly rather than directly, for example, from increased track capacity and the like. Steam railroads will generally consider electrification favorably when the reduction in operating expenses will pay the interest on the necessary investment; also when the track capacity must imperatively be increased, and this increase can only be supplied by a large additional expenditure or by electrification.

As to location economics, the introduction of electric traction will require changes in the economic values heretofore assumed under the classified heads of "distance," "rise and fall," "curvature" and "rate of grade." These topics were discussed in the report in some detail. The committee concluded that, taking into consideration heavy fixed charges of investment, no general conclusion can be given at this time as to the relative economies of electric and steam operation. Each case must be considered by itself, with due regard to all elements of cost and expense, both special and general, as well as operating conditions and the public comfort and safety.

Committee Reports on Way Matters

THE following abstracts cover the reports on track and allied topics. For convenient reference they have been arranged under the committee titles:

Committee on Ballast: The committee presented revisions of subject matter in the Manual; instruction for ballasting on operated line; specifications for stone ballast material and washed gravel ballast, recommended designs for standard ballast tamping bar, pick and fork. A design of standard ballast shovel was submitted for study.

Committee on Stresses in Track: A progress report was made stating that important information on stresses developed in curved track is in process of preparation for future report.

Committee on Rail: The committee presented its customary report on rail failure statistics. Continued

effort has been devoted to the search for the causes of transverse fissures. The investigation has indicated that the trouble may ultimately be traced to shrinkage cracks which occur during cooling, after passing the hot saws. A critical study is being conducted to determine the influence of mill practice on the properties of rails. The committee submitted new rail record forms to replace those now in the Manual. Some tests by Dr. Dudley show that there is a high residual ductility in rails even after five years of severe service. It is stated that tests for determining intensity of pressure on rail heads show that the pressure is least where the wheels are worn slightly concave.

Committee on Economics of Railway Labor: This committee stated that very little is being done by the railroads in exercise of care in selection of maintenance labor. There should be immediate action looking toward improvement of the labor situation and organized effort must be put forth to increase labor efficiency through education and training. The average age of roadmasters and track supervisors is forty-five years. Fifty per cent of the roadmasters and supervisors have had some engineering training. They each have charge, on an average, of 111 maintrack miles and 75 sidetrack miles. Ninety per cent of the common labor is composed of native white men. The average length of track section per foreman is 6.7 miles main-track and 3.1 miles sidetrack.

Committee on Standardization: A new and special committee has been appointed to assist in the promotion of the use of the association standards. The committee is to review specifications heretofore adopted and suggest subjects which need joint study by the several standing committees. The committee is also to suggest items of railway material which should be covered by standard specifications.

Committee on Uniform General Contract Forms: A number of revisions of the contract form now in the Manual were proposed. A tentative form of license for wires, pipes, drains and conduits on railroad property was submitted for criticism. A form of lease agreement for industrial sites was recommended for adoption.

Committee on Signs, Fences and Crossings: A number of changes were recommended in the specifications for standard right-of-way fences. Designs were submitted and recommended for adoption, covering a number of signs for mileposts, section sign, bridge numbers, etc. A tentative specification for highway grade crossings was submitted and a summary of the requirements and practice in the various states and in Canada was presented. There was also an extended discussion of crossing gates, warning signals, wigwags and bells. A matter of particular interest is the revision of the statement of laws relating to separation of grades at highway crossings. Electric railways are subject to these laws and this information forms a valuable record of the variations in the laws in apportioning costs and methods of procedure. The bibliography on elimination of grade crossings should be of great assistance to engineers having occasion to gather information on the subject.

Committee on Ties: A number of changes in definitions were recommended. None of the railroads use the specifications for cross-ties and switch-ties now in the Manual. New specifications have been prepared and submitted for adoption in lieu of those now in the Manual. It is recommended that test sections for

obtaining records of tie life be put in "out of face" and that not less than 100 ties of each kind be installed.

Descriptions of methods of inspection and the essentials for keeping adequate records were presented as information, and there was an extended discussion of the relative merits of various sizes of ties.

The subject of substitute ties received a good share of attention, and the committee called attention to the desirability of extended tests, believing that the engineering departments should take a more active interest in the development of substitute ties. Records of the various ties now under test were brought up to date. The committee called attention to its special report on the "Relative Merits of Metal versus Wooden Ties." This report was abstracted briefly in the *ELECTRIC RAILWAY JOURNAL* last year.

Committee on Iron and Steel Structures: This committee presented rules and unit stresses for rating existing bridges for approval. These rules have been under discussion for several years. The formula for impact is of particular interest to bridge engineers. Also, the principles applying to membrane waterproofing of bridge floors were discussed and submitted for approval. Particular attention must be given to drainage, reinforcement flashing and protection.

Committee on Water Service: The study of regulations relating to supply of drinking water on trains or premises of railroads brings out the fact that federal and state authorities are taking an increased interest in matters pertaining to drinking water supplies. The sanitary handling of such water is said to be in need of careful consideration and should be considered as important as any question of safety appliances. The handling of water to and in containers is a source of contamination. The Bureau of Public Health Service, United States Treasury Department, has requested that water containers be so constructed that ice does not come in contact with the water. The committee submitted specifications for substructures of wood and steel for water tanks for adoption and insertion in the Manual.

Committee on Wood Preservation: A report is made on Florida pine ties of the Public Service Railway which were treated with water-gas tar, fuel-cell treatment and installed in 1911. None has been removed to date and ties are in good condition. The availability of sodium fluoride as a preservative was discussed and the "toxicity" of the material was stated to be twice that of zinc chloride. More experimental installations are desirable.

The attacks of marine borers on piling is more extensive and more severe than formerly. Limnoria and toredo are particularly active. Creosote treatment is quite effective as a protection in some places but in others it is often inadequate and mechanical protection must also be applied. Creosote has so far not been found to stop attacks of limnoria. Various methods of mechanical protection, such as vitrified pipe, cast-iron pipe and concrete casings were described and illustrated in the report. Studding the piles with nails has been found to give protection against the toredo. Bark left in place offers protection for some time.

Committee on Wooden Bridges and Trestles: The committee reported that 16-in. stringers will be available for a long time to come. It is a depth largely used. Piles for trestles should have at least 14-in. butts and be driven to be safe for a load of 15 tons plus

impact. The recommended sizes for stringers, caps, posts and sills are given covering Cooper's E45, E55 and E65 loading. Ties should be 8 in. x 8 in. x 10 ft. not dapped, and spaced 12 in. centers. Guard timbers should be 4 in. x 8 in.

Specifications for classification and grading rules for timber and lumber used in maintenance-of-way work were recommended for adoption. A table of allowable working stresses for structural timbers was presented. This covers a large variety of timber species.

Committee on Masonry: Conclusions were presented by this committee covering use of concrete for sea water work. Particular care must be given to designs to avoid sharp corners, offsets or pockets tending to obstruct flow of waves and floating objects. A very dense, impervious aggregate is desirable and the component parts must be carefully selected. Especial attention should be given to design when reinforcement is used. No steel should be nearer than 3 in. to any surface and not less than 4 in. from any two adjacent surfaces.

Committee on Economics of Railway Location: A number of interesting diagrams, tables and conclusions were presented by this committee for adoption, covering the resistance of trains running between 35 and 75 m.p.h.

Committee on Shops and Locomotive Terminals: An extended progress report on design of car shops was presented. A variety of designs of existing shops were illustrated, with a number of tentative conclusions covering such matters as track centers, space allowed per car, supply tracks, clearances, headroom, doors, paint shops, lighting and heating.

Committee on Track: Under "Revision of Manual" some slight changes were recommended by the committee in the design of cut track spikes. The design originally adopted did not show certain details correctly. Designs for $\frac{5}{8}$ -in. and $\frac{3}{4}$ -in. spikes were presented for adoption. It is reported that these spikes can be made in automatic machines. There had been some trouble about this with the earlier design.

Specifications for switches, frogs, crossings and guard rails were presented for adoption. There were many points in these specifications which are similar to those adopted by the American Electric Railway Engineering Association covering plain bolted special trackwork and materials for manufacture of special trackwork. Data for laying out bolted rigid frogs, railbound manganese-steel frogs and solid manganese frogs are presented and recommended for inclusion in the Manual. Standard dimensions for solid manganese frogs, tables of practical and theoretical turnout leads were also included in the recommendation. An elaborate progress report was made on gages and flangeways for curved crossings. Tentative specifications covering tie plates were presented for criticism.

Committee on Roadway: Subsidence and shrinkage of embankments were reported on extensively by this committee. Some subsidence occurs under an embankment except those built on rock. It is due to displacement or compression of earth under embankment. It must always be expected in swamps, marsh, bogs and any land where there is standing water. Shrinkage is composed for four elements: Wastage due to loss in haul; due to wind erosion; water erosion, and compression. The latter is by far the largest factor. The customary allowance of 10 per cent of shrinkage of

earth is very nearly correct. Swell is often found in rock or shale. This may be as great as 60 per cent. No rule for swell can be given for general use. Specifications for corrugated metal culverts were presented for study. These culverts can be used to advantage in numerous instances. A number of conclusions on drainage of wet cuts were presented together with a number of illustrations of methods which are recommended for providing such drainage.

Committee on Economics of Railway Operation: The report of this committee is too elaborate to admit of an abstract which would do it justice. Of interest in connection with "human engineering" is a report on methods for increasing efficiency of employees by furnishing them with reports and comparisons. Methods for increasing traffic capacity of a railway were the subject of valuable studies presented as appendices to the report. The effects of speed on costs of track maintenance and on cost of transportation and cost of maintenance of equipment are subjects treated in Appendix C. It is evident from these reports that speed costs money and requires a better standard of maintenance. Quite definite increases in expense may be expected; operating speeds increase in way department accounts and these run through all of the maintenance accounts from superintendence down.

Committee on Rules and Organization: A manual of instructions for the guidance of engineering parties and a manual of rules for the guidance of employees of the maintenance-of-way department were recommended for adoption. These are to replace all matter on rules and organization now in the Manual. The instructions for engineering parties are very thorough and should be in the hands of all railway engineers. The manual of rules for way employees is prepared with the view of covering matters broadly so that they may be used as a basis for the rules of any way department.

Under the head of "Science of Organization" the committee presented the fundamentals of organization and outlined the two general types of organization now in vogue, namely, the line type and the staff type.

Diagrams or charts of these are given and the charts show the workings of the two divisions of the line type as used by railroads, *i.e.*, departmental and divisional.

Double Circuit Breaker Safety Switch

THE Cutter Company, Philadelphia, Pa., has just placed upon the market a new type of inclosed circuit breaker which serves not only for protection from overload but also acts in place of a double-pole switch. The new device, which goes under the name of "U-relite," consists essentially of two circuit breakers, one on each side of the line, inclosed in a steel box. The switch is operated by first turning a handle on the outside of the box to the left, which closes one of the single-pole circuit breakers. Turning the handle to the right closes the other circuit breaker. It is so designed that after one breaker is closed it is free to respond and instantly open the circuit, should the other one be closed against an overload or short circuit. It is this construction which makes the knife switch unnecessary. After the circuit is established, when actuated by overload or when tripped by hand by means of a knob, both sides of the circuit are opened simultaneously. This type of switch is manufactured in ampere ratings of from 2 to 60 amp., for use on either alternating or direct current of voltages of 250 or less.

Oklahoma Utilities Hold Convention

Utility Men of Oklahoma Optimistic—John W. Shartel, Oklahoma Railway, Says that Improperly Regulated Utilities Cannot Be Successfully Financed Nor Can They Give Adequate Service

THE most successful convention in the history of the Oklahoma Utilities Association came to a close on March 10 after a three days' session at Oklahoma City, Okla. It was attended by more than 300 utility operators and others interested. A spirit of optimism pervaded the convention in spite of the difficulties so many members are having in financing new properties and improvements. Nevertheless, the spirit of Western hospitality and enthusiasm prevailed. The public officials who addressed the meeting included Gov. J. B. A. Robertson of Oklahoma; Campbell Russell, chairman of the Oklahoma Corporation Commission; Paul Walker, referee of the State Supreme Court and former attorney of the Corporation Commission, and H. W. Hubenthal, chief telephone engineer of the commission. Paul P. Hayes, member of the Public Service Commission of Indiana, made the principal address at the banquet on Monday night, March 9. Other speakers were John W. Shartel, vice-president and general manager of the Oklahoma Railway; J. W. Ingison, Ingison Hydro-Electric Power Company, Minneapolis, Minn.; H. B. Wright, H. B. Wright Investment Company, Kansas City; C. J. Griffith, Little Rock Railway & Light Company, Little Rock, Ark.; William B. Way, secretary of the National Gas Association of America; James P. Barnes, Louisville Railway, and C. L. Mitchell, Minnesota Electric Light & Power Company, Cushing, Okla.

Officers of the association elected for the ensuing year are John W. Shartel, Oklahoma City, president; C. E. Devin, Apache, first vice-president; F. A. Willard, McAlester, second vice-president; William Mee, Oklahoma City, treasurer, and H. A. Lane, Oklahoma City, manager. An executive board comprising fifteen members was also chosen.

In an address, in response to a speech by Governor Robertson, Mr. Shartel declared that the utilities do not object to regulation, but it should be intelligently administered. He recommended a revision of the whole system of dealing with the utility question and predicted that with a reorganized electric system and adequate facilities the state would have an increased population of 750,000 within five years. Unless the public wishes to furnish the capital to finance these utilities, private capital must have its recompense. Private capital will not come in unless it has a promise of absolutely fair treatment. The great difficulty with the public utility situation is that the people have not yet grasped these fundamentals.

Headway Recorder Supplies Traffic Data

THE Youngstown Municipal Railway has installed a Nachod type R-2 headway recorder on one of its lines for the purpose of studying traffic and schedule conditions and securing data on interruptions to service. This device can be used either on single-track or double-track lines, for as a car passes under the trolley contractor, an impression is made on the chart which shows the time the car passed and also its direction. It is the plan to transfer the recorder from one line to another so that the same study may be made on any line on the system.

Branch of St. Paul R. R. Electrified

Freight on Old Chicago-Evanston Branch of St. Paul Railroad Now
Handled Electrically by the Northwestern Elevated Railroad
—The Overhead Construction of This Electrification
Is of Interesting but Special Design

THE Northwestern Elevated Railroad, Chicago, operates between Evanston and Wilson Avenue, Chicago, on right-of-way leased from the Chicago, Milwaukee & St. Paul Railway. This branch of the St. Paul was originally the Chicago & Lake Superior Railroad, but it was never extended any farther north than Evanston. Passenger service was discontinued on it some years ago, but the steam road has retained a track adjacent to the electrically operated elevated line for the purpose of giving freight service to a number of industries located along the right-of-way, consisting mainly of coal and building material dealers. When it became necessary to elevate the tracks of the Northwestern north of Wilson Avenue, in accord with a city ordinance, the work of necessity included the St. Paul Railroad and the industry spur tracks. With this freight service elevated, the presence of noisy and smoky steam locomotives in the high grade residential section was

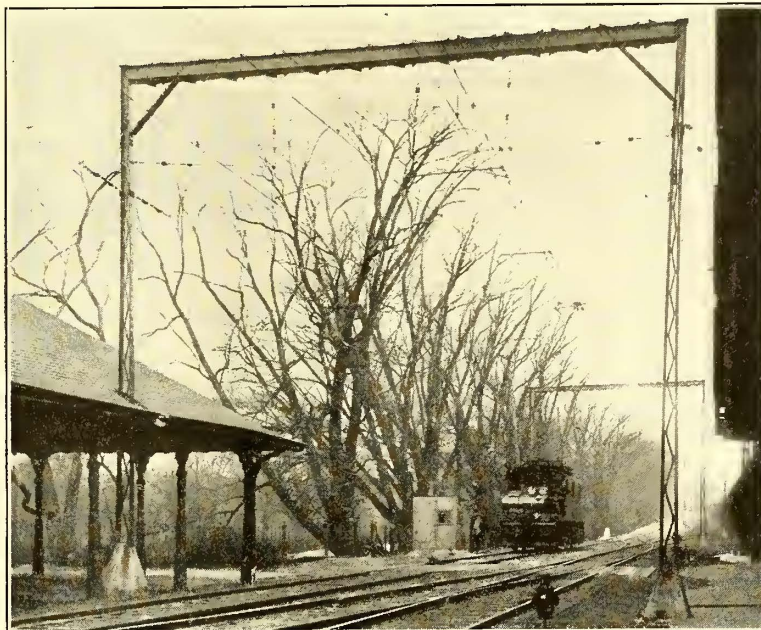
more than ever undesirable. Consequently, when a new contract was entered into between the elevated and the St. Paul Railroad, which provided facilities for extending service north from Wilson Avenue to the city limits at Howard Street, one of the terms written into the contract by the steam railroad was that this freight service should be handled by the Northwestern Elevated Railroad for the St. Paul at cost. Accordingly, the former company has electrified the track used in this freight service, and this track will now be used for freight service during the non-rush hours. During the rush hours the tracks will be used for elevated passenger trains only, thus enabling the operation of both local and express trains from the downtown loop to Howard Street, the city limits, in both directions.

In handling this freight service for the steam road, the elevated company simply acts as the agent of the St. Paul, setting empty cars in the siding and hauling away loaded cars, or vice versa, and having nothing to do with the accounting, billing, or any of the details aside from actual transportation. A monthly settle-

ment is made on the basis of a fixed sum per loaded car moved, and the contract provides for the adjustment of this sum at stated intervals to take care of fluctuating costs.

The steam road leaves the cars in a receiving yard located between Irving Park Avenue and Montrose Avenue and having a capacity for thirty loaded and thirty empty cars. This yard comprises three tracks,

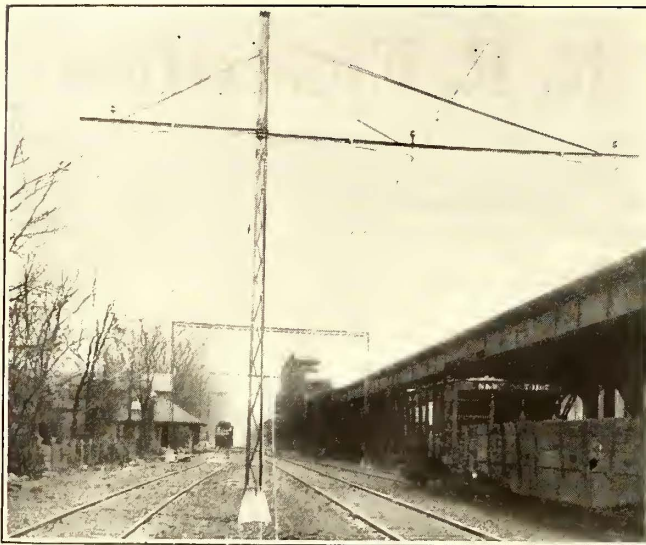
one of which is the main line and one the storage track for loaded cars and the other the storage track for empty cars. About fifty cars a day are handled. Cars are taken from and delivered to this yard by the two electric locomotives purchased by the Northwestern for the purpose. Immediately north of the yard the track ascends a 2 per cent grade onto the elevated structure. This freight track then extends north to Howard Avenue. From there to Evanston freight trains will be hauled over the two tracks of the elevated line. One of the most interesting parts of



CATENARY OVERHEAD ON CHICAGO ELECTRIFICATION OF ST. PAUL R.R. BRANCH, SHOWING BRIDGE CONSTRUCTION WHERE GUYING WAS IMPOSSIBLE—APPROACH TO ELEVATED TRACK IN BACKGROUND

this electrification work was the construction of the overhead. At the present time, the elevated cars are operated between Wilson Avenue and Howard Avenue by means of the overhead trolley, but it is expected that this will be replaced with third rail, as used on the remainder of the system, at an early date. However, on account of clearances, it is impractical to employ a third rail on the track used in the freight service, so that it has been necessary to put up a permanent overhead construction for one track for the distance of 5 miles from Irving Park Boulevard to Howard Avenue. When this track is used during the rush hours in the passenger service it will be necessary to use the overhead trolley. As the cars operating on the Northwestern line must be equipped with trolley poles in order to operate north of Howard Avenue anyway, this will not bring in any new complication.

The overhead construction employed is of the catenary type supported on 6-in. top 35-ft. and 50-ft. Bates expanded steel poles and steel mast arms. The poles set in the ground are all set in concrete 5 ft. deep and spaced for 150-ft. spans. The mast arms sup-



STEEL POLE SUPPORTING OVERHEAD OVER THREE TRACKS, SHOWING CONCRETE FOOTING AND MAST-ARM CONSTRUCTION



METHOD OF DEAD-ENDING HEAVY OVERHEAD—END POLES ARE GUYED TO 2-TON CONCRETE BLOCK ANCHORS BURIED IN THE GROUND

porting the overhead are made up of two pieces of 2½ x 2½ x ¼-in. angle irons bolted together back to back with the pole and truss pins and spacing blocks in between the two angles. The messenger supporting the No. 0000 grooved trolley wire is of ⅝-in. Siemens-Martin steel cable. In the storage yard at Irving Park Boulevard it was necessary, on account of lack of space of guy poles adjacent to the "L" structure, to support the overhead over the three tracks on a single line of poles, necessitating the use of 24-ft. mast arms on one side. The overhead equipment was of Westinghouse and Drew manufacture.

Just north of the yard, on account of the long cross-span necessary to provide for three tracks, the heavy weight of the overhead special work at that point, and short guy space, a bridge construction between Bates steel poles was employed. This is shown in an accompanying picture. Over the incline leading up to the elevated track a double trolley was installed in order to provide more current-carrying capacity, for the two

locomotives are sometimes coupled together to pull heavy loads up this grade. In this case they may pull as high as 2,000 amp. each for a period of five or six minutes.

METHODS OF SETTING POLES

Several different methods of setting the steel poles was necessary in providing for the different conditions existing along the elevated construction. On the permanent elevation work, the poles were set on the top of the retaining wall or on the concrete curbing on slab construction, and in such setting a special footing was provided for the pole by bolting a piece of channel iron to either side of the pole, as shown in the accompanying drawing. Additional strength at the base of the poles was gained by filling with concrete up even with this top base support. The various methods of setting poles are shown in the accompanying drawing.

An interesting special case of pole setting was that used along the approach to the elevated structure and

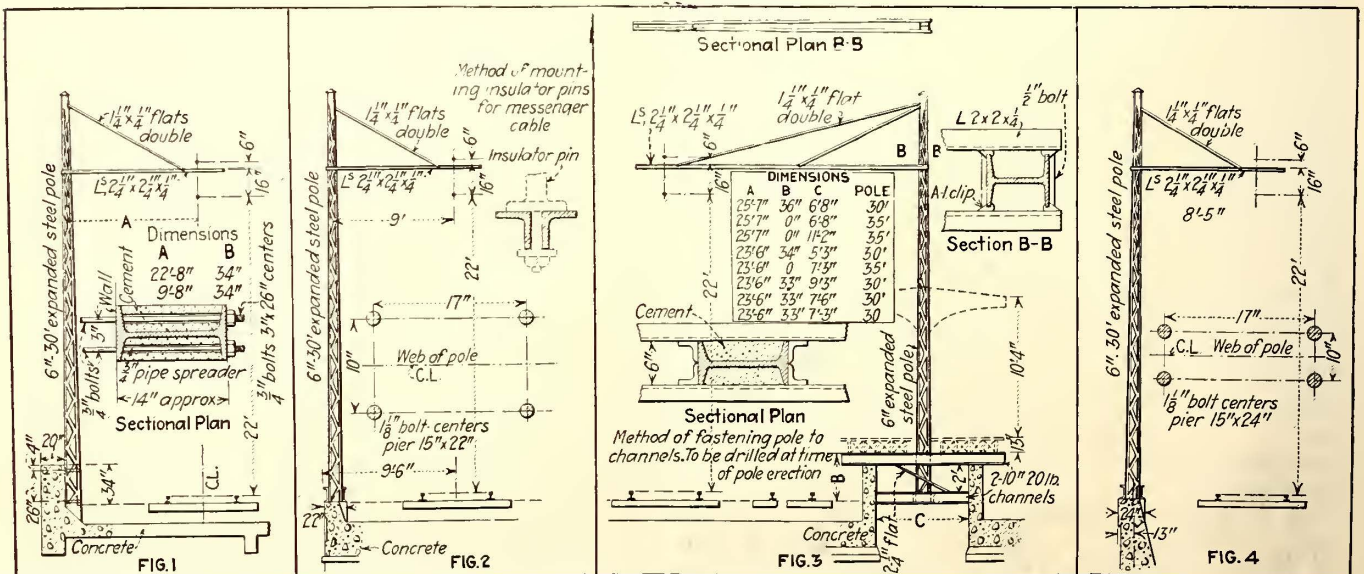


FIG. 1—METHOD OF SETTING STEEL TROLLEY POLES ON BRIDGES WHERE SIDE GIRDER EXTENDS ABOVE TRACK LEVEL. FIG. 2—METHOD OF MOUNTING POLES ON CURBING WHERE THERE IS A SLAB CONSTRUCTION. FIG. 3.—METHOD OF SETTING POLES IN CENTER OF STATION PLATFORM CONSTRUCTION. FIG. 4—METHOD OF SETTING POLE ON TOP OF CONCRETE RETAINING WALL FOR FILLED-IN EARTH ELEVATION

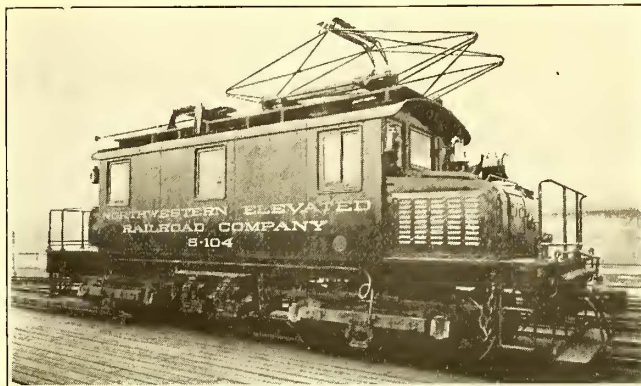
at certain other points. Here the poles were set in the ground adjacent to the concrete retaining wall, making necessary a 50-ft. pole. These 50-ft. poles were made up of three standard 25-ft. steel poles, two of which form the base, with the third as the upper part and supported by fastening to the top of the bottom sections. The two bottom poles were erected and riveted together side to side, with six rivets. The upper section was then held in place by means of two plates overlapping the top and bottom poles and riveted thereto with six rivets in each plate.

ELECTRIC LOCOMOTIVES USED

For the sake of standardization, the two 50-ton Westinghouse 600-volt direct-current locomotives purchased by the Northwestern for handling this freight service were equipped with the same size wheels, the same motors and the same gear ratio as that used on the latest type of steel cars purchased for passenger service on the elevated lines. Each locomotive is equipped with four Westinghouse 567-R-1 motors. The wheels are 34 in. in diameter and the gear ratio 17 to 60.

These motors are of the field control type, developing 165 hp. each on one-hour rating. The locomotives are arranged for multiple-unit control so that they may be coupled together for pulling a train as long as twenty-five cars up the 2 per cent grade approaching the elevated structure. They are equipped with Economy watt-hour meters. There are three running points provided in the control, providing three operating speeds. These are derived by connecting all four motors in series, two motors in series and two in parallel, and four motors in parallel. The motorman notches up the throttle-type controller through sixteen points to the full series position, then brings the controller back and throws a change-over lever which provides for the parallel running points.

The brake equipment is of the Westinghouse 14 E. L. locomotive automatic type with air supplied by



ONE OF THE ELECTRIC LOCOMOTIVES USED BY NORTHWESTERN "L" TO HANDLE ST. PAUL R.R. FREIGHT

a Westinghouse Type D-3-F 35-ft. compressor designed for continuous duty. All equipment is mounted inside the cab. The trucks are of Baldwin Locomotive Company manufacture.

Pneumatic Wrenches Used for Tightening Track Bolts

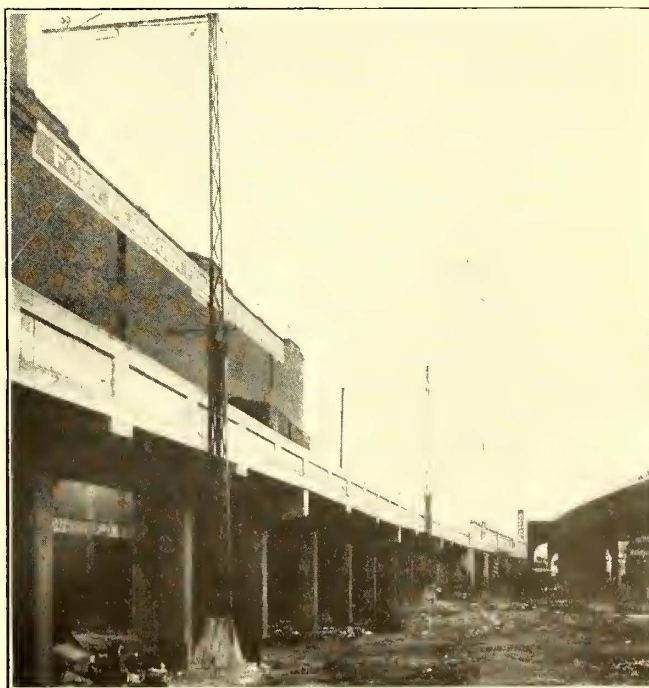
IN SEVERAL recent operations of laying rail, the Lehigh Valley Railroad has used pneumatic wrenches for running up and tightening the track bolts. As this was its first attempt the organization worked out for the operation was somewhat of a makeshift character.

In one instance an air compressor was pushed along by hand and four pneumatic wrenches were attached to it by air hose. This arrangement covered two joints at one time. In another case, a motor car was attached to the compressor and but two wrenches were operated. The time for running up a joint and moving to the next averaged about thirty seconds per joint.

The men released by the machine were placed at work on the old rail preparing it for loading.



DOUBLE TROLLEY WAS INSTALLED OVER THE GRADE UP TO THE ELEVATED TRACK—SIMPLE SINGLE-TRACK POLE AND MAST-ARM CONSTRUCTION



METHOD OF ERECTING OVERHEAD POLES, MADE UP OF THREE LENGTHS RIVETED TOGETHER, BESIDE THE ELEVATED STRUCTURE

Two Live Topics Discussed

The Merchandising of Trolley Freight and Express Service and the Latest Facts Regarding the One-Man Car Were Subjects of the Recent One-Day Conference of the New York Electric Railway Association's Quarterly Meeting, Which Was Held at the Biltmore in New York City on March 18

THE twenty-fourth quarterly meeting of the New York Electric Railway Association was held in New York City on March 18. A part of the conference was the subject of an article in the issue of this paper for March 26, page 601. There the paper by L. R. Brown, New York State Railways, was abstracted and the discussion which it provoked was summarized. Below are reports of the informal discussion of the freight and express business of electric railways and of the safety car.

Freight Department Has Great Opportunity to Help Increase Net Income

THE discussion on electric freight business was opened by T. H. Stoffel, railway department Westinghouse Electric & Manufacturing Company. He said that railway men do not generally realize the importance of intelligent and well-directed freight solicitation. While the securing of freight tonnage is properly the principal function of the traffic department, often this department is handicapped and subordinated to the operating or transportation department. It is relegated to the position of a clerical division, with activities largely confined to compiling tariffs, quoting rates, adjusting claims, etc. The head of the traffic department is entitled to rank with the chief transportation officer and should be vested with complete responsibility for the results of freight operation. He should have a voice in the arrangement of freight schedules, distribution of equipment, etc., and should enjoy the full co-operation of the transportation department. This is a plan of organization generally in effect on steam railroads, evolved from many years of experience.

The electric railway engaged in freight handling may be compared to the manufacturing plant, the transportation department being the manufacturing end and the traffic department the sales organization. No manufacturer would expect in normal times to dispose of his product without a sales force, and the electric railway needs a well-organized soliciting force, backed up by adequate rolling-stock and terminal facilities, together with strict maintenance of advertised schedules, in order to sell its one commodity, transportation service.

Mr. Stoffel outlined the desirable characteristics in the freight solicitor, who, he said, in addition to a thorough understanding of the classification, rates, routes, schedules, etc., requires considerable tact and knowledge of human nature, coupled with personality which inspires confidence. He will be called upon from time to time to solve many knotty transportation problems, smooth over complaints, inspect damaged shipment, arrange payment of claims, and generally satisfy the needs of patrons. He must also educate shippers as to matters in connection with forwarding goods. The freight solicitor who can gain and hold a shipper's confidence and assist him in solving his problems will receive preference in the routing of shipments.

As the purchaser or consignee, as a general rule, pays

the freight and controls the routing, Mr. Stoffel said that it is very necessary that he be induced to include a desired routing on his order for goods. This requires personal effort, as the practice of securing routing requests on blanks provided for the purpose by the railway and filing them with the shipper does not in general bring the desired result. It should be the freight solicitor's duty fully to acquaint himself with the tonnage moving to and from his territory at all times, and be able to anticipate shipments of seasonable goods far enough in advance to make early solicitation and to have routing by way of his line based on orders sent in. The representative at the shipping point should also be kept fully informed. Local agents along the line can also assist in this work by transmitting to the traffic department full particulars regarding shipping information which they pick up from time to time.

Among other ways mentioned by Mr. Stoffel in which freight traffic can be developed were co-operation with civic bodies interested in the advancement of their communities with a view to securing new industries for the towns and locating them near electric railway lines, finding new markets for established industries, assisting industries in locating and securing raw materials, and even creating a fairly new industry for the territory. As an example, through the traffic department of one electric railway, a tomato raising and canning industry was located along its lines, with the result that it enjoyed an excellent business hauling tomatoes to the plant and from it to distributing centers.

In conclusion, Mr. Stoffel urged the importance of using newspaper and other advertising, particularly cards or folders containing maps and information as to schedules, rates and service, which can be placed in the hands of traffic managers and shipping clerks. A lively discussion followed these remarks.

DISCUSSION ON FREIGHT MATTERS

Speaking for the freight department of the Rochester & Syracuse Railroad, H. C. Stanton said that on this property solicitors are employed the year round. They call at least twice a year at the intermediate stations and for the remainder of the time are at the terminals. Card records giving full data of calls are kept by the traffic department. Advertising is done by circular letters, cards in waiting rooms, etc. The freight business, said Mr. Stanton, must stand on its own feet. Business now needs to be gone after, as competition is keen and shippers are watching rates. As interurban rates are high, good salesmanship is required. It is important that every promise made be kept scrupulously. At the suggestion of H. H. Norris, ELECTRIC RAILWAY JOURNAL, who spoke of the advertising value of attractive freight terminals, Mr. Stanton described the new terminal at Rochester.

The necessity for getting new business was urged by W. J. Harvie and W. J. Lee, Auburn & Syracuse Electric Railroad, who reinforced Mr. Stanton's statements as to the importance of personal solicitation, say three to five

times a year, to advertise the superior quality of the service and thus to offset the effect of the slightly higher rates. Another speaker suggested applying to the traffic business the principles followed by the manufacturers in knowing more about their customers' business in some particulars than the customers themselves, and in studying the ways in which the customers can be served. Further, there must be co-operation between the freight solicitors and the operating management so that the former will know what kinds of business are profitable and should be sought.

T. R. Langan, Westinghouse Electric & Manufacturing Company, said that if the electric railway people were as enthusiastic as the truck salesmen, and believed in themselves as thoroughly, they would get better results. He suggested as timely questions those relating to the obstacles which are met in selling railway freight service and to the extent to which electric railway traffic men are co-operating in the freight business. Other questions relate to the places in which the freight business can best be developed.

TRUCK COMPETITION NOT SERIOUS

As to the matter of truck competition, Mr. Stoffel said that this is not as serious as some seem to think. The chief difficulty with truck operators is to get them to keep accurate accounts of expenses. Most of them are living on the depreciation of their trucks. Trucks cannot compete with electric railways on runs longer than 20 to 25 miles. Some industrial concerns or merchants make their own deliveries up to 30 miles, but they would not find this profitable if they allowed for overhead expense. A large number of truck operators in business two years ago have now given up. Mr. Stoffel expressed the belief that electric railway men make too much of the truck competition, which he did not consider permanent. In answer to a question from Mr. Harvie as to the desirability of reducing electric railway freight rates to compete with steam railroad and truck rates, Mr. Stoffel said that this should not be done. The same basis of rates as that used by the steam roads should be used. Trucks cannot operate at less than American Railway Express Company rates. The superiority of electric railway service with respect to the effect on the shipment should be made much of. For example, milk and live stock are delivered in much better condition and the service excels on perishable products.

A. J. Manson, also of the Westinghouse company, said that success in selling electric railway freight service is largely a matter of analysis of the sales possibilities on a particular property. Moreover, steam railroads are going to become more congested in the future and they will find local business less profitable to handle as time goes on.

H. C. Page, general manager Worcester (Mass.) Consolidated Street Railway, said that his company is doing considerable freight business, which is an excellent business to develop, because once a customer is secured, he seldom gives up the service. This service is quicker and more reliable; there is no reason for fearing motor truck competition, because the electric railways will get their legitimate business in the long run and the limit of economical radius for truck service is less than 20 miles. Truck operators are not as enthusiastic as they were. The trouble with the electric railways is to get the equipment to handle the business. Direct truck service between New York and Worcester was inaugu-

rated some time ago, but has not proved successful. As an example of electric railway freight service, Mr. Page cited the motor and trailer night train operated between Boston and Springfield. His company furnishes a two-man crew between Worcester and Springfield. The business is profitable. Freight cars are dispatched carefully just like passenger cars and steam road rates are charged. In conclusion, he said that his company would not think of giving up its freight business.

The discussion on freight and express traffic was closed with a number of short suggestions. D. E. Crouse, Rochester & Syracuse Railroad, said that electric railways should take a hint from the manufacturers and furnish their freight solicitors with "kinks" which would make the service attractive. H. N. Ransom, Westinghouse Electric & Manufacturing Company, asked as to the use of containers moved on flat cars, but this point was not discussed. Frank Hickey, Rochester & Syracuse Electric Railroad, urged that motor trucks be put under public service commissions to force them to carry their share of the road maintenance cost, etc. Mr. Stoffel said that motor trucks are going to be suitably taxed. Already substantial annual and mileage taxes are being levied and this will help to solve the problem of competition. Chairman Cherry agreed that rates should not be lowered in competition with truck and steam railroad service. The whole thing sums up thus, he said: "Good service deserves good rates."

One-Man Car Operation

A DISCUSSION of the advantages and disadvantages of one-man car operation was taken up immediately after luncheon. R. E. McDougall, manager traction lines New York & Harlem Railroad, told of his experience in operating one-man cars on the Eighty-sixth Street crosstown line in New York. This operation was begun as an experiment last July with double-truck cars having folding doors and steps. The only change made for their use in one-man operation was to lock the back door.

The crosstown line is approximately $1\frac{1}{2}$ miles long and this service is now taken care of by ten cars during the off-peak period, with fourteen to sixteen cars during the rush hours. The cars are 37 ft. long, weigh approximately 15 tons and seat thirty-six passengers. The operation has been successful and the operators have had no trouble in handling the passengers. A small Johnson fare box is used and this is carried from end to end by the operator whenever he changes his operating end. This line is carrying approximately 14,000 revenue passengers and receives 4,000 transfers per day. The service is taken care of by operating a 3.7-minute headway during off-peak periods and a two-minute headway during rush hours. The scheduled speed is 7.7 m.p.h. and the cars are operating approximately 1,300 miles per day.

A noteworthy result of this operation is that the earnings have increased approximately 85 cents per car-hour and from 9 to 11 cents per car-mile.

Mr. McDougall said that there had been no increase in accidents other than some due to vehicular traffic, and this he believes was accounted for by the present use of twenty-eight city buses that were not in operation the previous year, with which the present operation was compared. Later, in answer to a question as to how he accounted for the increase in earnings, Mr. McDougall said that he believed some of this was

due to people changing from bus riding to riding in the cars, as there had been a falling off in passengers carried by the buses. The motormen operating these cars receive 5 cents per hour more than those operating two-man cars. No breaking-in period was used at the time of starting the operation. A notice was posted and verbal instructions given, but otherwise no additional instructions were given the motormen.

W. G. Gove, superintendent of equipment Brooklyn Rapid Transit Company, told of the experiences that his company has had in operating Birney safety cars during the past year. He said that no subject is of any more active interest at present than that of reducing platform expense and of realizing economies that result from safety-car service. The service in Brooklyn is quite varied. Operation of safety cars at the present time is over bridges which have a considerable length, and in suburban service where the stops per car-mile are comparatively infrequent. Also the cars are operated through a more-or-less congested district.

At the introduction of safety car operation, the service was given no particular publicity, and so far no serious trouble has been experienced from the riding public. The crews of these cars receive 5 cents per hour more than the regular rates, which are 57 cents to 67 cents per hour.

Mr. Gove said that at present the Brooklyn surface lines are operating approximately 2,000 cars daily and he believes that there is a field in Brooklyn for the operation of at least 1,000 safety cars at the present time.

DESIRE FOR LARGER CAR DISCUSSED

In regard to various criticisms which are being made of the Birney type of safety car, which would seem to indicate a desire for a larger and heavier car, Mr. Gove said the more quickly the operators divorce themselves from the experiences which they have had with other types of cars the better it will be for all concerned. The only excuse for adding more weight is to increase the strength, and while at present truck drivers in Brooklyn seem to feel that they can take somewhat more liberties with the light cars than they would attempt with the heavier ones, still Mr. Gove said that he had found that while accidents are more frequent the repairs can be more easily taken care of. The type of construction permits of the cars being put back into shape with less cost than would be the case with heavier type of construction. As a result of the one year's experience Mr. Gove felt that the maintenance cost which had been occasioned by accidents was not particularly high with the safety car.

At the present time the Brooklyn company is contemplating changing over 200 double-truck cars for one-man operation. These cars are provided with what is called a "one-third vestibule" and changes will have to be made in order to provide folding doors and steps. It is the intention to use all the standard safety devices in equipping these cars.

In answer to a question by J. K. Choate, vice-president J. G. White Management Corporation, Mr. Gove said that, comparing the probable life of the Birney car with the life of standard cars, he considered the life of the New York Municipal's subway car to be approximately thirty-three years and that of the safety car to be about twenty years. In regard to over-motoring safety cars to reduce maintenance cost, Mr. Gove said that he did not recommend this practice,

but that care should be taken not to overload the motors by using safety cars to push snow out of the way. The experience in Brooklyn in the winter of 1919-1920 was somewhat discouraging during the first snowstorm, as due to lack of knowledge on the part of the transportation department quite a lot of safety car equipment was burned up. Profiting by this experience, the safety cars were run in as rapidly as possible during the late snowstorm and no attempt was made to operate them through snow.

CHICAGO CAR REFERRED TO

Mr. Choate referred to the opinions being voiced by some operating men that the single truck is a mistake for safety-car operation, as this type of truck rides badly over rough track in pavements and there is sure to be nosing on any track. Mr. Choate said that in Chicago they were now building a car for trial with maximum-traction trucks and of a slightly larger capacity. He felt, he said, that one-man cars have led to more overloading than has been experienced with any other type of car. He also said that he did not believe that the present light-weight cars would last twenty years and that a somewhat stronger construction was desirable. In reply Mr. Gove said that it does not necessarily follow that because a car is light its depreciation is rapid. As maintenance is probably the most vital factor, if a car was kept up in proper condition its life will be increased materially.

As to the use of a larger car, Mr. Gove said that he does not consider the safety car other than as a development of a unit; there is a wide field for the present type of car and just as wide a field for a double-truck car or a larger car. It would, however, be a serious mistake to have too many designs of safety car. No doubt improvements in car construction and equipment can be made in the present car, and these of course should be incorporated. In regard to brake rigging, he considers the present design safe and especially so when used with steel wheels as in Brooklyn.

In reply to a question as to the effect of over-motoring the cars and the desirability of doing this with any new equipment, A. J. Manson, Westinghouse Electric & Manufacturing Company, said that motors operating at 100 per cent of their full load rating would have a certain temperature rise. If the motors were operated at 80 per cent of their rating the temperature rise would be nearly as great, so that the life of the windings, which necessarily depend upon the temperature rise to which they are subjected, would not be materially longer. He said, however, that under overloading the conditions were somewhat different, as if the equipment was operated at 110 per cent of the full load rating the overheating would no doubt do considerable damage.

D. W. Burley, superintendent of transportation Binghams Railway, said that his company had converted some cars for one-man operation. These cars have a seating capacity of twenty-eight and carry loads of considerably over a hundred during rush hours. These cars are used in service with regular two-man cars and their introduction has not slowed up operation in any respect. The trucks have a long wheelbase and ride very easily. Originally iron wheels were used, but the railway is now changing to steel wheels and finds these much better as there is less chipping of flanges.

In reply to a question as to experience of railways

in operating over railroad crossings and the precautions that are necessary, Charles Brooks of the Poughkeepsie & Wappingers Falls Railway said that this company's cars operate over two such crossings. The procedure is for the operator to stop his car and go to the crossing so as to make certain that no train was approaching, then return to the car and cross as soon as possible. A trolley guard is used over such railroad crossings.

F. A. Stratton, president Peekskill Lighting & Railroad Company, said that the light cars save power as well as platform operation but that his experience showed them not to be adapted to snow conditions. A 7-cent fare is in force in Peekskill and the cars carry large loads over very severe grades. They keep up to schedule and operate well.

H. C. Page, general manager Worcester Consolidated Street Railway, said that ten Birney-type safety cars and one converted one-man car are operating in Worcester and that the operators seem to like the converted type even better than the Birney. The car has a large standing capacity, due to its longitudinal seating arrangement, and it is earning about 10 cents per car-mile more than the standard Birney car.

Hazard of Faulty Switchboard Construction*

Certain Factors Must Be Considered if Switching Apparatus in the Modern Power Plant Is to Be Installed with Due Regard to the Safety Feature

BY ROSCOE M. BERT

Electrical Superintendent Rockford Electric Company, Rockford, Ill.

THERE are many power plants in operation all over the country, with switchboards for 2,300 and 4,000-volt systems, which are entirely inadequate properly to perform the true function of a switchboard in emergency. There is now available considerable information as to what makes possible a reasonably safe switchboard under all conditions of short-circuited cables and busbars. To obtain proper safety the following points must be carefully considered: (1) Ultimate capacity of generators installed. (2) Reactance of generators when all are operated in parallel. (3) Proper location of external reactance to limit short-circuit currents. (4) Selection of an oil switch which will rupture the circuit under the worst possible conditions. (5) Proper arrangement of the apparatus to reduce life and fire hazards.

In many cases the point has been overlooked that any switch connected to a main busbar should have rupturing capacity equal to the total short-circuited capacity of all generators in operation, or at least should be protected by reactors to within the limit of the rupturing capacity of the switch, and, of course, protected by dependable relays.

In the past few years many stations of comparatively small capacity have made additions of large turbine generators and connected them to the existing switch equipment, and in many cases have "gotten by" with no serious results, but in others serious fires and accidents have occurred. As long as service is satisfactory and until an accident occurs we do not realize the dangers that exist. Recently this was very forcibly brought to

my attention at a property in Indiana. In this instance an oil switch short circuited and blew up, killing two men and destroying by fire half the bus structure, a quantity of cable and damaging several motor-generator sets. Property damages amounted to approximately \$20,000. Had the repair man and operator realized the danger and had sufficient apprehension as to possible results, the loss of life and most of the property damage could have been avoided.

As a result of this accident our engineers have decided completely to rebuild the switching equipment of the Rockford property and all others which are in an unsafe condition. All switches and busbars will be placed out of doors, using weatherproof apparatus completely. This has been done for some years for high-voltage equipment for 13,000 volts and above, so why not for 2,300 and 4,000-volt systems? The details of this scheme have not been fully worked out, but we have consulted manufacturers' engineers and they think it feasible.

Frequently switchrooms are partitioned off from all other parts of the power house, and are seldom seen by the operators. I would advise that openings be provided if possible that any incipient fire could be promptly seen by the station men. These openings should serve a further purpose, that is to allow men to escape in case a fire starts while they are working on the apparatus in these compartments.

Operators should be cautioned regarding accuracy in synchronizing of generators, as this is very severe service on switches unless done accurately. To improve this accuracy, I would recommend the use of a synchroscope with a very large dial and the cautioning of station men to take plenty of time in putting machines on the lines.

Bulletin on Employment of Women as Conductors

THE success of the employment of women street car conductors or ticket agents in Boston, Chicago, Detroit and Kansas City is described in a bulletin just issued by the Women's Bureau of the United States Department of Labor.

Conditions for street car conductors were not ideal, according to this report, but no reason was found to prove that the work of a street car conductor was not fit for women. Neither the history of the employment of women on street cars nor the many disputes which arose over their employment were sufficient reasons for the final decision of the men's union that street car conductor's work was "unfit for women."

The discharge of many women ticket agents as well as conductors of the street railways of New York City in 1919 was the reason for the making of this study, as the Department of Labor did not consider these companies justified in the claims that they could not employ women and adhere to laws which had been passed regulating their hours of work. In conclusion the report states, "records from Chicago and Boston show that with the eight-hour day and six-day week, without night work, and with a wage far superior to that paid women in many other occupations, the woman ticket agent and collector is an accepted and permanent fact in two large cities. The fact that these conditions are far better than those prescribed by law in the same communities shows that some other contributory factor must be present when women are dismissed from this work because of the requirement for them of reasonable hours of work."

*Abstract of paper presented before the Illinois Electric Railway Association in Chicago, March 16, 1921.

Electric Locomotives for the Austrian State Railways

Four Types of 15,000-Volt, Single-Phase Locomotives Have Been Designed to Meet the Various Conditions of Traffic Requirements, Topography and Track Limitations

BY ARTHUR PALME

THE reasons which prompted the Austrian State Railways long before the war to electrify its roads hold true in a far greater measure for the new republic of Austria. The former Austrian monarchy was rich in coal, so that electrification of its railways was based almost exclusively upon the relative cost comparison between steam and electric traction. Today, as the republic can supply only 16 per cent of its coal requirements, it is under the necessity of electrifying all of its roads, thereby to maintain its railroad traffic and industries more nearly regardless of the high price of imported coal and the irregularity of its supply.

In the bill passed in July, 1920, the electrification of 40 per cent of all the main roads of the republic was specified. The lines included in this bill were enumerated in an article in the March 5 issue of the ELECTRIC RAILWAY JOURNAL by E. C. Zehme. Work has already begun on one of the most important of these lines, the Arlberg line from Innsbruck to the Swiss frontier near Bregenz.

Austria shares fully the general middle European railroad dilemma; that is, the doubt as to the most favorable system to adopt. Extensive studies of a general character and of the specially required best solution, however, led finally to the selection of the alternating-current, single-phase system with the low frequency of 16 2/3 cycles per second at an overhead wire

tension of 15,000 volts. The possibility of using three-phase current was not seriously considered on account of the much higher investment cost. One of the main reasons why high-voltage direct current has been eliminated is the lack of European experience with this system, and the necessity for extensive developmental and experimental work on the part of the Austrian and German electrical concerns in connection with this system, whereas all details for the alternating-current system had been developed and well tried.

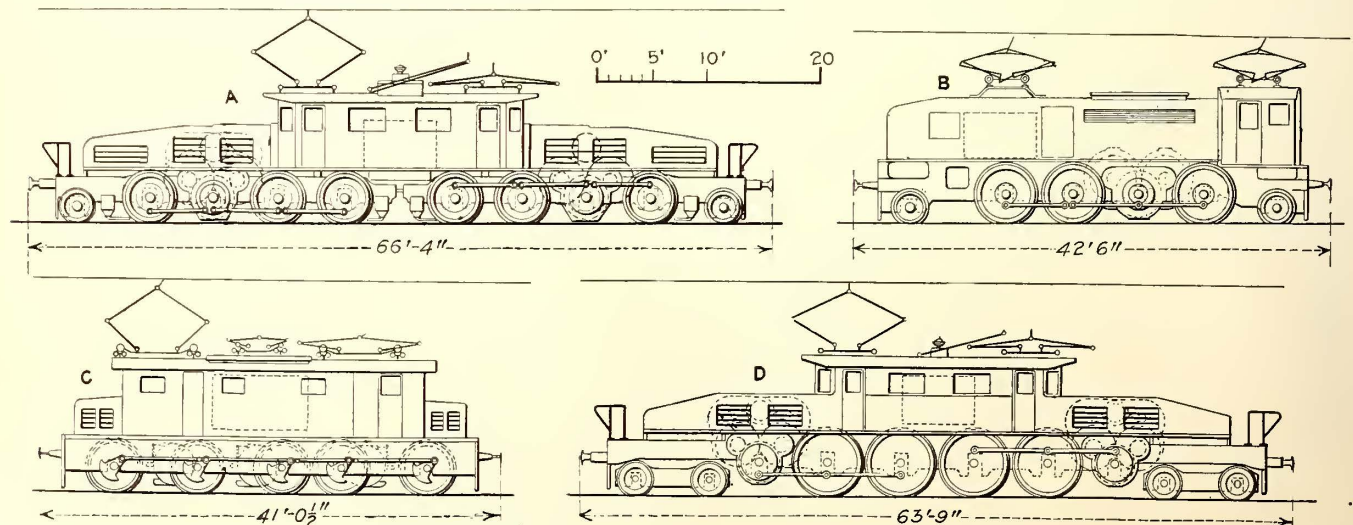
The topographical character of the planned lines is diversified. While there are, the typical mountain stretches with grades as steep as 3.14 per cent and unfavorable right-of-way, there are also long stretches of down grades so straight that speeds up to nearly 60 m.p.h. are being reached now with steam locomotives. In addition, very different traffic requirements exist on the various lines. For that reason four types of electric locomotives have been ordered to take care efficiently of the different kinds of service required by fast and slow passenger traffic and freight service. In order not to overload the present rails and some of the old bridges a limit of 16 tons axle pressure and a locomotive weight of not exceeding 2.3 tons per foot of over-all length have been established. All locomotives are built safely to round a curve of 500 ft. minimum radius. They will all be equipped with alternating-current series commutator motors, operating on a voltage reduced from 15,000 to 400-1,300 volts, transmitting their power to the drivers directly by gears or by gears through a jack-shaft to coupling rods. All locomotives will have the automatic vacuum braking system, customary in Austria.

The following types of engines have been standardized and ordered:

DATA ON LOCOMOTIVES FOR AUSTRIAN STATE RAILWAYS

Type	Weight, Tons	Length, Ft.	Horsepower		Dia. of Drivers, In.	Gear Ratio	Motor Voltage	Transformer		Capacity
			Contin-uous	One-Hour Rating				Rating, Kva.	Voltage	
IC + C1	127.5	66.3	2,000	2,460	53	1:3.2	575	2,000	15,000/1,240	396 tons at 31 m.p.h. on 2.64% grade 330 tons at 28 m.p.h. on 3.14% grade Maximum speed—40 m.p.h.
IC1	76	42.5	780	1,100	63.5	1:4.0	520	800	15,000/1,050	330 tons at 25 m.p.h. on 1.4% grade 220 tons at 21.5 m.p.h. on 2.5% grade Maximum speed—40 m.p.h.
E	80	41.0	.....	.....	57	1:6.3	...	850	15,000/440	1,100 tons at 18.5 m.p.h. on 0.8% grade Maximum speed—31 m.p.h.
2BB2	108	63.7	...*	.....	.....	.....	...*	...*	15,000/*	495 tons at 18.5 m.p.h. on 1.5% grade 638 tons at 25 m.p.h. on 1.0% grade 715 tons at 50 m.p.h. on level Maximum speed—62 m.p.h.

* Electrical data not yet fully determined



SIMPLIFIED ELEVATIONS OF THE FOUR TYPES OF AUSTRIAN LOCOMOTIVES

1. Express locomotive for mountain passenger service, class 1C + C1.
2. Passenger and freight locomotive for medium mountain road service and light freight, class 1B1.
3. Heavy freight traffic locomotive for level and mountain roads, class E.
4. Heavy express passenger locomotive for level and medium mountain service, class 2BB2.

The principal characteristics and outstanding features of these locomotives are shown in the accompanying table and illustrations. In general the same characteristic type of construction prevails, that is side rods driven from a jackshaft to which the motors are geared. However, the mountain freight type of locomotive differs from the other three designs in the detail that the motors are geared directly to the wheels, while all

five axles are rods coupled. The 1C + C1 type will be used for pulling through trains over the steep grades of the Arlberg road.

In order to permit starting of electric operation before all roads are completely electrified, a number of battery-car trains are being built, each consisting of the battery car in the middle of the train and two passenger cars on each end. Two of the passenger coaches are trailers and two are motor cars which have a total motor output of 190 hp. at a normal speed of 22 m.p.h.

The batteries to be used weigh 20 tons and have a capacity of 222 amp.-hr. at 520 volts. The capacity of such a train, which is for auxiliary purposes and short distance only, will be 176 seated and 130 standing passengers.

Wisconsin Association Meets

**Safety Car Operation and Construction, Street Railway Rates and
the Use of Weekly Passes Are the Main Topics
Discussed by Railway Members**

IN JOINT meeting with the Wisconsin Gas Association, the Wisconsin Electrical Association met in its thirteenth annual convention on the afternoon of March 23. This session of the association was presided over by William C. Lounsbury, Superior, Wis., president of the electrical association, and it was occupied with broad utility matters. The meeting was addressed by Charles B. Scott, member of the national safety committee of the National Electric Light Association and general manager Bureau of Safety, Chicago, on some of the hazards of the electrical business and how to guard against them. A report on the work of the Wisconsin Public Utilities Bureau, organized during the past year for the purpose of spreading information about the public utilities to the public, was made by Frantz Herwig, director. R. V. Prather, secretary of the gas, electric and electric railway associations of Illinois and of the Great Lakes Division of N. E. L. A., read a paper setting forth in very able manner the various aspects of the need for associations of public utility companies, the purposes of such organizations and the obligations of the companies to them.

A banquet at the Pfister Hotel on the evening of March 23 concluded the joint convention. N. J. Whelan acted as toastmaster of this function and Edgar A. Guest was the speaker of the evening. A good deal of entertainment was afforded to the members by the distribution of several articles as gifts to different members of the association.

The Wisconsin Electrical Association held a separate meeting on March 24, at which time the president's annual address was read and various committees made their reports. Speaking of the railway situation, President Lounsbury said: "The street railway situation is not nearly as discouraging as it has been for the past few years. In many places it is indeed dark. The truck, the pleasure car and the former rapid expansion of lines increasing the long haul, together with the extremely high operating expenses, have been disastrous in their consequences, but from the confusion

comes a realization of the importance of the street car and a better public appreciation of its worth to the community."

For the steam road crossing committee, C. R. Phenicie, Wisconsin Public Service Company, reported that the Wisconsin Railroad Commission had done an extensive work in classifying all crossings and tabulating them with the clearance, grade, angle, protective devices used, etc., all of which was considered to be of little value to the electric railway. He said that an effort had been made to co-operate with the steam railway officials who had this matter up before the commission, but the latter had refused to co-operate. The committee advised the association to recommend to the commission that a whistle post be installed on the approach of all steam line crossings with electric railways, and that trains be required to slow down to 25 miles per hour for the crossing. In discussing this report, which was adopted by the association, Dudley Montgomery brought out that it is the practice on his property in Madison, Wis., for the motorman to flag his own car in all cases, two-man as well as one-man cars. He does this by getting off his car and running across the tracks to make observation.

Several brief papers on one-man car operation were then read by Messrs. Arnold, Howard, Montgomery and Phenicie. Some of these appear in abstract in this issue and the others will be published later. In the discussion which followed, Mr. Montgomery took issue with the question raised by one of the speakers as to the use of the name "safety" in connection with the small one-man car. He said that the car had well earned its name, for the number of accidents had been very greatly reduced as compared with any other type of car. He said also that many companies had always wanted to use one-man operation but were not able to do so until the safety devices were invented.

H. A. Mullett, Milwaukee, spoke briefly of the use of safety cars in Racine and Kenosha, Wis. He pointed out that the design of these cars had included double

flooring, side sheathing and head lining, steel wheels instead of cast, hot-air heaters instead of electric, and spring-cushion seats. He said that the standard width door, 30 in., had been used thus far, but the company had some feeling that a wider door would be better. He spoke also of the present consideration given to the air system to prevent freezing, and said that not a single case had developed during the past winter. Since the installation of safety cars in these two cities, there has been such a falling off in the general business handled by the company, that Mr. Mullett said it was impossible to make any comparison as to the savings, increase in business developed by the more frequent headway, etc.

He spoke of the weekly pass which has been in use in Racine for two years and was recently adopted in Kenosha as well. The principal advantage claimed for this unlimited pass is that it promotes the habit of riding and encourages riding, particularly during the off season. During the winter of 1920 the company sold about 2,000 passes per week, the revenue from which amounted to about 15 per cent of the total. During the summer, when the amount of traffic always falls off in Racine, the number of passes sold averaged about 1,300 per week, which accounts for 10 or 11 per cent of the total revenue. For the first three months of this year 2,200 passes per week have been sold, approximately 20 per cent of the total revenue coming from this source. Mr. Mullett said that these passes are very popular in Racine. They are sold for 98 cents to the trainmen, who distribute them to the riders for \$1 each. He said it has been impossible to determine definitely how much increase in riding has been fostered by the use of these passes, but mentioned the fact that many downtown restaurants had protested because a good many of their customers were now going home to lunch.

W. H. Sawyer, president East St. Louis & Suburban Railway, made a plea for companies to hold to the standard design of safety car, because of the many advantages accruing from the reality of standardization. He ridiculed the contention of "local conditions" often used to support an argument for a different design.

Mr. Sawyer then presented a paper on street railway tariffs, in which he reviewed the study and findings of the committee on fares of the American Electric Railway Association and gave the result of some recent investigation on his part as to the results obtained from the inauguration of 10-cent fares in various cities. His principal conclusion was that higher fares do produce increased revenue, and that where the rate of fare must be above 5 cents, a 10-cent cash fare with reduced ticket rates is the best form of tariff. His paper will appear in abstract in a later issue.

The following officers were elected to conduct the affairs of the association for the ensuing year:

President, J. P. Pulliam, vice-president in charge of operation Wisconsin Public Service Company, Milwaukee, Wis.; first vice-president, Harold L. Geisse, Milwaukee; second vice-president, P. D. Kline, vice-president Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis.; third vice-president, Harry R. Ellis, vice-president and general manager Eastern Wisconsin Electric Company, Sheboygan, Wis., and secretary, W. M. Chester, 1408 First National Bank Building, Milwaukee, Wis., assistant to Mr. Pulliam in the Wisconsin Public Service Company.

Why Not the One-Man Car?

BY B. W. ARNOLD

Manager Eastern Wisconsin Electric Company, Oshkosh, Wis.

THE name "safety car" as applied to this new type of car operated by one man I feel is an error, because there is no such thing as a safety car any more than there is a safety shot gun or safety revolver. Either is safe if properly handled, but neither is safe if improperly handled. Accidents will always continue to occur as long as they are in use. Can you imagine the feeling of some poor chap who has been unfortunate enough to be struck by a car and knocked to the side of the road and, while lying there waiting for the ambulance, he sees in large letters on the front of the car the words, "safety car"?

I am heartily in accord with the different safety devices which have been installed on this new car. The feature of the emergency action from letting go of the controller handle and the handling of doors and steps by engineering valve are both a distinct development in the art of car control and of great benefit in preventing accidents. But to operate all of these safety devices we again revert to the human element, and that, as we all know, is subject to failure as are mechanical devices. I therefore see no need of any departure from the old honored name of "street car" when this new car is placed in operation in any community.

Some opposition has been encountered in some parts of the country to the operation of street cars with one man, but I feel this is simply another problem for the local management to work out and sell to the public. With the fine results obtained in so many cities, this should not be such a hard problem at this time.

That the light-weight car operated by one man has passed the experimental stage and is here to stay cannot be doubted, as the large number of these cars in operation and on order proves that the public is for them. I have always felt that a motorman and conductor on cars operating in cities up to 100,000 population, except perhaps on some heavily traveled lines, is an economic waste. When the motorman is at work the conductor is idle, and when the conductor is at work the motorman, to use the expression of the South, is "just standin' round." The new car eliminates this loss.

The proper method of flagging steam railroad crossings is a matter to be worked out by local managers with the aid and advice of the railroad commission engineers. On our property we require the operator to bring the car to a stop at a sufficient distance from the crossing to insure gate clearance. He then leaves the car and goes to the center of the crossing for observation before proceeding. By this method he not only flags the crossing with his eyes but with his ears as well. By requiring him to leave the car one makes certain that he will stop for the crossing.

APPLY SALESMANSHIP TO CAR RIDES AS WELL AS TO POWER

Mr. Street Railway Manager, you have something to sell, namely, rides on your cars. At Christmas time, when you are booming the sale of electric washing machines, irons, open gas grates, etc., your new business department has beautiful ribbons and holly tied on them. But you totally forget to put any of that holly or ribbon in your street cars when they start

*Abstract of paper presented before Wisconsin Electrical Association, March 24, 1921.

out to bring in more nickels than the profit from the sale of all the appliances for the entire month.

Give the street railway an equal chance with the remainder of your business. Provide careful, courteous operators for your cars; have them clean and on time, all the time, not some of the time. In other words, sell your service to the people in such a way that they will want to buy it, and with the savings possible by the new type of car the figures on your balance sheet will be more pleasing at the end of the month.

One-Man Operation Is Very Desirable*

BY R. M. HOWARD

Vice-President Wisconsin Railway, Light & Power Company,
Winona, Minn.

MOST of the discussions we hear revolve around the light-weight single-truck car equipped with safety devices, and the tendency has perhaps been along the line of unduly emphasizing the importance of the car rather than the principle of one-man operation. Possibly it has been necessary to do this in order to establish one-man operation, and if so, perhaps we have been poor salesmen in selling the one-man operation idea to the public.

The primary idea of one-man operation is to keep the total cost down to the point where we can sell a ride to the public at a price that will encourage the use of our facilities. If we can only put this idea over to the public and secure the full co-operation of the public, one-man operation will need no defense, and it will become the standard everywhere except in zones of heavy traffic.

As I view one-man operation, the only valid objections that can be made by the public refer to time required to make change and slightly longer time required for loading at heavy traffic points. The odd penny fare complicates change making, and possibly a cash fare for transient and occasional rides sufficiently higher than the regular ticket rate to encourage the use of tickets by say 80 per cent of the riders may be the solution of the fare question.

The delay at loading points is very slight; it seldom has any effect on the schedules, and if the riders can be brought to the realization that the slight inconveniences mentioned insure the maintenance of a lower fare than is possible with two-man operation, it will not matter whether single or double truck cars are used.

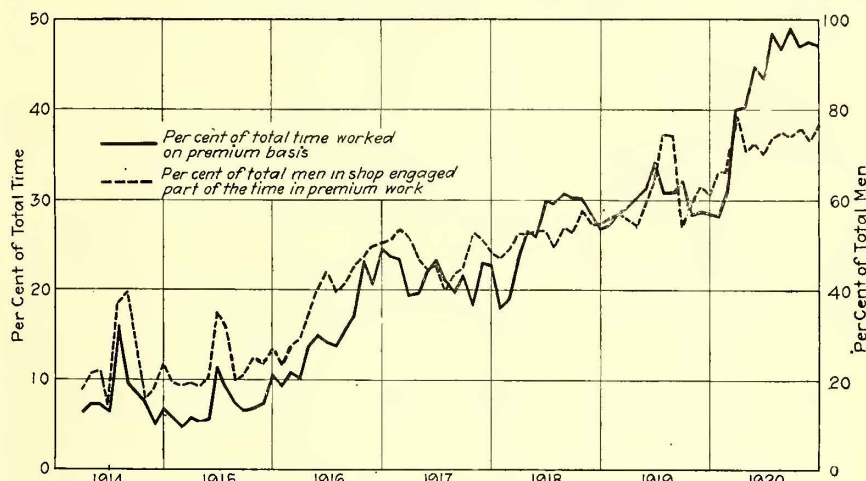
I believe the time is past due for the inauguration of one-man operation on many lines using double-truck cars. We are all suffering from a heavy reduction in earnings. We are carrying a heavier platform wage scale than was ever contemplated when our industry was developed. We are passing through what is politely called an adjustment period. The best adjustment we can make is along the lines of greatly extended use of one-man operation with such cars as our financial situation permits.

I do not want to convey the impression that we are opposed to safety cars, as the reverse is true, and our last purchase was standard safety cars which are operating very satisfactorily.

If the present depression continues we will have to follow the downward curve of earnings with a corresponding drop in operating expenses, and inability to finance or the time required to secure new cars if money is available for their purchase may compel the use of existing equipment with one-man operation.

Results of Premium Wage Plan

IN THE article by J. H. Lucas describing the premium wage plan used in the Milwaukee Electric Railway & Light Company's shop, which was published in the ELECTRIC RAILWAY JOURNAL for March 19, page 529, reference was made to the percentages of the total force engaged on premium work and to the percentage of man-hours time for work done. The accompanying graphs which were omitted from the previous article served to give a picture of present conditions and the increase that has been made since 1914. At the present time 76 per cent of the working force is engaged part



GRAPHS SHOWING INCREASE IN THE APPLICATION OF THE PREMIUM SYSTEM TO SHOP WORK IN MILWAUKEE

of the time on premium work and nearly 50 per cent of all the man-hours time in the shop is for work done against standard time allowances and in a standard manner. The figures taken for arriving at these percentages of working forces and hours are total figures, which include the supervisory time as well as the time of the productive workers. These graphs also show that, due to the necessity for preparatory observations in establishing standard times for the various operations, the extension of the premium system must be gradual and somewhat slow at first.

New International Association Formed

THE organization of the new international association of street and interurban railways, mentioned on page 228 of the issue of this paper for Jan. 29, has been completed. The countries included are those in Central Europe. The president is L. Spängler, director of the Municipal Railway in Vienna, and the vice-president is Dr. Wussow, general manager of the Berlin Street Railway System. The members of the executive committee are: J. F. S. Barth, Christiania, Norway; W. von Chätel, Budapest, Hungary; E. Hultman, Malmö, Sweden; Paul Libowitzky, Oderberg, Czechoslovakia; Kai Norregaard, Copenhagen, Denmark, and T. E. van Putten, Amsterdam, Holland. The secretary is Dr. A. Ertel of Vienna.

*Abstract of paper presented before Wisconsin Electrical Association, March 24, 1921.

Association News

Equipment Committee Holds Busy Session

A TWO-DAY meeting of the equipment committee of the Engineering Association was held at association headquarters on March 23 and 24. The first day of the meeting was taken up with a discussion of the various subjects by sub-committees and the second day with general reports and discussions before the entire committee. Those present were: Daniel Durie, West Penn Railways, chairman; W. S. Adams, the J. G. Brill Company; H. A. Benedict, Public Service Railway of New Jersey; R. H. Dalgleish, Capital Traction Company; James C. C. Holding, Midvale Steel & Ordnance Company; T. R. Langan, Westinghouse Electric & Manufacturing Company; F. H. Miller, Louisville Railway; C. N. Pettinger, Steubenville, East Liverpool & Beaver Valley Traction Company; E. D. Priest, General Electric Company; C. F. W. Rys, Carnegie Steel Company; C. F. Scott, General Electric Company; Karl A. Simmon, Westinghouse Electric & Manufacturing Company, and C. W. Squier, ELECTRIC RAILWAY JOURNAL. In addition to the regular members of the equipment committee, representatives of various manufacturers were present at the invitation of the committee to assist in developing standards for steel wheels, cast-iron wheels and gearing.

The work of revising the association standards for tread and flange contours for steel wheels and preparing a standard wheel contour for cast-iron wheels received considerable attention. This work is progressing very satisfactorily.

The American Gear Manufacturers' Association has drawn up a specification for gearing which is nearly the same as the present standard employed by the association and it is thought that the two specifications can be harmonized without undue difficulty.

In connection with the study of helical gearing which the committee is making, engineers from the General Electric Company presented an interesting demonstration with full-sized models to illustrate the effect of various degrees of helix angle and varying width of face. Representatives of the Westinghouse Electric & Manufacturing Company and of the R. D. Nuttall Company were also present and gave the committee the benefit of their experience in connection with the use of helical gears.

The sub-committee appointed to study the life of wearing parts and to report on shop practices relating to improving wearing qualities of parts is to obtain information from a large number of properties through personal observations made by members of the equipment committee. In order that the type of information obtained may be uniform, a questionnaire was outlined for the use of members only. It seemed probable that a reel or two of motion picture films could be arranged for presentation at the convention to illustrate the best manner of carrying out certain operations that would be of benefit in providing longer life and the chairman of this sub-committee is to obtain opinions regarding practices that appear desirable to have illustrated.

The sub-committee which is studying the present status of direct-current lightning arresters has formulated a questionnaire which will be sent out to all member companies to obtain additional information regarding this subject.

In connection with the design of a typical shop building, decisions were reached as to the number of departments and their relative size that should be accommodated and also various details of construction for convenience, safety and efficient handling of work. Studies have been made of about twenty-five shops and much valuable information is being tabulated. This sub-committee is working in conjunction with the committee on building and structures.

Work of Advertising Section Ready for Distribution

THE Advertising Section of the Division of Information and Service, American Association, has prepared for distribution various pieces of advertising material which member companies may obtain upon application.

The findings and recommendations of the Federal Electric Railways Commission have been epitomized and prepared for distribution in three different forms. There are two cards printed on stiff cardboard, one for wall display, containing briefly the findings and recommendations of the commission, and another a small card for desk use, containing the recommendations only. These cards will be supplied free in any amount to companies desiring them.

A series of fourteen suggested car signs have been prepared in miniature form and may be had free of charge upon application.

Six suggested newspaper advertisements presenting various phases of the Federal Electric Railways Commission report and other material of publicity value to electric railways are in readiness for free distribution upon application.

Two leaflets, "How to Keep the Hired Help on the Job" and "Right Over the Plate," also are ready for distribution. The first of these contains a series of seven constructive suggestions by Paul P. Haynes, a member of the Indiana Public Service Commission, that are of great publicity value. The other leaflet, "Right Over the Plate," is devoted to President Harding's views on the electric railway situation. The outside of the leaflet carries a reproduction of a picture of the President in the attitude of pitching a baseball, which, linked with the title of the leaflet, makes a very attractive and effective cover design. Both of these leaflets are being sold at cost, which ranges from \$2.50 to \$3 a thousand, depending upon the quantities on order whenever it is deemed advisable to go to press. Approximately three-quarters of a million of these two leaflets have already been ordered. The Advertising Section also has available a summary of all references to electric railway affairs which the various state Governors made in their inaugural or initial messages to their Legislatures this year.

In addition to supplying copy and making suggestions for copy to companies, the Advertising Section is very glad to give suggestions or advice in specific cases when it is desired. Companies that are planning an advertising campaign or are preparing advertising literature can have it reviewed by the Advertising Section upon request.

Accident and Claims Statistics Discussed

ON MARCH 30 the committee on claims statistics met at association headquarters. It was brought out that since last July nearly 150 requests for information on accidents have been answered by the bureau of information. The statistics collected by the committee last year had been the means used to answer these inquiries. In view of the completeness of this data, it was believed that the expense involved in duplicating the information by a further request at this time was unwarranted.

Those present at the meeting were C. F. Briggs, Public Service Railway, chairman; W. F. Weh, Cleveland Railway, and J. S. Kubu, New York State Railways. J. W. Welsh, acting secretary of the association, was also present.

T. & T. Executive Committee Hears Progress Reports

ON MARCH 25 the Transportation & Traffic Association's executive committee held a meeting to hear reports on how the work of the various committees was progressing. It is planned to have all reports in by July 15 so that they can be printed and distributed well in advance of the convention.

Those present in addition to President R. P. Stevens were L. H. Palmer, United Railways & Electric Company of Baltimore; G. T. Seely, Pennsylvania-Ohio Electric Company; J. K. Punderford, the Connecticut Company; T. C. Cherry, Rochester & Syracuse Railroad; J. V. Sullivan, Chicago Surface Lines, and J. W. Welsh, acting secretary. The following committee chairmen read brief reports as to how the work assigned to their committees was progressing. H. B. Flowers for the committee on traffic regulations; J. P. Barnes for the committee on personnel and training transportation of employees; F. W. Coen for the committee on express and freight traffic promotion and costs; G. T. Seely for the committee on merchandising transportation; H. C. Mosher for the committee on economics of schedules; R. E. McDougall by letter for the joint committee on safety.

The resignation of E. B. Burritt as secretary-treasurer was accepted and J. W. Welsh was elected acting secretary to hold office until such time as the American Association elects a permanent officer.

The committee discussed to some extent the light-weight one-man car now rather extensively used throughout the country. In view of the wave of legislation that has recently developed against this type of car, the committee deemed it advisable to call up the whole question of one-man cars before the American Executive Committee at its meeting April 12 for definite recommendations as to what if any further study can be made by the association.

Safety Committee Holds Enthusiastic Meeting

ON MARCH 28 the joint T. & T. and Claims Association committee on safety held its second meeting of the year at association headquarters. Those present were E. C. Spring, Lehigh Valley Transit Company, and R. E. McDougall, New York & Harlem Railroad, co-chairmen; H. O. Allison, Beaver Valley Traction Company, proxy for W. H. Boyce; J. S. Kubu, New York

State Railways; C. B. Scott, Chicago Edison Company; A. J. Van Brunt, Public Service Railway, proxy for H. V. Drown, and W. F. Weh, Cleveland Railway. J. W. Welsh, acting secretary, also attended the meeting.

Representatives of the National Safety Council appeared before the committee and explained plans they had in mind for entering the public safety field and asked the committee for its moral and financial support by urging electric railway companies to take out membership in the council. The committee believed that the good results could be obtained by making the joint safety committee a permanent standing committee and the clearing house for the dissemination of information concerning safety work among electric railway companies.

It is hoped that a joint session of the T. & T. and Claims Association can be arranged at the coming convention for the purpose of discussing fully safety work as recommended by the committee and now being conducted by various electric railway companies, not only as it affects its own employees in the shops but the public as well.

Another meeting of the committee is planned for May 10, at which time it is hoped to complete the report.

Meeting of Chicago Elevated Section

THE Chicago Elevated Railroad Company Section met March 22 with about 185 members in attendance. J. H. Mallon, president, occupied the chair. The address of the evening was by A. L. Gardner on the subject of railroad taxation and the speaker described the various taxes which a railroad pays on its different classes of property. There were also two or three musical numbers presented by the Oak Park Trio and William G. Wood, with dancing by Messrs. Ryan and Coleman.

Camden Section Hears New Traffic Ordinance Explained

THE monthly meeting of the Public Service Camden section was held on March 18 at the Newton Avenue carhouse. The guest of honor and speaker was Frank S. Van Hart, president of the Camden City Council. Mr. Van Hart spoke principally on the traffic situation in Camden, explaining the new traffic ordinance in detail. He said the ordinance was designed for the good of the people and the city as a whole and not to favor any particular class.

Mr. Van Hart commended the drive being made by the trainmen to make a better public feeling for the company and said that not only he but also many of his friends had noticed a great improvement in the manner with which trainmen had handled the public in the last few months. He cited actual examples of how trainmen had gone out of their way to please the patrons of the trolley company. Mr. Van Hart also explained that the City Council was always open to new suggestions or criticisms in relation to the new traffic ordinance and would welcome any communications from the trainmen. The Council realized it was impossible to have the ordinance perfect at first, but it felt that after the present arrangement was tried out, additions and betterments would be suggested and put in force to give Camden the reputation of having the best regulated traffic in the country.

Recent Happenings in Great Britain

Wage Court Recommends Continuation of Present Wages Until Dec. 31 Next—Cost of Proposed Glasgow Electrification Found to Be Prohibitive

(From Our Regular Correspondent)

The report of the Court of Inquiry to the Minister of Labor was published on March 8. It says the wage increases have not advanced at the same rate as the cost of living figure. The claim for increase of wages was made last October. Since then the cost of living figure has both risen and fallen. The court cannot predict its future movements. It recommended that the present wage standard should be maintained until Dec. 31 next; that the Industrial Council for the industry should consider the question of standardization, having regard to the earning capacity of the undertakings and to the interests of the public, and that the Council should examine the circumstances of the lower-paid grades with a view to adjusting their conditions on a more satisfactory basis.

IN THE opinion of the board, the Council should also examine the position of those undertakings which have not observed previous agreements and arbitration awards, and those undertakings should be advised that if possible the advances should be paid in full.

It remains to be seen what action the Ministry of Labor and thereafter the tramway employees will take. If the proposals are adopted by all parties there will be peace till the end of the year. By that time the cost of living may have further declined.

The claim of the tramway men was for an increase of wages of 12s. a week. The court of inquiry was set up by the Minister of Labor. The hearings consumed about ten days of time, spread over a period of several weeks. They were concluded on Feb. 18.

NO ELECTRIFICATION PROJECTS

The few references to electric traction made by the chairman of British steam railway companies at the annual meetings of shareholders held during February show that while the existing stringent financial and economic conditions endure there is little or no prospect of any new electrification work being carried out. The London, Brighton & South Coast Railway has tried, but so far without success, to get sanction from the Government for completing the electrification of its system. It was revealed by the chairman of the Caledonian Railway that the directors had considered the question of converting their underground lines in Glasgow and some of the adjacent suburban lines, but that the cost and the prospective traffic did not warrant the change.

While the chairman of the London & South Western Railway was able to say that the electrification of the company's suburban lines continues to be an immense success, he stated that the projected conversion of other lines further out of London has in the meantime had to be dropped. When the directors wanted to place contracts for two of these lines (Cobham and Leatherhead), they found that the cost of electrical equipment had advanced to such an extent as to make it very doubtful whether the work could be carried out for £1,000,000, as compared with a pre-war estimate of £250,000. All the com-

panies are, in any case, pledged to abstain as far as possible from new capital expenditure until future conditions and the intentions of the Government with regard to the railways are more fully known. In regard to the completion of the electrification of the suburban lines of the London & North Western Railway, which was stopped owing to the war, that work is in progress, and it is hoped that early next year the new lines will be opened, so that electric trains will run out of and into Euston Station.

DIVIDEND REDUCED IN 1920

The dividends paid by the group of London underground electric railway companies for the past year are even lower than usual, due to the increased cost of labor and materials. It is true that the companies last summer obtained parliamentary authority to raise fares, but the higher charges were in operation only during the last four months of the year. The records for these four months, however, are so encouraging that Lord Ashfield, presiding at the annual meetings of the companies (which were all held on Feb. 17), was able to take a fairly optimistic view of the future. He based himself, not only on the fact that the increased fares have produced a rise in revenue, but also on the confident expectation that the peak has been reached in wages and cost of materials. He thus looks forward both to larger revenue and smaller expenditure. The former may, however, be delayed by the present trade depression. Another encouraging feature is the beginning of co-operation with the London County Council Tramways—a matter to which I have referred in recent articles in these pages.

Lord Ashfield made a comparison of the receipts during the first three and the last three months of 1920, during the latter of which periods the increased fares were in force, and the results are interesting. (It may be recalled that the minimum fare was raised from 1d. to 1½d., with smaller proportionate increases for the longer distances.) On the associated railways the average receipts per passenger rose from 2.2d. to 3.0d. Taking some of the line separately, on the Central London Railway the receipts increased by 35 per cent,

on the City & South London Railway by 30 per cent, and on the London Electric Railway by 27 per cent. In most cases there was a slight decrease in the number of passengers. The London General Omnibus Company, which is associated with the underground railways group, shows a deficit on the year's working, but the receipts for the last three months of the year showed an increase over the first three months of 23 per cent. Lord Ashfield is hopeful that matters will so improve that the railway companies will soon be able to raise the additional capital which they require for carrying out various authorized extensions and improvements. At the annual meeting of the Underground Electric Railways, London, Ltd. (the holding company), held on March 3, Lord Ashfield was even more optimistic as to the future.

REORGANIZATION PLANS CARRIED OUT

In connection with the London General Omnibus Company it may be of interest to note the increased cost to the company of the recent transfer of taxation from petrol (gasoline) to the vehicles themselves. In 1920 the amount paid in petrol duty was £141,000, while police licenses for the omnibuses cost £17,000 in addition. For the present year the new taxes, which come in lieu of the petrol duty, have been paid to the amount of £229,000. As this tax is charged by the year, the figure mentioned represents the great bulk of the sum which was chargeable in 1921.

The associated London underground railway companies and omnibus and tramway companies have just carried out a reorganization of their administrative staff on very thorough and comprehensive lines. Lord Ashfield remains chairman and managing director of all these companies.

A remarkable expansion of traffic on the Great Northern & City Railway during recent years was mentioned by Lord Aberconway, chairman of the Metropolitan Railway, at the annual meeting on Feb. 10. The Metropolitan Railway, which is quite separate from the London "combine," and is partly a steam system, took over the Great Northern & City line, which is a tube railway, in 1913. Since then the number of passengers has increased by 75 per cent, and the fares now are nearly double those charged eight years ago.

SIR ERIC TO RETIRE

It was officially announced in the House of Commons on March 4 that in August next, when the period of state control of British railways comes to an end, Sir Eric Geddes, Minister of Transport, will retire from office. He is at present engaged in the important work of trying to come to a financial settlement with the companies before the railways are handed back to them, and very large sums are involved. Sir Eric who is not a politician, wished to retire some time ago, but was dissuaded by the Government, which values his services as a railway expert very highly.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Segregation Recommended

Citizens' Committee Wants the Railway Returned to Local Control
—Court Urges Conference

The Citizens' Committee of Forty, with Hugh McCloskey, former president of the New Orleans Railways & Light Company, New Orleans, La., as chairman of the advisory committee, has submitted its findings on the utility matter to Judge Foster of the Federal District Court. It is a lengthy document. The report was indorsed by every member of the committee save one, Robley S. Stearns.

Among the recommendations made by the committee, which has been at work more than a month seeking to find a solution for the traction troubles of this city, are that the gas plant and the railway should be divorced, the city being given the option to acquire the railway plant. The committee disapproves the service-at-cost plan, but finds that it is impossible to operate the lines at a fare of less than 7½ cents under present conditions and recommends the issuance of railway tickets at the rate of ten for 75 cents.

RAILWAY WORTH \$26,000,000

After considering the valuation placed upon the property of the New Orleans Railway & Light Company by the various experts who have been called in to estimate its worth the committee arrives at the conclusion that the railway proper is not worth more than \$26,000,000; the light and power establishment \$10,000,000 and the gas plant \$8,500,000. Wide latitude is recommended in the readjustment of the franchises, tracks and schedules of the railway so as to insure more economical management and better service.

The committee says that the utility to be able to furnish adequate service should be put on a sound financial basis, and that the management should enjoy the confidence, respect and good will of the people of New Orleans. On this point it says:

To accomplish this much-to-be-desired result your committee first of all recommends that steps be taken which will absolutely insure strictly New Orleans control and management, and will make it impossible for outsiders to gain control of the new corporation for the purpose of displacing the management and perhaps run the company for their own selfish ends, to the great injury of all the elements of our community.

It will not be difficult to work out a plan which will prevent such a recurrence and the committee will be glad to submit its ideas on this subject in detail in due time. In the meantime we merely wish to suggest that five New Orleans citizens in whose integrity and judgment the public has absolute confidence should be selected as "trustees" charged with the duty of selecting and maintaining a reliable and efficient management for the reorganized company.

The minority report of Mr. Stearns holds that the underlying bonds, approximately \$11,000,000, should be recognized dollar for dollar; that the \$23,000,000 of other major securities should be recognized at what was paid for them; namely, about 80 cents on the dollar, and that the common and preferred stock, about \$30,000,000, par value, should be considered lost by bad management.

Judge Foster invited the members of the Commission Council to meet him and representatives of the advisory committee on March 28 to try to formulate some definite plan of action looking to a solution of the trouble.

Frankford Elevated Operating Contract Up Again

The terms of operation of the Frankford elevated by the Philadelphia Rapid Transit Company are again up for consideration. It seemed probable that the matter would go before the Council on March 31.

Agreement appears to be general that a fare much higher than 5 cents would have to be charged if the road were run by the Philadelphia Rapid Transit Company separate from its other lines and that if the new line were tied in with the present system the rate of fare now in effect for the entire city would have to be increased slightly.

It has been indicated that the Philadelphia Rapid Transit Company, if it is to operate the new line, would want to put into effect at once an increase in its present fare, although the elevated line is not expected to be ready for service until about January, 1922. In this way it might be possible to accumulate a fund against the deficit in the operation of the elevated which is regarded as certain to follow when the line is placed in operation.

The attitude of the Philadelphia Rapid Transit Company on the matter is reflected unmistakably in a letter from President Mitten to the Mayor. Mr. Mitten said:

Since our meeting of yesterday I feel that I should now state that, with the approval of the Public Service Commission, I am willing to undertake the added burden imposed by the Frankford "L" and Bustleton line, without increasing the basic fare of 7 cents cash, but with the change to five tickets for 35 cents instead of four tickets for 25 cents as now.

Since the operation of the Frankford 'L' during 1921 is the goal toward which we have all long been striving I would suggest that the legal departments of the city and company make every effort to cut the red tape surrounding the awarding of construction contracts by the city, to the end that all possible construction work on Frankford "L" be turned over to P. R. T. for completion, so that its effective organization can be immediately directed to this accomplishment.

Nothing to Conceal

Indianapolis Company Resents Implication that It Tricked City in Fare Appeal

The Indianapolis Street Railway and the Citizens Gas Company are the only Indianapolis public service corporations which have franchise agreements with the city. Both of them have petitions for higher rates pending before the Public Service Commission. Both aver that emergencies exist which require relief, the 1913 public utility law authorizing the commission to act in emergency cases, regardless of franchises. Neither company, however, is affected by the Knapp law, passed by the last Legislature, in which opportunity to surrender franchises is afforded public service corporations.

The Knapp law will go into effect with the general promulgation of the 1921 acts, probably in May. After that time the Indianapolis companies may surrender their franchises and operate entirely under the commission. This fact, however, has thus far had no bearing on the relief petitions pending before the commission on the emergency basis. The emergency set out by the railway company is a cash deficit.

COMPANY ANSWERS THE CITY

A statement issued by Dr. Henry Jameson, chairman of the company board of directors, discussed the attitude of Samuel Ashby, corporation counsel, who has said the city will oppose the company's petition for increase in fares. Dr. Jameson's statement said in part:

In the matter of the petition of the Indianapolis Street Railway to the Public Service Commission, filed on March 14, asking for needed relief in the matter of increased fares, Samuel Ashby, corporation counsel, makes the statement that he "has reports of the financial condition of the company up to a few months ago," thereby leaving the inference that he has been denied any information in recent months in regard to the company's financial situation. This implication is at once unfair to the company and unfair to the city. It has been the attitude of this company at all times cheerfully to furnish any and all information to the city and to the Public Service Commission in order that a broad and constructive policy might be followed for the benefit of not only the city but of the patrons of the company.

Mr. Ashby further states that "the petition was filed without the knowledge of city officials." Mr. Ashby was present and represented the city in December on the petition of the company asking that a charge of 2 cents for transfers be authorized. Mr. Ashby was fully advised of all of these matters and fully represented the city and did not demur to this order.

It is manifestly unfair and erroneous to attempt to create the impression that the company is attempting some action without the city's being fully advised. Personally, I wish to state that this company wishes at all times to keep the city fully advised and to act with it in a spirit that is friendly and constructive and will accomplish the purpose of securing not only better service, but much needed extensions.

Emergency Commission Bill Signed

Governor of New York Approves Measure Providing Relief from Intolerable Conditions in New York City

Governor Miller of New York on March 30 signed the so-called Knight-Adler bill creating a transit commission to take sole charge of New York City's transportation lines and reorganizing the Public Service Commission for the State. The new law became effective at once. There has been much speculation in regard to the selection of appointees to the new commissions, but it is not expected that the Governor will announce the names of the new commissioners for a week or ten days.

THE measure signed by the Governor is the result of the special message of the chief executive of the state to the Legislature on Jan. 24, relating to regulation of public utilities, with special attention to the urgent condition presented by the transit situation in the city of New York. The Governor declared the vital need was the creation of an agency to deal with public utilities with ample and undivided authority and responsibility.

The bill as passed consists of 124 printed pages. Provisions requiring special attention are, however, confined to comparatively few sections. The act amends the Public Service Commission Law, abolishes the Public Service Commissions for the First and Second Districts and the office of the Transit Construction Commissioner and establishes a single Public Service Commission of five members appointed by the Governor at a salary of \$15,000 a year for ten years to have statewide jurisdiction embracing the same class of public utilities as are now under the jurisdiction of existing commissions.

PROVISION FOR EMERGENCY RATES

The act also creates a Transit Commission of three members for a term of five years with an annual salary of \$15,000 to have jurisdiction within cities having a population of more than 1,000,000 (New York City), over railroads, street railroads and stage or omnibus lines lying exclusively or partially within such city, and "to such portions of any railroad as lies within such city and is used for local service and is not operated as part of a trunk line railroad."

In addition to all the regulatory powers possessed by the present commissions, both new commissions are given increased power for regulating rates, fares and charges of corporations coming within their respective jurisdictions—including holding companies. They are given power to determine "just and reasonable rates, fares and charges to be thereafter observed and in force as the maximum to be charged for the service to be performed, notwithstanding that a higher or lower rate, fare or charge has been heretofore prescribed by general or special statute, contract, grant, franchise, condition, consent or other agreement, and fix the same by order."

The new commissions are empowered to order temporary increases or decreases in rates pending the final determination of rate cases before them. All

these provisions for regulating rates and fixing temporary rates apply to gas and electric corporations, steam companies and telephone and telegraph companies as well as transportation companies.

In response to the Governor's suggestion that the foundation be laid for a completely unified system of transportation in the city of New York, Article VI is to be added to the Public Service Commission Law. The subject matter of this article directs the Transit Commission to prepare a plan of readjustment for the relief and improvement of transit with a view to "the combination, rehabilitation, improvement and extension of existing railroads," securing sufficient operating revenue on rapid transit lines to make the city's investment self-sustaining and take it out of the debt limit, and with the further view to "the readjustment of the existing rights and obligations of the railroad companies so that the real values in the railroads may be protected and the securities stabilized." The commission is also directed to "cause a valuation to be made of the physical property used in public service of the railroads it proposes to include" in such plan. Such valuation is to be made the basis for all allowances to the railroad companies under the plan. From the valuation so found there is no provision for appeal.

PUBLIC HEARING BEFORE ADOPTION

Procedure for the adoption of the new plan for relief for the companies in Greater New York as outlined in Section 107 of the bill calls for a public hearing before adoption. After adoption the plan must be submitted to the public authorities (Board of Estimate) for approval. This procedure would appear to be merely a matter of form, for if in the judgment of the commission there is justification for carrying out the plan, the commission is directed to proceed with the preparation of contracts, plans and specifications and such other action as may be necessary to carry it out, and "may in the name and in behalf of the city execute and deliver such contract or contracts with full legal force and effect as if all approval of the local authorities had been given," any law to the contrary notwithstanding. The right to accept or reject the program laid down by the commission is, however, made optional with the companies involved. It is to the provision of this section particularly that exception is taken by the city of New

York, on the strength of its acknowledged investment of more than \$300,000,000 in the present rapid transit lines.

The section empowering the commission to prepare a plan for the readjustment provides that the plan advanced by the commission shall contain provisions which in the judgment of the commission will accomplish as nearly as may be the following four main purposes:

1. The combination, rehabilitation improvement and extension of existing railroads so that service thereon may be increased and improved to the fullest extent possible.

2. The receipt by the city of sufficient returns from the operation of the railroads so that the corporate stock or bonds issued by the city for the construction of rapid transit railroads may be exempted in computing the debt incurring power of the city under the constitution of the state.

3. The readjustment of the existing rights and obligations of the railroad companies so that the real values in the railroads may be protected and securities stabilized.

4. The assuring to the people of the city the continued operation of the railroads at the present or lowest possible fares consistent with the just valuations of the railroads and their safe and economical operation.

Little Hope for Texas Utility Act

Municipal home rule representatives in the House of the Texas Legislature by incorporating in the proposed utility act many amendments injurious to utilities have forced proponents of the bill to kill it by striking out the enacting clause. This development leaves little hope for state utility relief until the next biennial session of the Legislature.

The bill was drafted by a committee appointed by the Governor and consisting of an equal number of representatives of municipalities, utilities, state commercial bodies, House of Representatives and Senate. The original draft of the bill as prepared by the representatives of the municipalities was very drastic on utilities. Many open hearings were held by the committee, however, and a greatly amended final draft was passed by a large majority of the committee, only the municipal representatives reporting adversely.

The measure then was introduced into the House and Senate and after being favorably reported in both Houses was passed by the Senate. It was held up in the House by municipal home rule representatives and so loaded with clauses inimical to the interests of public utilities that it became necessary to kill it.

Northwest Developing Vast Water Power Plans

With the Chicago, Milwaukee & St. Paul Railroad electrified over most of its Rocky Mountain-Pacific section, the Great Northern intimating it has additional electrification plans in mind and intense interest shown by other railroads in the prospective development of a large hydro-electric plant at Wallowa Rapids on the Columbia River, it would appear as if the days of coal in the Pacific Northwest were numbered

as a main factor in major transportation. The Great Northern plans extensive development of its Chelan River plant, while the Washington Water Power Company, now supplying current to the Chicago, Milwaukee & St. Paul road, is developing an additional 15,000 hp. at Spokane and investigating the possibilities of power development at Kettle Falls, north of Spokane. The outlet for this additional power is undoubtedly the railroads, although no definite statement has been made.

In the passage at arms between Seattle and Portland recent rate adjustments from Inland Empire points to Portland the statement was made at Seattle that the rate was not justified as the Chicago, Milwaukee & St. Paul Railroad was now hauling freight to Seattle over the Cascade Mountains at a lower per ton cost than the Spokane, Portland & Seattle road could deliver commodities at Portland with water grade down the Columbia River for the entire distance. This would appear to be a most interesting commentary on the advantages of electricity as applied to major railroad operations.

Campaign Renewed for Jitneys on Broadway

The Broadway Association, New York has again raised the question as to whether the present electric railway on Broadway shall be replaced with lines of buses. This activity is similar to a move made by the association about a year ago. The questions submitted then, however, were confined to a referendum among the members of the association itself. The referendum vote is asked on these questions:

Are you in favor of a through line operated from Bowling Green to Kingsbridge for a single fare without transfer?

Are you in favor of the continued use of the present type of green car on Broadway south of Forty-fourth Street?

Are you in favor of the removal of the street car tracks and the substitution of a modern bus system operating on Broadway?

The circular of the association says:

Reliable information is that a bus line can be profitably operated on the entire length of Broadway in Manhattan for a single fare.

City Refuses to Stop One-Man Cars

Union labor organizations in the city of Sacramento, Cal., recently tried to get the City Commission there to refuse to allow the Pacific Gas & Electric Company to operate one-man cars in that city. They opposed the one-man car on the ground of safety. The company succeeded in proving that the one-man cars were not unsafe. The opposition then switched to the claim that the commission should rule the cars out on the ground of civic pride. Finally, the labor organizations came out in the open and admitted that their opposition to the cars was based on the belief of their being inimical to the best interest of labor. The measure was defeated thereupon by a vote of four to one. The State Legislature is now considering similar union labor measures to prohibit the use of one-man cars anywhere in the State.

Hot Campaign Closing in Detroit

Private Company and City Engaged in Frantic Effort to Win the Public Vote on April 4

With the approach of the election at Detroit, Mich., on April 4, when two questions pertaining to railway matters are to be placed on the ballot, the Detroit United Railway is urging the adoption of its service-at-cost ordinance as a means to settle the railway controversy in Detroit, while the Street Railway Commission is urging the people to approve the purchase by the city of about 25 miles of Detroit United Railway lines.

THE D. U. R. has been conducting a campaign to educate the voters as to the provisions of the company's ordinance, using newspaper advertising and street car posters, fostering public discussions and sending copies of the proposed ordinance to each registered voter in the city. *Electric Railway Service*, the company's weekly publication, has also devoted considerable space each week to analyzing the company's proposed ordinance.

FOUR MAIN POINTS CONSIDERED

F. W. Brooks, president of the Detroit United Railway, is quoting Delos F. Wilcox's pamphlet "Flexible Fares" against Mr. Wilcox. Mr. Brooks states that the Detroit plan has been patterned after the Cleveland plan with such additions and improvements as in the years of Cleveland experience, have been found necessary to improve the measure. He further maintains that every minor fault that Mr. Wilcox has ever expressed in print with the Cleveland plan has been corrected in the Detroit service-at-cost plan, and that in Detroit as in Cleveland, service-at-cost means peace and order instead of strife and chaos.

On the other hand the city officials have sent out to the voters a pamphlet containing an official report to Mayor Couzens by Delos F. Wilcox, analyzing what is termed "The D. U. R. Square Deal Service-at-Cost Franchise." It is stated in the pamphlet over the signature of Mayor Couzens that the services of Mr. Wilcox were secured that the citizens might get the best possible analysis of the Detroit United Railway plan by a neutral authority.

CHIEF OBJECTIONS OUTLINED

A summary of what appears to Mr. Wilcox to be the chief defects of the ordinance from the public point of view enumerates: granting a thirty-year blanket franchise; highest valuation for the company property; no-limit fare; appeal to the courts wiped out; premium on inefficiency; Detroit United Railway wrote its own contract; possibility of abrogation of the terms of the contract through legislation or action of the State Utilities Commission without the city's consent.

The city's pamphlet also summarizes briefly a number of undesirable features of the service-at-cost ordinance pointed out by the Corporation Counsel, and after reviewing briefly the progress made by the Street Railway Commission since April 5 last, when the \$15,000,000 bond issue was approved by the people, explains the provisions of the city's

purchase plan. The purchase plan is stated to be a progressive step in carrying out the municipal ownership plan approved by a 63 per cent vote of the people last April. The lines in question will be purchased with money derived from the original bond issue and additional funds are not required.

Several suits involving the city and the Detroit United Railway are still pending, among which is the action brought by the Detroit United Railway against certain city officials involved, for contempt of court in not obeying the temporary restraining order against the city crossing the Mack Avenue line with the tracks of the St. Jean line of the Municipal Railway. John A. Mercier, the contractor who constructed the first stretch of municipal roadbed last year, has brought suit against the Street Railway Commission to prevent the city from going ahead with construction work with its own forces on a stretch of line where Mr. Mercier holds the contract to do the excavating and to lay the concrete bed. A different type of construction is now being used by the Street Railway Commission and the contractor refused to change his contract to conform with the new specifications. Considerable money can be saved by changing to the new type of construction, Joseph S. Goodwin, manager of the municipal lines, believes.

Taxpayers' Suit Heard

Arguments on the motion of the fourteen taxpayers to dismiss the Stone & Webster suit to enjoin them from making the Puget Sound Power & Light Company a party to their suit against the city of Seattle, in the matter of disposition of funds of the Seattle Municipal Railway, were completed recently in Judge Jeremiah Neterer's Court, along with arguments on the company's plea for an injunction against the taxpayers. Judge Neterer reserved decision in the action of the company against the taxpayers.

Attorneys for the traction interests sought to show that the taxpayers contemplated an attack on the special fund created in the contract for payment of bond interest and principal. He asked whether the court would shut the door on the company and make it take its chances on what would happen on Sept. 1, when the next interest payment is due, and on March 1, when \$833,000 of the principal is due as well. Attorneys for the taxpayers denied that any breach of contract was sought, but that the action was simply taken to protect the city's general fund.

43 per Cent Wage Reduction

Company at Davenport Unable Longer to Stand High Wages, Jitney Competition and Political Opposition

Unable longer to bear the brunt of unregulated jitney operation, high wages and continued political opposition from a Socialist City Council, the Tri-City Railway, Davenport, Iowa, on March 25, notified employees on the Iowa lines that a 43 per cent reduction in wages would go into effect on April 1. The new scale for trainmen will be: Men under six months, 36 cents an hour; men over six months and less than one year, 38 cents an hour; men one year or over in company employ, 40 cents an hour; shop and carhouse men, 40 cents maximum.

THE present scale carries a 70-cent maximum and has been in force since June 1 last. It was negotiated under the condition that the company receive sufficient fare to pay the increase in wage. It was agreed on following arbitration.

Since that time the City Council in Davenport has refused to allow the company to install one-man cars, has threatened an increase in taxation and has repeatedly refused to increase fares, the traction lines finally being forced to go into court and secure by injunction a 9-cent fare, with three tickets for a quarter. This fare has, however, been greatly discounted by unregulated taxi and jitney competition.

The railway recently went into court and secured an injunction against forty-six of the jitney buses which were violating the city ordinances and which the Socialist City Attorney refused to stop.

UNION CHIEF DISCHARGED

The president of the local union of railway employees made a speech at the City Council attacking one-man cars, a speech which is regarded as largely instrumental in the defeat of this plan of operation. The union head also criticised company discipline and was discharged as a result of a statement the company declares was untrue.

Members of the City Council asked the head of the union to apologize to President B. J. Denman of the traction lines, but he refused to do this and a strike vote followed by the Davenport, Rock Island and Moline trainmen. No date was set for a strike but negotiations have so far proved fruitless. In the face of this situation the company has announced the reduction in wages.

The men, in the effort to secure the reinstatement of their deposed chief, have invoked state arbitration through Governor N. E. Kendall of Iowa under a law of 1913. This law makes investigation of the case at issue by an arbitration board compulsory on the petition of more than twenty-five disinterested parties. The Governor has notified the company and the trainmen to select five names each, from which he will appoint two arbiters, these two to select a third.

The finding of the board, however, is not compulsory unless both sides to the controversy agree to accept its decision and the Tri-City Railway has signified unofficially that it will not accept this decision as it does not consider the discharge of a man on the ground of disloyalty as a subject to be arbitrated.

The company, however, has evinced a disposition to arbitrate the new 40-cent wage scale, but not on the basis of the present 70-cent scale. The company will likewise refuse to agree to accept the finding of an arbitration board on a wage scale if it considers the finding of the board in terms of wages beyond its financial ability to pay.

Massachusetts Strike Threat

Amalgamated Regards Retrenchment Program of Eastern Massachusetts as Attempt to Crush Union

Reply has been made by the Amalgamated Association at Boston, Mass., through Counsel Vahey to the notification issued on Feb. 25 by the trustees of the Eastern Massachusetts Street Railway that at the expiration of the existing wage and working agreement on May 1, a reduction of 20 per cent in wages would go into effect. The trustees further stated that they desired and intended to cancel the entire agreement at that time, and that their letter should be construed as an official notification of that intention in accordance with the terms of the agreement as to

As a matter of fact the trustees have not made any statement relative to what position they will take should arbitration be suggested or demanded. Their attitude is that the public is demanding lower fares and the biggest obstacle to any fare reduction is the present wage scale.

Letters have been sent by the trustees to the local "Home Rule Committees" of citizens in the various cities and towns served by the company, inviting them to meet the trustees to discuss the expected reductions in wages and to express their opinion and discuss as to the best means of passing along the reduction to the public. It is the announced intention of the trustees to return to the public every dollar saved by wage reductions, either by equivalent reductions in fares, improved service or both. In all their published statements the trustees are standing squarely on the issue that lower fares for car-riders hinge on lower rates of wages.

The accompanying comparison of hourly wages of the various classes of employees in 1915 and 1920 has been issued by the trustees.

The trustees have received a petition for the restoration of service in Gloucester, Mass. Service there was suspended nearly a year ago as the lines did not earn expenses and the city authorities failed to agree to make up the deficit by taxation. This latest petition is of especial interest as it was signed by some of the former employees who have been out of work since the cars ceased to run. These men have now expressed their willingness to work at the reduced rate of wages which the trustees have announced to go into effect on May 2, on the entire system.

COMPARISON OF WAGES OF EASTERN MASSACHUSETTS STREET RAILWAY EMPLOYEES

	Cents per Hour			Per Cent
	1915	1920	Increase	
Conductors and motormen.....	26.83	62.00	35.17	131.1
Car cleaners.....	21.89	*66.74	39.91	148.7
Watchmen.....	18.38	58.00	39.62	164.9
Armature winders.....	28.24	63.00	34.76	123.1
Pitmen.....	24.80	61.00	36.20	156.5
Machinists.....	27.62	63.00	35.38	128.1
Carpenters.....	28.88	62.00	33.12	114.7
General helpers.....	20.72	58.00	37.28	179.9
Trackmen.....	22.2	58.00	35.8	138.8
Firemen.....	27.76	66.00	38.24	137.7
Oilers.....	25.93	62.00	36.07	139.1
Assistant engineers.....	33.76	76.00	42.24	125.1

*Operators of one-man cars.

changes, amendments or continuation.

Formal action on the matter was not taken before on account of the absence of Mr. Vahey from Boston. After reviewing the situation Mr. Vahey issued a lengthy statement to the papers denying the right of the trustees to cancel the agreement in its entirety and charging an attempt to disrupt and break up the union. Mr. Vahey takes the stand that the trustees are distinctly antagonistic and unfair to organized labor and that they have taken an arbitrary and unwarranted stand in the present instance, in refusing to arbitrate the matter. He intimates such action may cause the men to strike.

Officials of the union have denied that the Gloucester men would work at the proposed wage scale, but the trustees have the petition bearing the signatures of a number of the men.

Jersey Jitneys Jolted

Following a prolonged debate the Senate of New Jersey by a vote of twelve to three has passed the measure regulating jitneys and placing their operation in certain particulars under the jurisdiction of the Public Utility Commission. The bill, effective from March 15, does not affect jitneys in operation prior to that date.

News Notes

City Road Made All-American.—Twenty-five employees on the Seattle (Wash.) Municipal Railway who have not become American citizens will be removed from the payroll and supplanted by citizens.

Wage Settlement Expected.—No decision had been reached up to March 29 on the wage contracts submitted by the carmen's union to the Community Traction Company, the successor to the railway property of the Toledo Railways & Light Company, Toledo, Ohio.

Texas Line Reduces Wages.—The Wichita Falls (Tex.) Traction Company has announced a reduction of 11 per cent in wages of conductors and motormen, the cut to be effective from March 15. Decreased revenue is assigned as the cause. The trainmen have accepted the wage cut.

Bill Against Expenditures for Publicity.—A bill was introduced in the Assembly of New York on March 8 by Mr. Antin adding new section 230a to the Public Service Commissions Law, providing that no expenditure for publicity purposes by any corporation subject to jurisdiction of Public Service or Transit Commission shall be allowed as an element in fixing fares or charges.

City Sues to Recover for Paving.—The city of Danbury, Conn., has filed a suit to recover \$18,000 damages from the Danbury & Bethel Traction Company due to the fact that the city was forced to pay for the paving of the tracks of the railway last year because the company did not have enough funds to carry out the work. Corporation Counsel Samuel A. Davis has filed complaint in the Superior Court at Bridgeport in the interest of the city.

Mayors Opposed to Traction Measure.—A measure has recently been introduced in the Legislature by Assemblyman George D. Brady, Buffalo, which would vest in the Public Service Commission power to regulate the amount of pavement costs to be paid by traction companies regardless of agreements between companies and municipalities in which they operate. The State Conference of Mayors cited thirty-one reasons in opposition to the bill.

Brooklyn Lines Assessed Too High.—The Brooklyn City Railroad, the Prospect Park & Coney Island Railroad, the North Beach Railroad and several other Brooklyn surface and elevated lines were granted recently by Justice Manning in the Supreme Court a writ of certiorari requiring the State Tax Commission to show cause in Albany on

May 9 why the franchise assessment of the lines should not be reduced. The total amount of the assessment is \$39,077,930, which the lines contend is \$13,704,132 too much.

Chamber of Commerce Plans Railway Survey.—A plan for a special committee of five men to make a survey of the operating and financial conditions of the Pittsburgh (Pa.) Railways, with a view to assisting the company to better local conditions, was adopted by the Chamber of Commerce of Pittsburgh on March 16. The resolution asking for the appointment of the committee was sponsored by the chamber's regular committee on municipal affairs and approved by the board of directors.

Bills Still Being Introduced.—Considerable legislation continues to be introduced in the Indiana General Assembly affecting interurban lines. A bill passed the House recently by unanimous vote empowering the Public Service Commission to prescribe headlight regulations for interurban cars. A strong attempt was made on the part of enemies of public utilities to pass the Harris House bill, which would compel electric railways whose lines cross those of steam roads to pay for the upkeep of the crossing on a wheelage basis. The bill has been indefinitely postponed. This kills it so far as the present session is concerned.

Railway Employees to Hold Reunion. A reunion of all employees of the Massachusetts Northeastern Street Railway, Haverhill, Mass., will take place at Canobie Lake Park, Salem, N. H., on May 20, for the benefit of the mutual relief fund of the company. This Mutual Relief Association is an incorporation formed for the purpose of furnishing death benefits and relief to ill and disabled employee members of the association. During the past season the association paid out more than \$1,700 in sick and death benefits and all efforts will be made to raise this amount in the spring meeting.

Electrical Workers Return.—After a strike of sixteen days, the electrical workers, including linemen and substation operators of the British Columbia Electric Railway at Vancouver and Victoria have returned to work. The dispute was over wages. The company rejected the award of a conciliation board on the ground that its decision was based on conditions last August and offered a 10 per cent reduction. The deadlock was broken by the company granting the men their requests and signing up an agreement on the basis of the award. During the strike, the light, power and railway service was maintained by the substations being operated by office employees of the company.

Indictments Dismissed.—Supreme Court Justice Edward Lazansky has dismissed the indictment against officials of the Brooklyn (N. Y.) Rapid Transit Company, which were secured following the Malbone Street tunnel wreck in 1918. In the accident more

than ninety people were killed and several hundred were injured. The officials of the road from the motorman to the general manager were indicted but no convictions were secured. District Attorney H. E. Lewis, on whose motion the indictments were dismissed, stated to the court that in view of the circumstances as to the evidence and the great expense attached to the trials he did not feel justified in again bringing the men to court.

Active Year for Safety League.—The Ontario Safety League, Toronto, Canada, recently published a statement reviewing its activities and accomplishments for the year 1920. In an effort to prevent accidents the league has carried on an intensive and extensive campaign throughout the province of Ontario. By the distribution of bulletins, circulars, leaflets, etc., and by means of conferences, posters, motion pictures and lantern slides, the appeal has reached practically every city and town in Ontario. The most notable activity of the year was a three-day safety convention in April last, at which important papers were read and discussed by representatives of industry from Ontario, Quebec, Nova Scotia and Manitoba. This convention together with a "Safety Week" drive in October had far-reaching effects.

Des Moines Railway Starts Advertising Campaign.—Homer A. Miller and F. C. Chambers, receivers for the Des Moines (Ia.) City Railway, have started an advertising campaign to acquaint the car riders of that city with the comparison between the general good done in Des Moines by the company and its competitor, the motor bus. Every day during the week ended March 26 an advertisement appeared in all of the city dailies, each message being devoted to some particular side of the question in the war between the railway and the buses. In addition to the newspaper advertising letters have been mailed to a large number of business men of the city to give them a better understanding of the actual situation.

Perpetual Franchise Upheld.—An opinion was handed down by Judge A. M. J. Cochran in the United States District Court at Covington, Ky., during the week ended March 26, in which he held that the South Covington & Cincinnati Street Railway has a perpetual franchise on certain streets in Fort Thomas, Ky., and that an ordinance is void that was passed by the Board of Trustees of Fort Thomas on Feb. 16, 1917, by which it was sought to compel the company to pay rentals on Mt. Pleasant, Dundee and Highland Avenues. The suit was filed by the railway against the town of Fort Thomas three years ago, seeking an injunction to prevent the collection of rentals on the thoroughfares mentioned. Judge Cochran held the certain grants made by the Highland Park Land Company were legal and that the company had installed tracks on some of the streets before they were used as thoroughfares in the town of Fort Thomas.

Financial and Corporate

P. S. Net Falls

Passenger Revenue and Traffic Increase of 15 per Cent Fails to Offset Increased Costs

According to the twelfth annual report of the Public Service Railway, Newark, N. J., for the year ended Dec. 31, 1920, the company did not earn sufficient to meet operating expenses and fixed charges excluding any amount for amortization and depreciation.

In speaking of rates the report said that the efforts to secure a rate adequate to requirements have, broadly speaking, been practically continuous since early in March, 1918, when the first application was filed with the Public Utility Commission.

Utility Commission in its determination of a reasonable rate for that company.

Subsequent to the passing of this act the Public Utility Commission took no further action in the matter of fixing the value of the railway's property. Pursuant to the act, Ford, Bacon & Davis, New York, were selected to make the valuation. Work was undertaken about Aug. 1 and the valuation is expected to be completed very soon.

On Dec. 7, 1920, the railway filed with the Public Utility Commission a schedule of rates calling for a 10-cent fare with free transfer, to be effective Jan. 1, 1921. This rate was suspended by the utility commission pending hearings, but the removal of the commissioners made hearings impossible. With

state to the several ferries reaching New York City was handled by the railway in a way that merited general commendation.

The labor situation during the greater part of the year was a difficult one, not only on account of shortage by reason of the higher rates paid by other industries, so that on May 1 the company advanced the pay of trainmen 5 cents per hour and made corresponding increases in other departments.

To provide improved service, particularly on lines of light traffic, by giving a shorter headway with more economically operated equipment, 200 safety cars which can be operated by one man were adopted. On Sept. 5, 1920, the first regular service with this type of car was started on the Riverside line in Paterson. By the close of the year seventeen lines in Passaic, central division, had been equipped with these cars, the service of which is satisfactory and fully up to expectations. In order to accommodate the dense traffic on heavy city lines, where the small safety car is unsuitable, the trailer type of car was adopted. At the close of the year only one of the 100 ordered had been received. This has been tried on a number of different lines and operates in a very satisfactory manner.

In order to provide better facilities for coping with snow troubles, fifteen double truck snow plows and sixteen single truck snow sweepers were also contracted for during the year.

During the year 18.97 miles of track was reconstructed of new rail and 4.102 miles with same rail. Track extensions built during the year totaled 1.468 miles. The total trackage of the system now is 897.721 miles.

The ferries operated by the company from Edgewater and Bergen Point showed substantial increase in business during the year. During labor troubles in New York Harbor, however, the ferry employees of this company remained loyal and service was not interrupted from that cause.

The cost of claims against the railway including expenses of administration during the year was \$1,276,846.46, or 4.9 per cent of the gross receipts. Notwithstanding the increased number of vehicular accidents due to the large use of motor vehicles, the figures compare favorably with the previous year in which the cost amounted to 5.3 per cent of the gross receipts.

Statistics as to operation are presented in the accompanying tables.

La Fayette Company Organizes

The La Fayette Service Company, La Fayette, Ind., which some time ago took over the La Fayette section of the Fort Wayne & Northern Indiana Traction Company, has announced its permanent organization as follows: President, Walter L. Haehnlen, Philadelphia, Pa.; vice-president, Clyde W. Reed, Fort Wayne, Ind.; secretary-treasurer and general manager, R. W. Levering, La Fayette, Ind.

INCOME STATISTICS—PUBLIC SERVICE RAILWAY

	1920	1919	Per Cent Change
Passenger revenue.....	\$26,200,000	\$22,600,000	+15.9
Operating revenue.....	27,881,990	24,146,251	+15.5
Non-operating income.....	108,706	71,774	+51.4
Gross revenue.....	27,990,696	24,212,025	+15.0
Operating expenses and taxes.....	\$23,548,878	\$19,624,065	+20.0

TRAFFIC STATISTICS—PUBLIC SERVICE RAILWAY

	1920	1919	Per Cent Change
Miles of line.....	538,173	539,031	-0.16
Miles of revenue track.....	851,390	852,310	-0.11
Total revenue per mile of line.....	\$52,000	\$43,100	+20.5
Total revenue per mile of revenue track.....	\$32,900	\$27,250	+20.7
Revenue passengers.....	363,757,587	(a) 327,619,606	+11.0
Transfers and passes.....	89,777,107	69,069,628	+30.0
Total passengers.....	453,534,694	396,689,234	+14.3
Percentage of passengers using transfers.....	17.7	15.4	(b) +2.3
Average fare per passenger (cents).....	5.79	5.71	+1.4
Car-mileage.....	60,798,743	57,644,927	+5.5
Car-hours.....	6,539,207	6,039,453	+8.2
Passengers carried per day.....	1,239,166	1,086,820	+14.1
Passenger receipts per car-mile (cents).....	43.21	39.29	+10.0
Per car-hour.....	\$4.02	\$3.75	+7.2
Ratio car-miles to car-hours.....	9.30	9.54	(b) -0.24
Estimated population served.....	2,423,225	2,125,356	+14.0
Rides per capita.....	187	186.5	+0.27

(a) Mile zone system in effect Sept. 14 to Dec. 7, 1919.

(b) Difference.

The 1919 report expressed the hope that there remained but the presentation of certain testimony collected by the commission as to real estate values, summing up by counsel, and decisions by the commission to fix the value of the company's property. The last formal hearing in the case was held on Feb. 26, 1920, and a reasonably prompt decision was generally expected, but certain circumstances intervened to prevent.

The Legislature of New Jersey, the report goes on to say, in response to a well-defined public demand for an independent valuation of street railway property, passed an act which became effective May 5, 1920, creating a special commission of state officials authorized to appoint a firm of engineers to appraise the properties of any or all of the street railway companies in the state. The act provides that the valuation of a property so determined is to be accepted as evidence by the Public

the appointment of a new commission and the completion of the valuation of the company's property an early determination is expected.

Notwithstanding former trying experiences, the year 1920 was one of the most difficult. During more than three months weather conditions made operation not only difficult but expensive. By the use of all its facilities and almost superhuman efforts on the part of the operating force during the severe storms, the lines were kept in operation, reflecting great credit on the personnel and a most favorable comparison between this and other systems operating in large communities where many sections were not operated for a considerable period after such storms. Again, during the outlaw strike of steam railroad labor in the spring of 1920 commutation train service on practically all railroads was suspended and the burden of transporting commuters from the northern part of the

Franchise Abrogation Bill Seems to Be Doomed

Abrogation of the perpetual franchises enjoyed by the Columbus Railway, Power & Light Company, on certain streets of Columbus, Ohio, proposed in the bill introduced by Senator J. F. Atwood of Columbus, seems very unlikely as the result of the action of the Ohio Senate last week in sending the bill back to another committee.

The measure has been reported out by the committee on cities with recommendation for passage, but when it came up on the calendar for passage a determined attack upon it by Cleveland and Cincinnati Senators resulted in its being referred to the public utilities committee, which is said to be anything but friendly to the measure. In view of the vote in favor of recommitment the possibility of the bill coming out now seems very doubtful.

Opposition on the part of the Cincinnati and Cleveland solons is due to the fact that many citizens and institutions in those cities own stock and hold bonds of the Columbus Railway, Power & Light Company, which would be still further depreciated if the future of the company and its credit are made insecure by repeal of the perpetual franchises.

Senator Atwood introduced the bill at the request of a group of Columbus citizens interested in making it possible for the city to obtain terms from the company when the present blanket franchise expires in 1926. Only by legislative action can the perpetual franchises held on streets other than those covered by the blanket franchise be terminated, and it is charged that undisturbed retention of the franchises gives the company a hold in Columbus detrimental to the interests of the citizens.

Charles L. Kurtz, president of the Columbus Company, told the Senate committee on cities, by which the bill was reported for passage, that enactment of the Atwood bill would handicap the company in its effort to refinance itself; that investors will cease to buy securities if informed that all franchises are to end in a few years, and that the company would face uncertainty in getting a new grant in 1926.

Indiana Company Sells Stock Direct to Public

Some time ago Harry Reid, president of the Interstate Public Service Company, Indianapolis, Ind., decided to offer an issue of the 7 per cent prior lien stock to patrons of the interurban gas and light properties operated by the company. In commenting on the success of the offering Mr. Reid said:

In spite of the fact that the money market has been described as tight, and stocks and bonds generally have not been absorbed as rapidly as in normal times we have sold approximately \$500,000 of our 7 per cent prior lien stock. The people of this State have money to invest and will put it in sound, profitable investments.

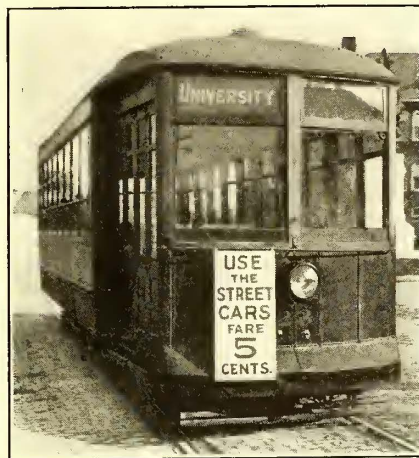
Our company naturally is pleased to find that its customers have enough faith in it to place some of their savings on surplus funds with us. It makes them partners in the enterprise. It seems to me that

this partnership relation will be beneficial both to the company and to its patrons. The public utility business is really the people's business, anyhow, and the closer the relationship between the companies and the people the better it will be for both.

The Interstate Company handled this issue through its own employees, selling the stock at par at its branch offices.

1920 a Profitable Year in Charlottesville

The Charlottesville & Albemarle Railway, operating in Charlottesville, Va., was one of the few public utility companies operating railways as a part of their system that paid both preferred and common stock dividends in 1920. This is favorable indeed in view of the fact that the company is still operating on a 5-cent fare on its 3.5 mile line. With the hope of costs decreasing it was decided to continue at the old rate, and make every effort to increase patronage. The accompanying illustration shows the company's appeal for new patrons. The railway's report for the



BIDDING FOR TRAFFIC IN CHARLOTTESVILLE

year just ended is also good in view of the fact that lighting and power rates have only been increased to cover the rise in the cost of coal. During the year \$30,925 was spent for permanent improvements, the largest expense being for two combustion Engineering Corporation's heavy duty type "E" automatic stokers. The income statement for the past two years follows:

Item	1920	1919	Per Cent Change
Operating Revenues:			
Railway.....	\$60,226	\$50,957	18.2
Light and power.....	138,003	102,054	35.2
Total.....	\$198,229	\$153,011	29.5
Operating Expenses:			
Railway.....	\$42,755	\$35,977	18.8
Light and power.....	67,999	43,183	57.6
Depreciation.....	20,000	.....	.....
Total.....	\$130,754	\$79,160	65.3
Net revenue from operation.....	\$67,475	\$73,851	-8.6
Non-operating income..	634	761	-16.7
Gross income.....	\$68,109	\$74,612	-8.7
Fixed charges.....	35,499	33,115	7.2
Net corporate income	\$32,610	\$41,497	-21.4
Dividends on pf. stk..	8,589	8,589	.....
Dividends on cm. stk.	15,000	25,000	-40.0
Surplus.....	\$9,021	\$79,08	14.1

Net Income of \$103,736 in East St. Louis

A 4 per cent dividend, totaling \$77,600, has been declared by the East St. Louis (Ill.) Railway on the company's capital stock of \$1,940,000, according to an announcement by W. H. Sawyer, president of the company. This is the largest dividend the company has voted in several years. The road is controlled by the East St. Louis & Suburban Railway.

A financial statement presented at the annual meeting and made public by Mr. Sawyer shows that the net income of the East St. Louis Railway during 1920 was \$103,736. The balance remaining after the payment of the 4 per cent dividend will be added to the credit balance of the company, making the total \$235,514. The statement follows:

Operating revenues	\$1,182,704
Operating expenses, depreciation, etc.	941,051
	<hr/>
	\$241,653
Taxes	45,000
	<hr/>
Operating income	\$196,653
Deductions:	
Interest on bonds..	\$98,470.00
Miscellaneous interest, discounts, etc.	3,422.28
	<hr/>
	101,892
	<hr/>
Non-operating income	\$94,760
	8,975
	<hr/>
Net income	\$103,736

According to Mr. Sawyer the operating income of the company was approximately the figure that the Illinois Public Utilities Commission had fixed, the losses for the first few months of the year before the 8-cent fare became effective having been made up in the closing months. The commission had placed \$195,000 as a fair income for the East St. Louis Railway after paying operating expenses, depreciation, power and other rentals.

This is the first time that a statement of this kind has been made public. Mr. Sawyer said that he expected the revenues of the company in 1921 would be in the neighborhood of last year's total, pointing out that the recent cut the Public Utilities Commission has ordered in fare would probably result in showing an increase the first part of the year over the corresponding period of 1920, but that the closing months would see a reduction as compared with the previous year.

New Interurban Contracts Being Negotiated

Wilfred Cann, street railway commissioner, and Frank R. Coates, president of the Community Traction Company, Toledo, Ohio, conferred with twenty representatives of interurbans entering the city in a preliminary meeting on Feb. 12 in the matter of new contracts for use of city tracks at Toledo.

The Milner ordinance provides that the interurbans could use the streets on the terms of old contracts only until

new ones could be negotiated. The contracts are subject to arbitration.

The Toledo & Western Railroad, through its receivers, has asked the Public Utilities Commission to allow it to take Toledo off its tariff and substitute West Toledo for it, so that fare changes within the city limits could be adjusted to local conditions without the filing of a new petition and tariff every time the fare changed in the city limits. The company seeks in the petition to make its city fare agree with the 6-cent rate of the Community Traction Company, by March 14.

It is thought that this will be the course of action of practically all of the interurban lines entering the city. They will be regulated by tariff only to the city limits and then by contract adopt the city fares to agree with those set in the Milner ordinance.

The Toledo, Ottawa Beach & Northern Railway, one of the remaining Doherty lines at Toledo, has also filed a tariff making its city fare agree with the Community lines and increasing its fare to Toledo Beach, Mich., by 5 cents.

Financial News Notes

Back Coupons and Interest Paid.—Jan. 1, 1921, coupons on the New Orleans Railway & Light Company, general mortgage 4½ per cent bonds will be paid on and after March 31, 1921, upon presentation at the office of the New York Trust Company, N. Y., or the Hibernia Bank & Trust Company, New Orleans, La. In addition to the face amount of the coupons 28 cents interest thereon will be paid.

Sales of Roads Under Foreclosure Directed.—Judge Cummings at Sunbury, Pa., on March 18 directed the sale of the Sunbury & Selinsgrove Electric Railroad, the Sunbury, Milton & Lewisburg Railroad and the Chillisquaque Connecting Railroad, which have been in receivers' hands for more than seven years. The order of sale of the three properties was made to satisfy mortgage bond claims of more than \$600,000, upon which interest is in default.

Valuation Protested.—A hearing to determine the validity of the valuation of the property of the Fargo-Moorhead Street Railway, Fargo, N. D., as ascertained by the State Railroad Commission, will be held on April 18. Notice of the hearing was filed with the City Commission on March 16 by the State Railroad Commission. According to this notice the railway recently protested against the valuation of its property as fixed by the commission.

Fewer Passengers in Toledo.—According to Street Railway Commissioner Cann there were 5,000 fewer daily electric railway passengers in To-

ledo, Ohio, in the month of March. He believes the decrease is due to the industrial depression which is now beginning to have its effect in the supply of ready money citizens have on hand. The Community Traction Company will report a deficit for March, it is estimated, of more than \$75,000 as compared with a deficit of \$58,000 for the previous month.

Appeal of City for Co-receiver Denied.—Declaring that if he later considers it advisable to appoint a co-receiver to represent the city's interest he will do so, Judge H. H. Watkins, at Anderson, S. C., on March 19 announced that he will leave the affairs of the South Carolina Light, Power & Railway Company, Spartanburg, S. C., temporarily at least, in the hands of George B. Tripp, vice-president and general manager of the company, and J. B. Lee, a director of the corporation, who were appointed receivers on Feb. 17.

Cable Cars Put on a Car-Mile Basis.—The United Railroads, San Francisco, Cal., has about 14 miles of cable railroad which will probably never be electrified because the grades range up to 19.8 per cent. In figuring up the earnings on this cable system, it is interesting to note that the cable cars show average earnings per car mile of 47 cents compared with 36 cents for the electric lines, but on the basis of car-hour earnings, the cable lines average \$3.26 whereas the electric lines average \$3.35. The explanation lies in the fact that the cable lines operate over comparatively short routes at slow speeds, averaging only about 6½ m.p.h.

Berkshire Company Faces Receivership.—Receivership for the Berkshire Street Railway, Pittsfield, Mass., is inevitable unless legislative relief is granted immediately, L. S. Storrs, vice-president of the company, told the legislative committee on street railways sitting in Pittsfield. The road operates 75 miles of tracks in Berkshire County. The New York, New Haven & Hartford Railroad, which owns stock, has put \$6,000,000 in the property. According to the figures presented by Mr. Storrs the company's deficit last year was \$100,000 and it now owes \$94,000 for taxes, \$40,000 for fuel and other essentials and has only \$15,000 on hand. The parent company is willing to sell the property at a state appraised valuation and have it run by trustees like the Boston Elevated Railway.

Only \$42,265 Earned to Meet Charges.—The Dallas (Tex.) Railway reports a gross income of \$262,675 for the month of February, 1921, while the operating revenue for the same period was \$220,410, not including interest on bonds, stocks, notes, commissions or discounts on loans or costs of raising money, rental on the Oak Cliff lines owned by the Northern Texas Traction Company, or dividends on stocks, which leaves a balance earned for return on the investment of \$42,265. These figures are given in the financial statement submitted to the supervisor of public utilities covering the month of February and the forty-one months under which

the company has been operating under the present franchise. The earnings of the company are set forth in detail in a statement which has been published in all the newspapers of Dallas as a display advertisement.

Property of United Railroads Sold.—The United Railroads, San Francisco, Cal., was sold to Frank D. Madison, attorney for the reorganization committee, at receiver's sale on March 21 for \$7,000,000. Mr. Madison, representing the committee, which consists of Frank B. Anderson, William H. Crocker, Herbert Fleishhacker, E. S. Heller and John D. McKee, submitted the only bid. The sale practically completes the long labors of the reorganization committee. Mr. Madison said after the sale that only about 2 per cent of the United Railroads 4s remained undeposited, and that practically all the Sutter Street Railroad & Omnibus Cable Railway bondholders had agreed to the reorganization plan. The successor company will be known as the Market Street Railway. The terms of the reorganization have been reviewed at length previously in the *ELECTRIC RAILWAY JOURNAL*.

City Protests Expenses of Receivership.—Formal objections to the inclusion of receivership expenses in the cost of the New York Municipal Railway Corporation under its contract with the city have been filed by Transit Construction Commissioner John H. Delaney with Receiver Lindley M. Garrison and also with Daniel L. Turner, chief engineer to the Transit Construction Commission, whose duty it is to determine the propriety of construction costs. Up to Dec. 31, 1920, the receivership expenses aggregated \$472,380, of which \$274,035 was allotted to the rapid transit lines and the remainder to the surface lines which do not come under the contract with the city. The commissioner objects especially to the inclusion of the compensation and allowances for disbursements by the receiver which amounted to \$174,999 and to similar payments for his solicitor Karl M. Owen, \$7,945.

Return of Equipment Sought.—The General Electric Company has become one of the intervenors in the Des Moines (Ia.) City Railway case. It demands \$68,466 from the railway. The suit is brought to intervene in the action by the North American Construction Company. The company seeks to protect its investment in equipment which it has furnished to the Des Moines City Railway. The action is based upon sixteen promissory notes and five contracts signed by officers of the Des Moines City Railway during 1918. In its petition the General Electric Company asks that the federal court recognize the ownership of the equipment in the General Electric Company because of stipulations to that effect in the contract between that company and the railway. If the money is not paid within sixty days the General Electric Company asks a court order directing the Des Moines City Railway to return the equipment.

Traffic and Transportation

Mr. Dana Talks on Spreads

Boston Elevated Railway Explains to Men Difficulty of Eight Hours in Ten

The bulletin for March of the Boston Elevated Railway to its men is devoted to the question of spreads. The four previous bulletins of the company to its men cover principally the questions of earnings and expenses of the property for the previous months.

The question of spread came up on the property through a legislative bill (later abandoned) calling for eight hours in ten. The Boston Elevated schedules are made up on the eight-hour basis, but under the "cover" system, as described by Mr. Dana in an article on page 647 of the issue of this paper for Oct. 2, 1920.

The text of the March bulletin is reproduced below with the diagram which accompanied it:

Operation during the month of February resulted in income exceeding expenses by \$2,887.29.

The severe storm of the twentieth made the problem more difficult but will in no way affect our determination to meet the outstanding deficit by July 1, 1921.

The present working conditions on this railway are probably not equalled on any railway in this country. In view of the fact that an 8 in 10-hour law has been suggested it is of value to study its effect upon

If the guarantee were not continued men who could only secure one-fourth of a day's work could not be held in the service, and a constant change of personnel would occur, which would likewise be a severe burden upon the car riders.

We are co-operating in the common interests of the car riders, and ought to be familiar with facts such as these.

Co-operation means securing all the revenue, avoiding accidents, being considerate of car riders, helping one another, conserving supplies and materials and not wasting time.

Eight-Cent Rate Temporary Solution

The existing rate of fare in the District of Columbia—8 cents, or four tokens for 30 cents—was ordered continued until Aug. 31 by the Public Utilities Commission in an opinion handed down on March 28. Efforts have been made to secure a reduction in the rate of fare. The Capital Traction Company did not ask for a continuation of the existing fare, but stated that a return to the 5-cent fare would not allow it a fair return. It was shown, evidently to the satisfaction of the commission, that the Washington Railway & Electric Company could not secure a proper return on less than the existing rate.

The commission apparently hopes Congress will pass the necessary legis-

Twenty per Cent Advance Utah Road Allowed New Rates, but Refused Return on Appreciation in Value

One-way passenger fares on the Salt Lake & Utah Railroad, the "Orem Road," between Salt Lake City and Payson, Utah, are permitted to be increased 20 per cent by the Public Utilities Commission of Utah in a decision handed down on March 18.

COMMUTATION NOT INCREASED

Round-trip tickets, for which a 20 per cent increase was asked, are permitted to be increased 1.8 per cent of one-way fare. One thousand mile books are increased from 2¼ cents to 2½ cents a mile. No increase is allowed in 500-mile books, commutation tickets or school tickets. The application of the company was filed on Nov. 24, 1920. In it the company asked for a flat increase of 20 per cent on all its rates.

The Orem line at the hearing set up that its actual construction costs, incurred from 1913 to 1917, showed a book value of the property of \$4,823,096. It sought to capitalize appreciations in value which have occurred during the war period. These, it was claimed, would enhance the value of the road by approximately 75 per cent, or \$3,239,675. The company further sought to include in its investment \$1,300,864 as "developmental cost," thus asserting the right to a fair return on a total cost of \$9,363,635, as compared with the book value of the property of considerably less than \$5,000,000.

WAR TIME VALUATION NOT ACCEPTED

These claims of the company the commission dismissed with the following comment:

The commission is not inclined to accept in full a valuation based upon the maxims of war prices applied to property that was constructed and placed in operation before the war prices took effect. This is not intended to exclude consideration of such prices. On the contrary present reproduction cost undoubtedly is one element entering into the present fair value of property, but it is only one element and not necessarily controlling.

Nor does the commission, in passing upon the question here involved, accept at this time as final the statement of book values presented by the petitioner as hereinbefore referred to. Such reference to the figures as has been made is intended merely to indicate that the financial condition of the petitioner is such that under this petition and for the purpose of passing upon the question involved it is not necessary to enter minutely into a consideration of the construction costs.

It was shown that the company had been unable to set up any depreciation reserve for the reason that the net income has not been sufficient to provide for depreciation on all of the property, and that heavy maintenance demands must be met by the railroad company within the next few years from current revenue.

Calculated on the 1920 volume of business it is estimated by the commission that the advances granted will increase the gross revenue of the company by \$6,000 a month. This is a sum about 20 per cent less than the increase asked by the railroad in its petition.

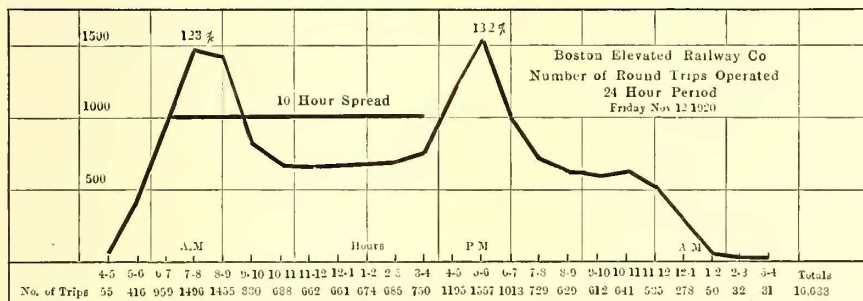


DIAGRAM IN CIRCULAR ISSUED BY BOSTON ELEVATED

the problem of providing street railway transportation.

The accompanying diagram shows the number of trips operated on this system during each hour of the day.

At the present time car service men complete their work with outside hours as follows:

- 27% within 8 hours
- 33% within 9 hours
- 58% within 10 hours
- 71% within 11 hours
- 78% within 12 hours
- 88% within 13 hours
- 100% within 14 hours

This arrangement, in addition to an eight-hour guarantee which amounts to time not actually required in service, to \$600,000 per year, permits all trips being arranged in runs, and the small per cent required to cover both rush hour peaks meets the service requirements of our business.

The line drawn across the chart represents a ten-hour spread and indicates clearly that men operating morning rush hour trips would not be available for afternoon rush hour trips, and consequently more men would be required.

It would require 1,300 more men to operate the system under such a restriction of outside time, and cost the car riders over two millions of dollars.

If the eight-hour guarantee remained under such a plan the new men could only be of actual service one-fourth of their time, and the balance of the time would constitute a heavy burden upon the car riders.

lation to permit the merging into a single organization of the two traction companies and the Potomac Electric Power Company.

Extraordinary Service and Extraordinary Mayor

In announcing his candidacy for re-nomination to the office he has filled for the last three years Mayor Charles R. Hunter of Terre Haute, Ind., told of things accomplished during his term of office. Among these points was the following:

The traction company did its part toward making the necessary repairs along the line of its tracks, except for a strip along Wash Avenue, which will be attended to this spring. * * * Although our people may not realize it we have as good a street car system as there is to be found in the country, and in the face of raising of fares all over the country our people ride at 5 cents. In other cities the fare has been advanced to 7, 8, 9 and 10 cents. Our people save thousands of dollars every year on fares alone.

Electric and Steam Lines Before I. C. C.

Common Issue Made by Railroads in Missouri and Kansas to Prevent Rate Discriminations

The Joplin & Pittsburg Railway, the Kansas City, Kaw Valley & Western Railway and the Arkansas Valley Interurban Railway have asked the Interstate Commerce Commission to adjust their intrastate rates to the interstate basis, and to join the electric road interests with those of steam railroads now pending before the commission. The cases were heard before an examiner of the Interstate Commerce Commission at Topeka on March 24. There will be a final hearing at Washington during April.

IN the case now coming from Kansas careful preparation has been made to establish all the facts in such a way that the analogy between electric and steam road circumstances may be plain. The situation has vital interest for the several electric railways in the Kansas City district, since neither the Missouri nor the Kansas State Commission has raised intrastate steam road rates to coincide with interstate rates fixed by the Interstate Commission.

PARALLELS STEAM RAILWAY CASE

The fact that Clyde Taylor, who prepared the present case for the Joplin & Pittsburg Railway, is also representing the Kansas City, Kaw Valley & Western Railway, has provided a valuable element in the construction of principles of interstate service by electric interurbans. The lines and service of the former are largely interstate; while the lines of the latter are intrastate, but its service largely interstate.

The third party to the present proceedings is the Arkansas Valley Interurban Railway, operating electric lines serving Wichita, Newton and Hutchinson, all within the State of Kansas.

The proceedings relative to the petition of the Joplin & Pittsburg Railway offer the broadest picture of the claim of electric roads to Interstate Commerce Commission intervention. This company operates 104 miles of standard gage road, the chief terminals being Joplin, in Missouri, and Pittsburg, in Kansas. It transports freight and passengers both in state and interstate commerce, files its tariffs with the state and federal commissions, has joint tariffs with the principal trunk lines, competes in both interstate and intrastate passenger and freight business with the Frisco, Southern, Missouri Pacific and Katy railroads. Its situation is therefore exactly the same as that of steam railroads whose intrastate rates, when discriminatory, the Interstate Commerce Commission adjusts in view of interstate rates.

The passenger rate of this company, in Kansas, was increased on March 4, 1920, to 3 cents per mile, and in Missouri was increased on Aug. 1, 1920, to 3 cents per mile. On Sept. 24, 1920, the company filed a passenger rate schedule of 3.6 cents per mile on interstate traffic with the Interstate Commerce Commission, and collected this rate on interstate passenger traffic thereafter. The present proceedings pertain chiefly to passenger rates, but the freight rate discriminations are also displayed. On

Aug. 26, 1920, the interstate freight rates were advanced on this road 35 per cent, and on Nov. 1, 1920, the Kansas freight rate advanced 30 per cent.

When the time came to seek the intervention of the Interstate Commerce Commission concerning readjustment of state rates, it was necessary to show (1) that the intrastate rates were discriminatory, and (2) that the interstate rates, the higher, were reasonable.

The electric line's passenger rate of 3.6 cents was the result of a schedule without hearing upon its reasonableness and hence it did not constitute *prima facie* evidence that the interstate rate was reasonable. While it might appear upon the face of the evidence, therefore, that there was discrimination because of different intrastate and interstate rates, there was need to show definitely that the adverse discrimination was due to inequity of the state rates.

ROAD'S VALUATION STUDIED

The first steps in the present matter, therefore, were similar to those in rate hearings. Before the examiner in Topeka, were brought reports and evidences of the road's valuation, costs of operation and earnings. The low net earnings under the 3-cent intrastate rates were demonstrated, and the increase of earnings on interstate business under the higher interstate rate were also shown. The displays demonstrated that over the period during which the 3.6-cent interstate rates prevailed, the company's net earnings on interstate passenger business were small—much below fair return on approved valuation.

It was shown also that had the rates within Kansas and Missouri been equal to interstate rates during the whole period the returns net, would have been inadequate—assuming that the higher rate would not have reduced patronage. This evidence demonstrated the fairness and indeed the necessity of a 3.6-cent rate for intra and interstate traffic, and directly upheld the premise that the 3.6 interstate rate was reasonable. The evidence as to discrimination, therefore, put the burden of the discrimination on the unjustly low state rate. Many instances were advanced to show discrimination. Mr. Taylor proved that not only does the difference between the intrastate and interstate passenger rates cause discrimination against interstate business, but it enables the actual interstate passenger to defeat, in part, the interstate rate.

The electric railways are, in these proceedings, coming before the Interstate Commerce Commission on exactly the same footing as steam roads. Indeed, the whole subject now is presented as one matter, the electric and the steam lines being associated in the presentation. Attorneys for the two classes of transportation are co-operating and jointly preparing the cases and the issues are joined before the commission in the effort to secure a needed adjustment of rates for railroads, whether electric or steam, in cases where discrimination exists and is shown to exist. The proceedings are entitled "in the discrimination of Kansas intrastate passenger and freight rates and charges as against interstate rates and charges," I. C. C. No. 11916.

Fare Increase Suspended

New Jersey Road Must Quit Unless Adequate Relief Is Secured Through Increased Rates

Proposed collection of 10-cent fares in 142 municipalities in which the Public Service Railway operates in New Jersey was suspended on March 29, for a further period of three months by the new Public Utility Commission. This action was taken after Thomas N. McCarter, president of the Public Service Corporation, had testified before the commission that unless adequate relief is provided by increased revenues the Public Service Railway must go out of business. Mr. McCarter said:

Public Service Railway would have been in the hands of a receiver long ago but for the fact that its stock is held by Public Service Corporation, which has been paying its deficit and keeping it alive. At the end of last year when the railway presented its application for increased rates, the situation had become most acute. The company's funds and credit had been exhausted and Public Service Corporation, in justice to its other underlying companies (Public Service Gas and Public Service Electric) was no longer in position "to hold the bag."

When the hearing began on March 29 Governor Edwards had not yet signed the bill passed the night before in the Senate giving the new commission power to suspend increased rates for a further period of three months. Therefore, the board was confronted by the alternative of terminating the hearing within three days or permitting the increase to become effective automatically. Governor Edwards, however, signed the bill during the afternoon, whereupon the board continued the previous order of suspension, which expired on April 1, and adjourned the hearing until April 7 when it will be resumed in Newark.

Mr. McCarter was the only witness examined. He said the actual loss sustained by the railway, during the last three years, including the shortage in the depreciation account fixed by the board, amounted to \$3,700,000. He contended that instead of allowing \$800,000 a year for depreciation the amount should be not less than \$1,200,000. The company, he said, should expend immediately \$2,000,000, representing the accrued shortage in its renewal

account plus the whole sum allowed for depreciation for the present year.

Public Service Railway, Mr. McCarter said, carried 363,000,000 cash-paying passengers last year. He estimated that with a 10-cent fare this number would be decreased by 50,000,000 during the present year.

As estimated by Mr. McCarter the cost of operation for 1921, including \$1,200,000 for current amortization and \$600,000 in part payment of the shortage in depreciation, will amount to \$30,000,000. He estimated that a 10-cent fare will yield a revenue of \$31,000,000. He explained that experience has shown a 40 per cent increase in rates results in a 15 per cent increase in revenue due to the fact that rate increases decrease the number of riders.

With jitney competition eliminated Mr. McCarter thought it would be possible to exist with a 10-cent fare for casual riders, including a free transfer, and an 8½-cent ticket fare.

Mr. McCarter said that since 1917 wages have increased from \$6,250,000 to \$13,500,000; the cost of coal from \$3.50 to \$8.25 a ton delivered at the power station; taxes were raised \$2,700,000 last year with a further increase in prospect, and steel rails have practically doubled in price. These four big items, he said, tell the story.

One-Man Cars in Syracuse and Utica

One-man cars have been adopted for use by the New York State Railways on its Utica and Syracuse lines as a retrenchment policy, pending the granting of a fare increase by the Public Service Commission, for both cities. The one-man operation has been adopted on diverse types of cars, the first attempt to change the system being made on the Blandina Street line in Utica, a light traffic line, where single-truck cars had always been used. The single-truck cars were continued in operation, passengers entering by the front door and paying fares upon entrance.

Finding that this policy was successful and met with the co-operation of the public the South Street and Eagle Street lines in Utica were changed to one-man operation. Peter Witt model and J. G. Brill pay-as-you-enter type cars were used on these lines, passengers entering by the front door only.

In Utica passengers outbound from the downtown districts, pay as they leave while passengers inbound pay as they enter. Thus far such a policy has met with success. B. N. Tilton, vice-president and general manager of the concern, states that the one-man cars have been put on to stay.

In Syracuse the one-man cars were introduced on the Green Street line, a route lightly patronized where single-truck cars are operated. Five of the Syracuse city lines are designated for early conversion into one-man type service cars. Several of the lines are to be consolidated while one will be re-routed to make a shorter route in response to the petitions of patrons.

Transportation News Notes

New Transfer System Postponed.—The new transfer system on the Los Angeles (Cal.) Railway planned to be put into effect on April 3 has been postponed until May 1. The details of the transfer scheme were given in the ELECTRIC RAILWAY JOURNAL issue of March 19.

Needs Increased Fares.—The Southern Pacific Company has filed application with the Public Service Commission for permission to increase fares on its Oregon lines in the cities of Salem, Eugene, Springfield and West Linn. Advances sufficient to yield a 7 per cent return on the investment are asked.

Wants Seven Cents a Zone.—The Frankford, Tacony & Holmesburg Railway, Philadelphia, at a recent hearing before Public Service Commissioner Clement, petitioned for a 7-cent zone fare. The company alleges that it will not be able to continue service between Frankford and Torresdale unless a fare increase is permitted.

Complaint Against Six-Cent Fare Dismissed.—The Public Service Commission at Harrisburg has established a valuation of \$1,300,000 for the properties of the Shamokin & Mount Carmel Transit Company, which operates in Mount Carmel, Pa., and has dismissed complaints against a 6-cent fare established in 1918. Subsequently the War Labor Board allowed a 7-cent fare.

Fare Rise Suspended.—The Public Service Commission has suspended until July 16 the 10-cent fare schedule sought by the St. Joseph Railway, Light & Power Company, St. Joseph, Mo. The advance was to have gone into effect on March 18. The present rate of two fares for 13 cents will remain in force unless in the meantime the commission should decide favorably on the railway's application.

Jitneys Barred Outside City.—As a result of a new law passed in the recent Legislature no stage lines or jitneys can be operated outside the city of Spokane, Wash., without a certificate of necessity issued by the State Public Service Commission. Stage lines now in operation within the city are not included in the new ruling. Jitneys were ruled off the streets of Spokane almost three years ago.

Jitney Business Thrives.—During the past few months several jitney buses have started operating along the principal streets in Evansville, Ind. For several years there was only one bus in the city. It was run from Main Street to Washington Avenue. Now in addition to the regular jitneys several buses meet the factory workers and

haul them to their homes. The large number of jitneys now in operation is due largely to the fact that so many men out of employment find this a way of making a fair living.

Fare Increase Suspended.—The Board of Public Utility Commission has notified the Trenton & Mercer County Traction Corporation, Trenton, N. J., that it cannot put the proposed 10-cent fare into effect until May 28, unless the board in the meantime favorably disposes of the company's application, which has been pending since November. This company will make application to the Supreme Court for a review of the suspension order and the judicial determination of the right of the utility board to grant a suspension for six months.

Council Rejects Six-Cent Fare.—The City Council of Akron, Ohio, has denied the petition of the Northern Ohio Traction & Light Company for a flat 6-cent cash fare. The traction company forwarded a communication to the Council recently stating that it was losing money on a 5-cent fare, the rate now in effect on the city lines. The emergency 5-cent cash fare ordinance passed by the Council expires on April 1. The company has indicated it wants a 7-cent cash fare from April 1 until a new franchise for the city lines is passed by the council and accepted by the company.

Non-Stop Interurban Service Advertised.—The Puget Sound Electric Railway, operating an electric interurban between Seattle and Tacoma, Wash., has undertaken a campaign of advertising in both Seattle and Tacoma daily newspapers, calling attention to the "Interurban Flier," non-stop between the two cities, starting on March 21, with round-trip fare of \$1. The advertisements urge that shoppers in both cities watch the daily advertising of merchants in the local papers, and plan their purchases accordingly. The company is making a strong effort to build up this "Shoppers' Special Train," and to increase traffic between the two cities.

Power Rates Too High.—At a recent hearing on the Dallas Railway's application for a 7-cent fare it was brought out that the railway would have made more than its 7 per cent return during the last six months of 1920 if fuel oil had been bought at its present price of \$1.50 a bbl. In connection with its power rates the Board of Commissioners has requested the Dallas Power & Light Company to appear at a meeting to consider power rates now in effect and the proposed new schedule which the light company has declared it will charge the Dallas Railway in the future. The Mayor has requested a full expense report from the railway showing what return the company probably will make in 1921 on a 6-cent fare and what return on a 7-cent fare. He has said that everything will be done to expedite the hearings of both utilities so that the city may reach a decision in the near future.

Personal Mention

J. P. Pulliam, President

Railway Executive Chosen to Head Wisconsin Electrical Association for Ensuing Year

J. P. Pulliam, who for several years has served as secretary of the Wisconsin Electrical Association, was elected president at the annual meeting in Milwaukee on March 24. Mr. Pulliam takes the place of W. C. Lounsbury, general manager of the Superior Water, Light & Power Company, Superior, Wis. Mr. Pulliam is vice-president of the Wisconsin Public Service Company, of the Evanston (Ill.) Railway, and vice-president and general manager of the Wisconsin Railway, Light & Power Company.

Mr. Pulliam became connected with the electric railway field after a number of years' experience in steam railway work with the Louisville Southern Railway at Louisville, Ky., and with the Choctaw & Oklahoma Railway Company at Shawnee, Okla. Later he engaged in commercial pursuits for a year and then served as trainmaster for the Grand Rapids, Grand Haven & Muskegon Railway for three years. He left that company to become superintendent of the Winnebago Traction Company, Oshkosh, Wis.

When the Wisconsin Electric Railway purchased the Winnebago Traction Company in 1908 Mr. Pulliam served the former company and the Eastern Wisconsin Railway & Light Company as general superintendent. He was later given a similar position with the same company in Fond du Lac, Wis. In 1917 he was elected vice-president and placed in charge of the operation of the Wisconsin Public Service Company, continuing in this position to date.

John Whitsell Assumes Management of Winnipeg Railway

John Whitsell, whose appointment as operating manager of the Winnipeg (Man.) Electric Railway was announced in the *ELECTRIC RAILWAY JOURNAL* a short time ago, assumed his new duties on March 15.

He began his career in the electric railway industry in 1891 when he entered the car service department of the Sioux City Traction Company, Iowa, now known as the Sioux City Service Company. In 1897 Mr. Whitsell went to work for the Suburban Railroad, Chicago, as a shopman, later advancing to master mechanic, and then to superintendent in 1900. In 1912 he became superintendent of equipment and general superintendent of transportation of the County Traction Company, Chicago, which, the following year, was combined with the Suburban Railroad to make

the Chicago & West Towns Railway, of which he became general superintendent. In May, 1920, he was made general superintendent of the Chicago & Interurban Traction Company, which position he left to go to Winnipeg.

V. B. Phillips, Consultant

Assistant to Vice-President of Cleveland Railways Joins Mr. Crecelius in Engineering Firm

Victor B. Phillips has resigned as assistant to the vice-president and as acting superintendent of power of the Cleveland (Ohio) Railway to become associated with L. P. Crecelius in the firm of Crecelius & Phillips, consulting, constructing and operating engi-



V. B. PHILLIPS

neers. The resignation of Mr. Crecelius as superintendent of power of the Cleveland Railways was announced in these columns on Jan. 22.

Mr. Phillips has been associated with the Cleveland Railway since 1911. He is a graduate of Cornell University with the degree of mechanical engineer.

Immediately after the outbreak of the war Mr. Phillips joined the army and served with the rank of captain in the 113th Engineers. After the armistice he was attached to the American Commission to negotiate peace, first in connection with the valuation of war damages, and later with Bernard M. Baruch, economic adviser to the commission. From April to September, 1919, Mr. Phillips served with the United States Liquidation Commission in Paris and had charge of disposing of surplus army stocks.

At the present time he is serving as expert on the American Committee on Electrolysis and is a member of the engineering executive committee of the National Safety Council. Papers and articles by Mr. Phillips on electric railway and power subjects have ap-

peared frequently in society transactions and in the technical journals.

The firm of Crecelius & Phillips will engage in general engineering practice. At the present time the firm is acting as engineers for several electric railway and public utility companies.

Promotions on Interurban

H. G. Hardin Made Superintendent and H. A. Otis His Assistant on Chicago Road

Harry G. Hardin and Harold A. Otis have been appointed general superintendent and assistant general superintendent, respectively, of the Chicago & Interurban Traction Company, Chicago, upon the order of Britton I. Budd, president of the company. Mr. Hardin has been with the elevated railways in Chicago for nearly twenty years, having begun this service on Oct. 4, 1901, as a trainman with the Metropolitan West Side Elevated Railway. During the following ten years he worked up through the train and yard service and in 1911 was appointed superintendent of transportation of the Chicago & Oak Park Elevated Railroad. He served in this capacity until April, 1920, when he was brought into the main office of the elevated companies as an assistant to M. J. Feron, general superintendent of transportation. He served in this office until his recent appointment in immediate charge of the Chicago & Interurban Traction Company, an interurban line connecting Chicago with Kankakee, Ill.

Mr. Otis began his work with the railways as a night electrician for the South Side Elevated Railroad after his graduation in 1912 from the electrical engineering department of the University of Illinois. In September of that year he was transferred to the office of superintendent of equipment of the several elevated railways. He has been engaged in the engineering and operating department since that time, his jurisdiction in mechanical matters having been extended lately to include the Chicago-Kankakee interurban.

N. H. Brown Resigns from New Orleans Railways

Nelson H. Brown, superintendent of transportation of the New Orleans Railway & Light Company, New Orleans, La., has resigned and A. B. Paterson has been appointed acting general superintendent in his stead. Mr. Paterson comes from Meridian, Miss., and became identified with the New Orleans Railway & Light Company last July as special engineer for General Manager A. L. Kempster. He was formerly with the Henry L. Doherty interests and has had about seventeen years' experience in the public utility business.

Mr. Brown went to New Orleans from Buffalo, where he was general superintendent of the International Railway. He has had an extensive experience in railway service, having been connected previously with the street railways of Syracuse, Worcester and Albany.

H. M. Platt has recently been appointed editor of the N. E. L. A. *Bulletin* and assistant to the director of publicity. Mr. Platt was at one time on the editorial staff of the *ELECTRIC RAILWAY JOURNAL*, having previously been in the business department of the McGraw Publishing Company as a field representative on several of its publications.

F. E. Schornstein, formerly local manager at Red Wood, Minn., of the Wisconsin-Minnesota Light & Power Company, has been made district manager for the same company at Eau Claire, Wis., in charge of the local street railway system in Eau Claire and Chippawa Falls and the interurban line connecting these two cities and Altoona.

V. Chisholm has resigned his position as superintendent of the railway department of the Knox County Electric Company, Rockland, Me., after having served thirty years in the railway department of that company. Charles E. Gregory, who has been in charge of the operation of the power station equipment at Rockland for several years, has been appointed to fill the vacancy. Mr. Gregory will have full charge of the railway department and power station equipment.

R. L. Ellis has been appointed manager of the Miami Beach Electric Company's new \$250,000 plant which furnishes Miami Beach, Fla., with its light, and power for both industrial and railway use. Mr. Ellis was formerly with the Birmingham Railway, Light & Power Company, Birmingham, Ala., and previous to that was connected with the Selma (Ala.) Electric Railway Company. After making a complete survey of the transportation situation, Mr. Ellis has recommended a ten-minute schedule between Miami and Miami Beach and has taken steps toward the procuring of additional rolling stock to permit maintaining that schedule and building up adequate and efficient service.

Benjamin F. Cleaves, chairman of the Maine Public Utilities Commission since its establishment in 1914, has tendered his resignation to take up the management of the Associated Industries of Maine, with headquarters at Augusta. Chairman Cleaves is a native of Waterboro, Me., and was graduated from the Biddeford High School in 1885. He read law in the offices of Hamilton & Haley, was admitted to the bar in 1892, and practiced law at Biddeford thenceforth, ultimately becoming a member of the firm of Cleaves, Waterhouse & Emery. With the establishment of the Maine commission he sought to create an understanding between the utilities, the public and the commission which was peculiarly adapted to the conditions prevalent in Maine and which has borne fruit in a regulation of marked breadth of view, straightforward action and a sane and sympathetic realization of the problems of public utility service and financing.

Statue to Railway Founder

Permanent Memorial Erected in Minneapolis to Founder of Present Twin City Rapid Transit Company

Few electric railway men who knew Thomas Lowry of Minneapolis, Minn., and cherish recollections of him are perhaps acquainted with the fact that a monument by Karl Bitter has been erected to the memory of the founder of the Twin City Rapid Transit Company. The bronze statue stands in Virginia Triangle, Minneapolis, at the intersection of Hennepin and Lyndale Avenues. It was unveiled on Aug. 18, 1915, and presented to the city by the Lowry Memorial Association, formed among Mr. Lowry's friends and associates shortly after his death on Feb. 4, 1909.

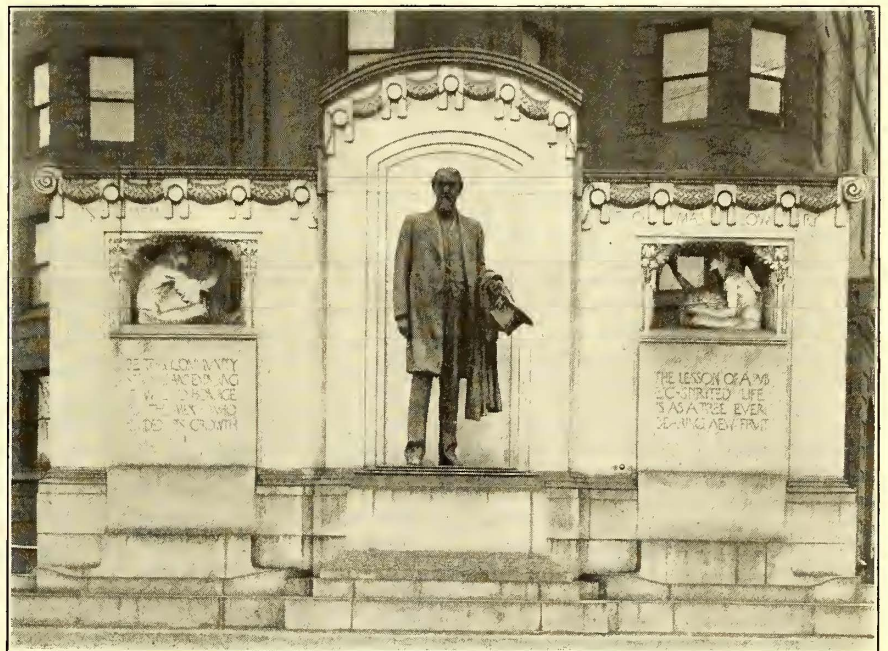
"Tom" Lowry was born Feb. 27, 1843, on a farm in Logan County, Ill. He was admitted to the bar in 1867. The

cities. To this his own unaffected modesty and high personal character largely contributed."

The accompanying illustration of the memorial is published through the courtesy of the *Minneapolis Journal*.

Obituary

J. B. Robbins, at one time superintendent of the Chattanooga Railway & Light Company, Chattanooga, Tenn., died on March 16 in St. Paul, Minn. Mr. Robbins began business as a railroad contractor. He was also a business associate of the late C. G. Goodrich, president of the Twin City Rapid Transit Company. Mr. Robbins was born in Kentucky in 1862.



MEMORIAL TO "TOM" LOWRY, FOUNDER OF TWIN CITY RAPID TRANSIT

same year he opened a law office in Minneapolis and a few years later was made judge of the Hennepin County Court of Common Pleas. After the panic of 1873 Mr. Lowry turned his attention to the struggling street railway in Minneapolis, with which he was afterward continuously connected, at first as vice-president and later, when the systems in Minneapolis and St. Paul were consolidated, as president. In the early days of the American Electric Railway Association Mr. Lowry took a very active interest in its affairs and in 1890 was elected president of the association.

He was very popular, especially in the Twin Cities. One of the newspapers in eulogy of Mr. Lowry said editorially: "No man envied his wealth, for it was well earned and well spent. If for nothing else, he was remarkable for making his traction company the most popular institution in two great

Benjamin B. Lawrence, mining engineer and a director of the Washington Water Power Company, Spokane, Wash., and of other corporations, is dead. Mr. Lawrence was graduated from the School of Mines, Columbia University, in 1878. He went West and engaged in gold and silver mining in the Gilpin district of Colorado. Returning to New York he established an office as a consulting engineer.

Samuel T. Murdock of Indianapolis, who has been prominent in the promotion of Indiana's traction lines, died on March 21 after a week's illness. Mr. Murdock was secretary of both the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway, South Bend, Ind. He was also interested in the Union Traction Company of Indiana, Anderson, and had been recently named as a director of that company. Mr. Murdock was fifty-three years old.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,

SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

Good Supply of Track Bolts, Nuts and Spikes

Prices Are from Twenty to Forty per Cent Below Peak—Buying Mostly for Repairs

Producers of railroad spikes, bolts and nuts have accumulated a reasonable reserve supply sufficient to make deliveries of all standard material from stock, but there is a growing tendency to curtail production. This is natural in view of the light demand, and large jobbers who sell to railroads are also keeping their supplies down as low as they consistently can. Although there seems to be nothing tangible on which to base expectations of still greater price declines in this line producers report that consumers are apparently entertaining such hopes. The reduction from peak prices of spikes and bolts to date has been considerable, ranging from about 20 to 40 per cent with different companies, and in a representative instance amounting to \$12 to \$15 a ton on spikes and \$20 to \$30 per ton on bolts and nuts.

Producers are of course hopeful of improvement in demand, though they see few signs of it in the present market. Steam railroads last fall gave every indication of heavy buying of track material this spring and in fact did enter the market in fair volume the first of the year. This buying came nearly all at one time, however, and then petered out. For the past six weeks there has been very little activity either in the foreign or domestic field, and to date there is not much indication that railways will do more than repair roadbeds this year.

The current base price of track bolts and nuts is about 5 cents in car lots and 6 cents in lesser quantities, while standard railroad spikes are 3.65 cents and 4.65 cents by the same differentiation.

Immediate Deliveries of Track Tools

Manufacturers Differ Over Prospect for Demand Improving—Stocks Held to Low Levels

In view of present market conditions both manufacturers and jobbers of track tools such as picks, shovels, etc., report that they are keeping stocks low. Some companies, however, still have a considerable supply of high-priced goods on their hands on which it has been necessary to take a loss. In general immediate deliveries are made. The reduction from peak prices reported by different producers ranges from 10 to 30 per cent, though for some

time the market has held steady. There seems to be some feeling of uneasiness in the trade regarding steel quotations, and the possibility of lower prices is perhaps a contributing factor in keeping both stocks and buying at low levels.

Some producers are optimistic over a return of fairly good business before the year is out, others are not. On the one hand it is pointed out that through such factors as the payment of money owed by the government to steam roads, the inauguration of wage cuts and higher rates for many electric lines, some hope of improvement is offered. On the other hand, it is stated that railways in general apparently have no money, that steam roads have in

large part already expended the payments that are anticipated from the government and that the last half of the year will be too late for manufacturers in this line to receive good orders.

Thus far in 1921 it seems that the railroads of the country, both steam and electric, are going to buy only such track tools as are actually needed for necessary repairs, and even these in light volume. The foreign market is off, too, though there is quite a strong demand reported from South America and a large potential demand undoubtedly exists in Europe. Exchange rates are prohibitive as they affect the placing of orders in this country, however, and foreign competition is keen.

Justification of Present Prices Up to Manufacturer, Say Railways

Reduction of Prices Would Stimulate Buying, Is General View—Willingness of Producers to Take Losses on Stocks of High-Priced Material Is Questioned

Since the views of representative manufacturers of electric railway equipment on the subject of prices were published in the issues of Feb. 5 and 12, a number of letters have been received from electric railway officials. These letters differ with some of the points that producers make and present new evidence, in addition to that contained in the Feb. 26 number, as to how traction companies generally regard the question of price reductions on electric railway material.

The general tenor of the replies of the electric railways that were heard from appears to be that the burden of proof should rest upon the manufacturer as to why greater reductions in price are not made. There is also a decided feeling in many cases that prices of railway material are still out of line with lowered costs. Such items as steel, ties, wheels, track material, paints and varnish, overhead material, air and electrical car equipment, power station and substation equipment are among the things that are specifically mentioned.

Unwillingness of some manufacturers to take losses upon stocks of high-priced material is mentioned by more than one electric railway as the cause of prices being maintained. An official of a representative Middle-Western traction company believes that manufacturers in this field made large profits during the period of rising prices and now, if well organized, should be able to take some losses. This is the only way to relieve the present stagnated

condition of the market, he thinks. A purchasing agent for another property corroborates this view and states that electric railways are trying to place as near normal orders as they can where manufacturers have shown a willingness to take losses the same as has been done in other industries. Where producers have held out for prevailing high prices, however, this company is following a policy of curtailing purchases to the lowest possible level commensurate with absolute needs.

The practice of maintaining railway equipment prices where possible finds some defense from the president of an electric railway in the East, however. This official believes in a policy of buyer versus seller, and if a manufacturer is able to obtain business sees no reason why prices should philanthropically be cut. He goes on to say, however, that some manufacturers are undoubtedly displaying poor judgment in not passing lowered costs on to the consumer as a means of increasing present low demand.

Manufacturers in general, as stated in previous issues, have questioned whether price cutting would stimulate buying to any extent. The buying end of the industry is by no means agreed over this point either, but judging by reports received from several representative railway officials greater buying would undoubtedly follow decided price reductions.

These men report that extensions in some instances are being held back awaiting lowered costs, and that con-

sumers would stock more goods instead of buying from hand to mouth if prices really represented a profitable investment.

The most common explanation offered by manufacturers for maintaining prices is that freight charges and labor costs preclude reductions. The purchasing department of a Western electric railway disputes this view on the ground that freight charges are unimportant in the final price of most products and that labor cost, even where no reduction in wages has been made, is now less, due to greater efficiency of workmen.

Another important factor in prices of railway material today is probably overhead expenses. In this connection the general manager of a large traction company in the north-central section points out that the industry at present is largely over-factored because of wartime expansion. Some of these factories must be closed down or converted to other industries, he thinks, for to continue full operation means 100 per cent overhead on a limited output.

Victoria, Australia, Asks Tenders on Steel Poles and Copper Cable

Tenders are invited by the State Electricity Commission of Victoria, Australia, for 600 steel poles for carrying three, three-phase, 22,000-volt feeder cables and two metallic return telephone circuits, and for 250 miles of hard-drawn copper cable for the Morwell power scheme. Copies of specification No. 47, covering the steel poles, and specification No. 66, covering the copper cable, have been forwarded by A. W. Ferrin, trade commissioner, and have been placed on sale at the Bu-

reau of Foreign and Domestic Commerce, district offices, 734 Custom House, New York City, and 1424 First National Bank Building, Chicago. Tenders must be received at the office of the Electricity Commission, Melbourne, Australia, by May 31, 1921.

South African Railways Request Bids

In connection with the forthcoming electrification of the Durban to Pietermaritzburg and Cape Town to Simons Town lines of the South African Government Railways, the High Commissioner for the Union of South Africa has invited tenders for rolling stock, electrical equipment, etc.

Copper Market Tending Higher

Steps leading to a further drastic cut in copper production have now been taken, and as a result several large mines have closed down entirely. This factor in the market, together with the firm price stand that has all along been taken by large producers, has brought about a decidedly firmer tone. Prices have advanced about 1/4 cent since last week's report, and the minimum quotation for prompt delivery is now 12.50 cents. Large producers are still holding to prices of 12.75 to 13 cents per pound for copper delivered over the next two to three months and are reported to have made sales at these figures.

Consumers have apparently decided that nothing is to be gained by holding off longer from covering their needs, and as a result domestic buying interest is decidedly greater. Whether this is but a temporary condition it is,

of course, yet too early to say. The most recent companies to suspend operations temporarily are the Anaconda, Utah, Ray, Chino and Nevada Consolidated copper mining companies.

Rolling Stock

The Androscoggin and Kennebec Railway Company, Lewiston, Me., is building in its own shops one 40-ft. steel underframe, motor, gravel flat car.

Brooklyn (N. Y.) Rapid Transit Company is considering with a number of car builders and the Safety Car Devices Company the adaptation of several hundred double-track cars on its surface lines to the safety car principle.

The Monmouth County Electric Company, Red Bank, N. J., has purchased four fifteen-bench, double-truck, open summer cars and six double-truck closed cars. The above rolling stock, it is announced, is not new but in first-class condition and will replace single-truck cars now in use.

Track and Roadway

British Columbia Electric Railway, Vancouver, B. C.—The British Columbia Electric Railway is planning to make an extension from Cloverdale to Blaine. An extension is also contemplated from Huntington, B. C., to Bellingham, Wash.

Denver (Col.) Tramway.—The Denver Tramway will begin improving its lines as a result of the recent fare advance. New steel rails will be laid

NEW YORK METAL MARKET PRICES

	Mar. 2, 1921	Mar. 30, 1921
Copper ingots, cents per lb.	12.50	12.75
Copper wire base, cents per lb.	15.25	15.00
Lead, cents per lb.	4.00	4.10
Nickel, cents per lb.	41.00	41.00
Zinc, cents per lb.	5.10	5.15
Tin, cents per lb.	29.37	29.37
Aluminum, 98 to 99 per cent, cents per lb.	28.00	28.00

OLD METAL PRICES—NEW YORK

	Mar. 2, 1921	Mar. 30, 1921
Heavy copper, cents per lb.	10.25 to 10.50	9.50 to 10.25
Light copper, cents per lb.	8.00 to 8.25	7.00 to 8.50
Heavy brass, cents per lb.	6.00 to 6.50	5.50 to 5.75
Zinc, old scrap, cents per lb.	3.00 to 3.12	2.87 to 3.00
Yellow brass, cents per lb.	4.00 to 4.25	4.00 to 4.25
Lead, heavy, cents per lb.	3.25 to 3.50	3.25 to 3.50
Steel car axles, Chicago, per net ton	16.50 to 17.00	14.50 to 15.00
Old car wheels, Chicago, per gross ton	18.00 to 18.50	13.50 to 14.00
Steel rails (short) Chicago, per gross ton	15.50 to 16.00	12.00 to 12.50
Steel rails (rerolling), Chicago, gross ton	15.00 to 15.50	12.00 to 12.50
Machine shop turnings, Chicago, net ton	6.50 to 7.00	5.50 to 3.00

ELECTRIC RAILWAY MATERIAL PRICES

	Mar. 2, 1921	Mar. 30, 1921		Mar. 2, 1921	Mar. 30, 1921
Rubber-covered wire base, New York, cents per lb.	16.50	16.50	Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.70 to 3.95	3.70 to 3.95
Weatherproof wire base, New York, cents per lb.	17.50	17.50	Car window glass (single strength), first three brackets, A quality, New York, discount*	77%	77%
Standard Bessemer Steel Rails, per gross ton	45.00	45.00	Car window glass (single strength), first three brackets, B quality, New York, discount	77%	77%
Standard open hearth rails, per gross ton	47.00	47.00	Car window glass (double strength, all sizes, A quality), New York, discount	79%	79%
T-rail, high (Shanghai), per gross ton, f.o.b. mill	.....	.....	Waste, wool, cents per lb.	11 to 17	11 to 17
Rails, girder (grooved), per gross ton, f.o.b. mill	.....	.....	Waste, cotton (100 lb. bale), cents per lb.	9.00 to 14.00	9.00 to 13.00
Wire nails, Pittsburgh, cents per lb.	3.10 to 3.25	3.00 to 3.25	White	7.00 to 11.00	7.00 to 11.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	3.65	3.65	Cl-rod	.....	.....
Tie plates (flat type), cents per lb.	2.75	2.75	Asphalt, hot (150 tons minimum), per ton delivered	40.00	40.00
Tie plates (brace type), cents per lb.	2.75	2.75	Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton	36.00	36.00
Tie rods, Pittsburgh base, cents per lb.	6.00	6.00	Asphalt, filler, per ton	36.00	36.00
Fish plates, cents per lb.	2.75	2.75	Cement, New York, per bbl.	4.10	3.50
Angle bars, cents per lb.	2.75	2.75	Linseed oil (raw, 5 bbl. lots), New York, per gal.	.72 to .73	.68 to .70
Rail bolts and nuts, Pittsburgh base, cents per lb.	5.50	5.00	Linseed oil (boiled, 5 bbl. lots), New York, per gal.	.74 to .75	.70 to .72
Steel bars, Pittsburgh, cents per lb.	2.00 to 2.35	2.00 to 2.35	White lead (100 lb. keg), New York, cents per lb.	.13	.13
Sheet iron, black (24 gage), Pittsburgh, cents per lb.	3.85 to 4.20	3.70 to 4.20	Turpentine (bbl. lots), New York, per gal.	.57 to .59	.54
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb.	4.80 to 5.25	4.55 to 5.25			
Galvanized barbed wire, Pittsburgh, cents per lb.	3.85 to 4.10	3.85 to 4.10			

* These prices are f.o.b. works, with boxing charges extra.

on the Stout and Kalamath Street lines to replace several blocks of old track which will be torn up.

St. Petersburg (Fla.) Railway.—The St. Petersburg City Commission has ordered an election to be held on April 19 to vote on a bond issue of \$260,000 of which \$65,000 of bonds will be issued to build an extension of the street railway, which is municipally owned, out First Street and a loop around by First Avenue. Citizens have pledged to buy the bonds at par if they can't be marketed otherwise.

Evansville, Ind. — Benjamin Bosse, Mayor of Evansville, Ind., assured a delegation of more than 400 people at a hearing a few days ago of his assistance in getting an extension of the car lines through Howell, a suburb of Evansville. The matter has been referred to the railroad committee of the Evansville City Council for action.

Indiana Public Service Corporation, Fort Wayne, Ind.—R. M. Feustel, president of the Indiana Public Service Corporation in securing permission to double track the line on Pontiac Street to the city limits has answered the objection that the street is too narrow. Mr. Feustel has stated that Pontiac Street is the only through street south of the railroad along which the line could be built and though the pavement is narrow there are possibilities of widening it and making it the logical thoroughfare east of Calhoun Street and south of Creighton Avenue.

Power Houses, Shops and Buildings

United Railways, St. Louis, Mo.—The United Railways is planning the building of four electric plants at a cost of \$285,000.

Omaha, Lincoln & Beatrice Railway, Lincoln, Neb.—The Omaha, Lincoln & Beatrice Railway has completed a concrete and steel carhouse and shops.

Alabama Power Company, Montgomery, Ala.—The Public Service Commission has granted a certificate of necessity for the construction of a large power unit near Lock 12 on the Coosa River to the Alabama Power Company. The company has also received permission for the construction of a transmission line from Roanoke to Lafayette and another from Auburn to Tuskegee.

Indiana Service Corporation, Fort Wayne, Ind.—Power for the street cars in Fort Wayne, Ind., will be supplied from a new substation to be erected by the Indiana Service Corporation at the corner of Melita and Webster Streets. The ground has been purchased and the preliminary work on the construction of the building is under way. The plant will be housed in a one-story brick building measuring 40 ft. by 80 ft. Motor generator sets will be removed from the company's main plant on Spy Run Avenue to the new station.

Laconia Street Railway, Laconia, New Hampshire.—The Laconia Street Railway expects within the next six months to purchase one 200-kw. synchronous motor-generator set.

Professional Notes

Louis T. Klauder has resigned as construction engineer of the Philadelphia Rapid Transit Company and has opened offices in the Pennsylvania Building, Philadelphia, as a consulting engineer specializing in power plant design and construction.

C. G. Young, consulting engineer, has organized the C. G. Young Company, Inc., to act as consulting engineers. The field of the new company will include, among other engineering work, that of the investigation and placing of new and fundamental inventions and processes, as well as to assist manufacturers to take on new lines of manufacture which would be of profit to them. Mr. Young's experience in domestic and foreign fields extends over thirty years, and a considerable part of this time he has been engaged in public utility engineering. The headquarters of the company will be at 501 Fifth Avenue.

Trade Notes

The Waterbury Battery Company, Waterbury, Conn., announces the election of E. E. Hudson as president and Francis T. Reeves, treasurer.

Austin Machinery Corporation, manufacturer of concrete mixing machines, etc., lost several buildings by fire at its Winthrop Harbor, Ill., plant on March 22. The damage will not in any way interfere with production and prompt delivery of its products, however, it is announced, as the company's plants at Muskegon, Mich., and Toledo, Ohio, are well equipped to care for customers.

Electrifying Rumanian Railroads.—The Bukarest government is considering the electrification of a number of its railroads. Large orders have already been placed in Germany, the Orenstein-Koppel Works alone having received orders to the amount of 90,000,000 marks. It is reported that additional orders will be placed in the near future.

Swedish Commission to Study Swiss Electrification.—Advices from Switzerland state that during the next few weeks a commission of foreign engineers will visit Switzerland for the purpose of studying the electrification of the Swiss railroads. The commission will be composed of three American and three Swedish engineers. Mr. Oefverholmen, the Director General of the Swedish State Railways, heads the commission. The foreign engineers will inspect the Gotthard and Lotshberg lines and the large new power stations on both of these lines.

The Refractories Manufacturers Association, at its annual meeting March

16 to 18, in New York, re-elected the following officers: J. D. Ramsey, Elk Fire Brick Company, St. Marys, Pa., president; J. L. Green, Laclede-Christy Clay Products Company, St. Louis, Mo., vice-president; C. C. Edmunds, McLain Fire Brick Company, Pittsburgh, treasurer; F. W. Donahoe, 840 Oliver Building, Pittsburgh, the association's executive offices, secretary; E. M. Durant of the Pacific Clay Products Company, Los Angeles, Frank J. Helwig of the Standard Fire Brick Company, Pueblo, Col., and C. E. Kapitzky of the Federal Refractories Company, Cleveland, were elected to the executive committee.

The United States Rubber Export Company, 1790 Broadway, New York, as distribution unit of the United States Rubber Company in foreign fields, has new branches in process of being opened in Batavia, Java, as the Dutch East Indies branch, in Brussels, Belgium, and in Copenhagen, Denmark. A full line of electrical conductors, insulating friction tape and rubber splicing tape is to be carried in each branch, as is now carried in existing branches in Havana, Rio de Janeiro, Montevideo, Buenos Aires, Santiago de Chile, Manila, London, Madrid and Johannesburg. Exclusive distributing arrangements are maintained in Mexico, Venezuela, Porto Rico, Barbados, Peru, Colombia, Bolivia and India, where stocks are also carried.

New Advertising Literature

Compressor. — The Griscom-Russell Company, 90 West St., New York City, has issued bulletin No. 350, describing the "G-R Regenerative Compressor."

Portable Instruments.—The Westinghouse Electric and Manufacturing Company is distributing leaflet No. A3501, describing its type PX portable instruments for general testing purposes.

Insulating Fabric. — A non-woven fabric sheet and tape for insulating purposes, "Voltape," has been developed by the Res-Pro Industries, Inc., 209 Washington Street, Boston.

Indicators and Gages.—The Bacharach Industrial Instrument Company, Homewood Station, Pittsburgh, is distributing pamphlet M, covering its engine indicators (Maihak type). Bulletin G describes its "Easy Read" manometers and gages.

Pump Governor. — Having acquired sole rights to manufacture and sell Ideal Pump Governors the Atlas Valve Company, 282 South Street, Newark, N. J. is now distributing its first bulletin, No. 1-A, edition No. 1, describing this governor.

Combustion Recorder.—Mono Corporation of America, New York City, has issued a bulletin describing its "Duplex Mono," which simultaneously records on one diagram both the surplus of air in process of combustion and the degree of incomplete combustion.