

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

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Journal Raises Subscription Price to Earlier Figure

AFTER resisting for many months the pressure put upon it by the enormously increased prices of everything the ELECTRIC RAILWAY JOURNAL is forced to raise its subscription price, the increase taking effect with the March 1 issue. The increase will be but one-third, so that even at the \$4 rate the paper will still be supplied to its readers at a price lower than a number of other magazines in the same class have been forced to charge. Long-time readers of the paper will remember that they paid \$4 a year for the STREET RAILWAY JOURNAL up to March 1, 1904, even when it was a monthly. The same causes which have operated to make an increase in fare necessary for the electric railways have been potent in the publishing business. The elements of increased expense in both cases are materials and labor. Take for example the item of paper. White paper of the quality used in the JOURNAL has increased more than 50 per cent in cost in three years; printing costs are a third higher, and engraving expense has gone up 75 per cent. In war time and pre-war time the JOURNAL was sold at a very low price considering the cost of producing it. Its watchword has been "service to the industry," and this included keeping the paper within the reach of all who ought to receive it regularly, but there is a lower limit to the price at which it can be produced. This note of explanation is in no sense an apology for the decision to raise the subscription price. In going back to the former price of \$4 the publishers are still furnishing the paper at a price less than before the war in comparison to cost. If the paper is worth while at all, and the overwhelming testimony is that it is so, it is worth any reasonable price. A single idea derived from its columns in the course of a year will more than pay for the year's subscription.

Electric Railway Statistics Permit Interesting Comparisons

IN THIS ISSUE we publish the statistical tables of rolling stock ordered and track built during the past year. Similar tables have been an important feature of our first issue of each year since 1907. In the analysis of rolling stock, three things stand out above the others. The first is the increase in the number of one-man cars. These cars in 1918 amounted to more than six hundred and constituted 37 per cent of all the cars ordered for city service, exclusive of those for subway and elevated railway use. Nearly all of the one-man cars ordered were of the uniform length of 27 ft. 9½ in. The second noticeable feature is the increase in the number of trailers ordered for interurban operation. This increase was no doubt influenced by the difficulty experienced in obtaining equipment due to war conditions and by the adaptability of train operation to service where large numbers of passengers are loaded and unloaded at single points as at the war industry plants. The third point is the large decrease in the number of home-made cars, due also in part at least to the scarcity of material and labor. As was to be expected, the track statistics show very little new track built. Actually, if the rapid transit extensions in New York City are deducted, it will be found that only four city systems built more than 7 miles of track, and of these four, two were municipal lines. The interurban situation is no better. One publicly owned railway in Canada built 28 miles of track. The aggregate interurban mileage for the United States and the rest of Canada besides this line was only about 90 miles, made up principally of spurs and short extensions, including, of course, those in whose cost the government assisted. More mileage of steam lines was electrified than in 1917, but this was due to the progress made by the Chicago, Milwaukee & St. Paul Railway.

A Definite Program for Immediate Action

After summing up the electric railway situation, in his article in this issue, Philip H. Gadsden says this:

I believe that the financially strong electric railway property groups should get together and support with their money and their executive talent a permanent agency which could do a number of things for the industry as a whole.

It could assist individual railways in solving their local problems by bringing to bear upon these the experience of other railways similarly situated.

It could conduct general publicity campaigns on behalf of the industry generally.

It could demonstrate to public bodies the facts in any particular local situation by furnishing incontrovertible data applicable thereto.

It could do many other things to make itself well worth while.

It is my earnest hope that something of this sort will be done, and done soon and that men of wide experience will show a readiness to give of their time and energy to save the industry from annihilation and permit it to serve the country with first-class transportation.

Who Are to Run Our Cars?

ENTERING on a new calendar year we are also at the start of a period of reconstruction—a period which Judge Gary of the United States Steel Corporation predicts will be the most progressive, prosperous and successful in the country's history. This enormous work of reconstruction will undoubtedly demand the activity of every man and woman capable of taking part in the task. It will call for the organization of industry in such a way as to utilize to the full all of the available working forces of the country. There will be no place in the economic structure for any idle person—man or woman—rich or poor—who is physically able to perform useful service.

In this situation the electric railways are confronted with a problem which has frequently been mentioned in these columns and which grows all the more disturbing in view of recent developments. We have in mind the shortage in man-power for the operation of cars and the discouraging outlook for the employment of women substitutes because of certain recent rulings of the War Labor Board. The situation is best illustrated in Cleveland and Detroit, as told in two articles in the Dec. 21 issue of this paper. In the first-named city the company has been forbidden to hire more women conductors and directed to discharge those now in service before March 1. In Detroit the union has notified the company that no more women must be employed and that those now on the cars must be let out in the near future. This dispute is now pending before the War Labor Board.

The attitude of the Amalgamated Association toward women conductors has been hostile from the start, the alleged basis for this opposition being the claim that female employees were being introduced in order to reduce wages and to demoralize the unions. That this contention had no foundation is evident by the ready agreement of the companies to pay full union wages to the women conductors and to allow them to join the organization of the trainmen. In its latest pronouncement on the subject, the Amalgamated Association still contends that the position of conductor is not the place for a woman, although it says that when their employment in this capacity is necessary during the war they should be on the same basis as men as to pay, seniority and working conditions and should become members of the association.

In face of the continued shortage of suitable male employees for platform duty in many cities this attitude of organized labor—apparently sanctioned by the War Labor Board—offers a disheartening outlook for an industry which should be ready to meet the full requirements of the coming period of construction. Women have been employed as conductors on several properties in the United States as well as in foreign countries. We believe that experience has proved them adapted to the work; in fact, since the duties of a conductor have become primarily those of a cashier, as they have on most modern prepayment cars, may we not venture to say that women are better fitted for the place than men? All reports indicate that the average woman conductor is accurate, rapid, honest, courteous and enthusiastic in the performance of her duties. Several companies reported a decreasing list of accidents due to the greater

caution of these employees. The public is satisfied in every city where they have been used. In brief, the statements in general indicate that the women conductors have made good. In view of the past year's experience we believe that there is a field for the woman conductor—a field of course with limitations. The employment of these women at the time was a patriotic duty. The companies which rose to the occasion and kept hundreds of extra runs in operation when no suitable men were available should not be discouraged now by any action of the War Labor Board.

The year just closed has been a hard one also for electric railways in having to meet the terms of the War Labor Board in the various awards affecting wages and working conditions. Admitting the justification for a living wage for the workman, the rulings of this board, which advanced the remuneration of street car employees about 50 per cent without providing the means for meeting this added item of expense, proved a real hardship in every instance. Several recent receiverships are a warning of the results of such a policy, and unless conditions in the nature of increased revenue improve shortly the coming year will prove disastrous for many more of the properties concerned. The labor situation, to say the least, offers a gloomy outlook.

The B. R. T. Goes Into Receiver's Hands

THE inevitable has happened and the Brooklyn Rapid Transit Company has gone into the hands of a receiver. This financial collapse will be a source of special regret to electric railway men because the company has made many important contributions to the science of railroading and is recognized everywhere as a leader in economical and scientific operation. Nevertheless, it has been compelled to acknowledge defeat in its tremendous struggle against the odds of continually increasing expenses with a fixed fare.

The list of electric railways which have passed into receivership during 1918 is far larger, measured in number of companies, miles of single track or capitalization, than in any previous year, and other companies will follow soon unless remedial steps are taken. It is significant that in New York State two of the three largest electric railway properties, those in Brooklyn and Buffalo, have confessed insolvency, and the president of the third among the large railway systems, the Interborough Rapid Transit Company, warns its partner in the dual subway agreement, the city of New York, that it too is in danger of being starved into bankruptcy unless remedial measures are begun promptly.

There is but one answer to the New York situation. The present Legislature should promptly grant power to the present public service commissions, or to their successors if new commissions are to be chosen, to permit the companies to charge an adequate fare. The city authorities should co-operate where they have power to do so and have not exercised it.

This is not only the counsel of justice but of expediency. Electric railway service is a public necessity and its cost must be met. The conditions under which these companies suffer are not local but general. Relief, and given quickly, is the best as well as the only fair course possible.

The Prospects for 1919 Surveyed

IS THE débâcle at hand for the electric railway industry in the United States? Is the year 1919 to witness a series of financial disasters in this great class of public utilities? We hope our next annual Statistical Number will not have to record such a story of cataclysm, yet we do not hesitate to predict that the financial record of the coming twelve months will include many an item of bankruptcy for these properties unless prompt and sufficient means are devised for meeting their dire need of additional revenue. We have just discussed the situation in New York City. That in the country at large is not greatly different.

Last August the War Labor Board handed down a batch of awards fixing new wage scales for electric railways whose employees had appealed to this tribunal for the means of meeting the increased cost of living. The new wages were generous but not out of proportion to the rates paid at that time to other labor. The difficulty in the situation, however, was that most of the companies affected had not the resources with which to meet the added expenses. The members of the board appreciated the dilemma in which the companies were placed, but they could do nothing except call attention to the situation and make recommendations for relief by federal or local authorities.

Except in a few instances, the public has not shown a disposition to measure up to the standard of fair dealing which the board set before them. In some cases state utilities commissions or municipal authorities have extended a helping hand to the suffering transportation agencies, but this aid has rarely been sufficient to give adequate relief. In a greater number of cases the authorities have either refused an increase in fares or are withholding action while creditors knock at the doors of the distressed companies. Meanwhile service suffers and these utilities are unable to do their share in the great period of reconstruction which is at hand.

The threatening outlook can be no better pictured than by noting the experience of the Chicago City Railway, which recently passed its dividends for the first time since dividends were initiated in 1870. This is one of the two main properties, and the most prosperous, of those composing the Chicago Surface Lines. The regular quarterly distribution was omitted because the company not only is failing to earn anything for the stock, but is not earning 5 per cent on the city purchase price. President Busby explained that this action was caused by the wage increase ordered by the War Labor Board, the increased cost of supplies and the falling off in gross receipts due to a decrease in traffic. The Surface Lines petition for a 7-cent fare has been pending before the State commission for several weeks and the frequently delayed hearings prompted one of the attorneys to state that another of the component companies faces serious financial troubles if it cannot meet its bond interest on Feb. 1.

The Boston Elevated situation is only less alarming because its failure to produce adequate revenue through earnings is offset by the guarantee of dividends through the State taxing power. This case, however, is an unusual illustration of the effect of fare increases on traffic. Under public trustee operation, with the power to alter fares to meet the cost of service, fares were

advanced last August from a 5 to a 7-cent basis. Passenger revenue for the first month increased about 24 per cent. For the second month it showed a gain of 12 per cent, while for the third month—due largely to the effect of the influenza scare—the gain was only 1 per cent instead of the possible 40 per cent under the new rate. On Dec. 1 the fare was raised to 8 cents, but on account of the resulting traffic losses the increase in revenue was so small as to be ridiculous. It has been stated that a 10-cent fare would pay the Boston Elevated bill provided everybody who used the cars last year at 5 cents would be compelled to ride this year and pay 10 cents.

This brings us to the critical question being asked by railroad men all over the country, namely, "What system of fares will enable us to get out of our difficulties?" Some companies have gone from a 5 to a 6-cent basis and instead of the theoretical increase of 20 per cent in revenue, the reports show anywhere from 8 to 14 per cent. Others having tried a 7-cent fare, with the possibility of a 40 per cent gain, report gains from 1 to 24 per cent. A few have been collecting 8 cents, and instead of the theoretical gain of 60 per cent in earnings they show from 9 to 14 per cent. Ten-cent fares have been tried elsewhere, and it is possible that some companies will experiment with rates even higher.

The receiver of the Bay State system stated recently that this constant irritation of the public by little jabs at the problem is responsible for a large part of the railway troubles. He favored a jump to a rate considerably higher so that changes hereafter will be in the direction of lower fares. There are other thoughtful operators who expect to find eventual relief only in a zone system of fares. Still another group are coming to agree with the view recently expressed in the Bay State fare case that "it is wiser to place a part of the burden of the cost of necessary electric railway service directly upon the community as a whole than to suffer increases in fare which do not produce the results that they are designed to produce, and which are seriously disturbing to social and economic conditions."

The concentration of trained minds on this problem is bound to find a solution in time. A solution will be found because electric railways are essential to the national life and someone must pay for their continuance. Further receiverships may be required to awake the public and the authorities to the danger, but it will be unfortunate indeed if such a price has to be paid to attain justice. The subject is receiving much publicity, and the public we think realizes, as never before, that early action is necessary. What that action might be is suggested in the extended article in this week's issue by L. R. Nash of Stone & Webster, who reviews at length the principal service-at-cost franchises in existence or proposed. The Merchants' Association in New York has appointed a committee to report on the subject and similar action will be taken by the United States Chamber of Commerce. We have no doubt that through the work which is being done in and outside the industry the long dormant sense of fairness in the mind of the prejudiced public will be roused and the utilities which have been crowded to the brink of disaster will be saved. We confidently believe that the year 1919 will bring the dawn of an era of understanding and fair dealing.

Cohesive Spirit of Electric Railway Industry Must Be Conserved and Intensified

Results of Activities of Temporary War-Time Organization Will Be Partly Lost Unless Effort Is Made to Capitalize and Stabilize Them—A Number of Very Definite Utility Problems of a National Character Await Solution

By PHILIP H. GADSDEN

Chairman Readjustment and National Relations Committees,
American Electric Railway Association

THE publication of the annual review issue of the ELECTRIC RAILWAY JOURNAL renders especially timely a retrospective view of the condition of the transportation utility during the past year under war conditions. But such a retrospect is warranted only if it furnishes help for the future. The American Electric Railway Association has appointed a committee on readjustment, the purpose of which is to assist electric railways in tidying over the period on which we are now entering. Before it has finished its work this committee will presumably have definite recommendations to offer with reference to some permanent way of conserving the gains in co-operative spirit which have been made during the war period. Otherwise the sacrifices and concessions made will largely have been in vain. And this matter must be considered not alone in the light of the needs of this one industry, but rather of the needs of public utilities as a whole. An industry representing a capitalization of ten billion dollars, and involving the welfare of hundreds of thousands of stockholders and bondholders and the comfort and convenience of many millions of citizens must speak as one voice for the principles of fair dealing and justice for which the great war has been fought and won.

RECONSTRUCTION IS IN THE AIR

The emergency conditions of the war are passing, but they have not yet passed and will probably not disappear entirely for many months. Coal prices are dropping, materials prices will follow, labor conditions arising out of the war will be slow of readjustment, the revenue bill is still in controversy and public ownership is open for national discussion. Furthermore, the reconstruction or adjustment programs of many civic and governmental bodies are just beginning to be shaped. As a step in this direction, the Zihlman bill, offered in the House of Representatives on Dec. 12, provides for a "reconstruction commission" of ten members to study post-war conditions, recommend principles of uniform legislation for all states and consider



PHILIP H. GADSDEN

Mr. Gadsden has done notable work for public utilities generally, and for the electric railway in particular, during and before his time of residence at Washington as local representative of the Electric Railway War Board. Mr. Gadsden is president of the Charleston (S. C.) Consolidated Railway & Lighting Company. He was educated in the Charleston schools and at the University of South Carolina, from which he holds the degree LL.D. He practiced at the bar for fifteen years and also served for six years in the State legislature.

the problems of labor, capital, credit, public utilities and other matters.

But before going into details regarding reconstruction let us note for a moment the present situation which confronts us. The electric railway industry, due to conditions brought about by the war, is practically bankrupt. It has been subjected not only to the general rising costs of materials but also to the particularly burdensome labor awards of the National War Labor Board. Its needs, as brought to the attention of the federal authorities a year ago, have not brought forth remedial action of a general character. As a result, the electric railways, with few exceptions, find themselves at the close of the war with ruined credit and deteriorated equipment, unable to give adequate service, and in many communities, objects of hostile and unreasoning criticism.

The facts and figures presented by the writer at the war emergency and reconstruction congress of the United States Chamber of Commerce as reported in the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 14, 1918,

page 1045, indicate very clearly the problems that must be solved. Whether they shall be solved by the politicians and reformers or by the industry depends upon whether a defensive or an aggressive policy is adopted by the operators of the electric railways. Furthermore, the manner in which the electric railway problem is handled will, in a very large measure, determine how the problems of other public utilities are to be handled as they arise.

THESE ARE THE BOLD FACTS TO BE CONSIDERED

Briefly, then, the rehabilitation of the industry must be undertaken aggressively, with a recognition of the following facts:

1. As an industry, the electric railway industry is practically bankrupt.
2. Its service is essential to the health, progress and development of every community, hence to the nation itself.
3. The present rate structure is economically unsound, and the present basis insufficient to take care of

increased wages and standards, together with the higher scale of material costs likely to continue for many months.

4. The public authorities, whether state public service commissions or municipal bodies, must be made parties to the readjustment on a co-operative rather than an antagonistic basis.

8. Adequate and satisfactory service to the public is the primary end in view.

The war has taught the industry that the local franchise relationship is inelastic and non-responsive to the economic laws upon which all industry must be founded. It has shown that irretrievable loss is in practically all cases made a condition precedent to the granting of rates that will provide an adequate return. Such irretrievable loss means poor service and public dissatisfaction, hence adequate service and public satisfaction must be insured by some form of public responsibility in the revenues necessary for maintaining such service.

Whether the public's financial responsibility can be worked out through a readjustment of present rate structures and service schedules, or whether the funds necessary shall be furnished from the public treasury, is in a sense a collateral question, as long as the importance of electric railway development as essential to the nation's life and progress is regarded as the prime consideration.

SOME DEFINITE PROBLEMS FOR SOLUTION

The problems for the industry to solve may be considered briefly as follows:

1. It must learn how to conduct an educational campaign which will give the public a point of view from which it will be able to deal with the railways on an equitable and therefore fair basis. In this connection data must be widely distributed so that the public will obtain a proper concept of the costs of building, equipping and operating electric roads, and the utilities must virtually be opened through advertising channels for public inspection. Further, the railways must suggest such inferences from present conditions as to stimulate public thought on the railway question, with special emphasis upon the idea of public interest.

2. The problem of public ownership versus service at cost must be attacked.

3. Due consideration must be given to the merits of quasi-public ownership as compared with the service-at-cost plan.

4. Franchise relationships must be studied.

5. The industry must investigate the extension of state commission jurisdiction under proper laws, particularly with relation to responsibility for financial and service conditions.

In connection with the latter requirement it is interesting to note that during the war the National Committee on Public Utility Conditions investigated the rate situation as affecting the electric railways for the first six months of 1918. During that period 236 rate increases were allowed electric railways by state commissions, whereas during the same period only eighteen were allowed by municipal authorities. It was also shown that in twenty-two states electric railway rates are subject to regulation by municipal authorities. A number of important states in which public service commissions exist fall into this group because of the

action of the supreme courts of those states in depriving the commissions of jurisdiction over rates fixed by local franchise.

MANY RECONSTRUCTION FORCES ARE AT WORK

The working out of any such program as herein outlined is not to be confined to any one committee but is to be made a part of the general reconstruction program of the nation. Already reconstruction committees have been organized and relationships established between those committees and the readjustment committee of the American Electric Railway Association. Among these reconstruction committees should be mentioned the following:

1. The special war committee of the National Association of Railway and Utilities Commissioners which is to be continued as a reconstruction committee in Washington, D. C. Its program is a study of the entire problem of public regulation of railroads and public utilities. Among the points for consideration mentioned by the president of the association in his address at its recent convention was this: "Perhaps the time has come for our association to consider the advisability of recommending a change in the contract relationship of these utilities." This statement referred especially to electric railways and their embarrassment during the war by the restrictions imposed by local franchises. Continuing the president said: "One of the methods suggested is that state laws or constitutions be so modified as to give all state commissions jurisdiction over rates of utilities, and that an indeterminate permit free from all local limitation as to rates be issued upon the surrender of the existing license or franchise."

In the report of the committee on public utility rates, presented at the convention, it was suggested under "Electric Rates" that an automatic sliding scale might be desirable, based upon fluctuating costs of material and labor where the state commissions have adopted uniform cost accounting for public utilities. Under "Street Railway Rates" the report states "among utilities most seriously affected by war conditions because of increased cost of fuel, material and labor, are the street railways. It is believed that when it is possible to do so, the zone system offers the most practical method whereby increased income may be obtained. Where zones are already established, an increase in number of zones or a shortening of the zones will usually yield the increased revenue desired." Many other important statements are made with reference to the rates of other utilities. These are some of the problems that will be considered by the reconstruction committee.

2. Reconstruction committee of the National Civic Federation. This committee has listed public utilities among the subjects to be studied, and the thoroughness with which the federation makes its investigations is well known to those familiar with its work.

3. Special committee of the Merchants' Association of New York. This committee is to study and report upon the question of governmental ownership and operation of public utilities and industrial undertakings. A note regarding it and giving its membership will be found in the issue of the *ELECTRIC RAILWAY JOURNAL* for Dec. 14, 1918, page 1063.

4. A committee of the United States Chamber of Commerce, provided for in the following resolution

adopted by the recent War Emergency and Reconstruction Congress:

Public utilities have faced difficult problems, which have been accentuated by conditions arising out of war. The development and efficiency of such a utility as local transportation has immediate importance for every community. It is recommended that the Chamber of Commerce of the United States should appoint a committee to investigate and study the question of local transportation as it relates to the control of rates and service, franchises, taxes, the attraction of capital into the business, and such other questions as the committee may find pertinent. Such a committee should report its recommendations to the board of directors of the national chamber, and the board should deal with them in accordance with the established procedure of the chamber.

5. A special committee of the United States Chamber of Commerce to be made up of the representatives of industry and the chairmen of the war service committees, represented at the recent Reconstruction Congress. It will include the chairmen of the public utility war service committees that have been organized during the war. Thus, the public utility industry will have representation on this special committee in any work that is undertaken.

6. The readjustment committee of the American Electric Railway Association, to which reference has already been made. In addition to these six reconstruction committees and the bill now before Congress providing for the appointment of a federal reconstruction commission, there should be mentioned the various organizations that are likely to be appointed for the readjustment period, growing out of the activities of the War Finance Corporation, the National War Labor Board, the War Labor Policies Board, the Capital Issues Committee, the War Industries Board and the Council of National Defense.

Furthermore, it is probable that a committee on reconstruction finances will be appointed by the Investment Bankers Association of America, to co-operate with the other committees in relation to financial problems confronting the public utility industry.

In addition to the above, conventions of local public utility associations will be called for the consideration of reconstruction problems. Such a step has already been taken by the Illinois Electric Railways Association, which the writer hopes to be able to address on the occasion of the meeting to be held in Chicago on Jan. 17.

While a wide influence can be exerted through the activities of the above organizations, if properly guided and informed by a central committee, much additional work can be done through the various civic bodies and associations in the various states.

RECONSTRUCTION PLANS MUST BE MADE DEFINITE

One of the chief problems now presented to the electric railway industry is to determine promptly upon the fundamental points that should be urged before these various reconstruction committees and other bodies for consideration. The reconstruction committee of the American Electric Railway Association has

already considered a few of the points that should be referred to the special committee on electric railway transportation of the United States Chamber of Commerce. The points suggested for reference to that committee are as follows:

1. A study of the various classes of electric railway franchises, the unusual as well as the usual forms, with a digest of the same, indicating the burdens and requirements imposed upon electric railways, including paving requirements, free transfers, free carriage of certain classes of passengers, compulsory extensions into unproductive territory, etc. Some estimate of the total amount expended by the industry annually on account of paving requirements should be included.

2. The various forms of taxation to which electric railways are subjected, including city, county, state, federal, ad valorem, franchise and gross income taxes.

3. A formulation of some plan looking to the standardization of burdens and requirements and a segregation of the industry for purposes of taxation.

3. Service-at-cost plans, as compared with out-and-out municipal ownership, indicating the advantages of quasi-public interest service and finances.

5. Comparison of results of state commission regulation with regulation through municipal bodies.

6. Uniform state commission laws or a standard franchise.

THE war has taught the industry that the local franchise relationship is inelastic and non-responsive to the economic laws upon which all industry must be founded. It has shown that irretrievable loss is in practically all cases made a condition precedent to the granting of rates that will provide an adequate return. Such irretrievable loss means poor service and public dissatisfaction.

So much for a general program on reconstruction. Next, how is even a satisfactory program to be made effective?

A STRONG CENTRAL AGENCY IS NEEDED

Unless some agency which is financially strong can be set up to put the plan into operation the whole matter will be in danger of resolving itself into a mere academic discussion—reports, resolutions, compliments, but nothing more. I believe that the financially strong electric railway property groups should get together and support with their money and their executive talent a permanent agency which can do a number of things for the industry as a whole, among which I need mention only the following:

1. It could assist individual railways in solving their local problems by bringing to bear upon these the experience of other railways similarly situated.

2. It could conduct general publicity campaigns on behalf of the industry generally.

3. It could demonstrate to public bodies the facts in any particular local situation by furnishing incontrovertible data applicable thereto.

This influential central agency could do many other things to make itself well worth while. It is my earnest hope that something of the sort suggested will be done, and done soon and that men of broad practical knowledge and wide experience will show a readiness to give of their time and energy to save the industry from annihilation and permit it to serve the country with first-class transportation.

Transportation Work of the United States Housing Corporation

Under the Supervision of the Transportation Division
300 or More Cars Have Been Purchased and Much
Work Undertaken to Facilitate Housing of War Workers

BY GARDNER F. WELLS

Manager Division of Transportation, United States Housing Corporation

AFTER the United States had been at war with the central powers for some months it became apparent to the government officials that they were being seriously hampered in the task of supplying the munitions of war by the lack of housing facilities for workers in the vicinity of war manufacturing plants. The same conditions surrounded the production of merchant ships also, but fortunately the United States Shipping Board was supplied with the funds necessary for solving the housing problem as soon as the circumstances were appreciated and the necessary legislation to enable the funds to be applied to housing and transportation could be passed. No such provision could be made for the workers in munitions plants until Congress should take special action to provide funds for this purpose, together with an organization to dispense these funds effectively. This was done in the spring of 1918 and on May 16, 1918, an act was passed to authorize the President to provide for housing needs. The President signed the bill on June 26 and the work was delegated by him to the Secretary of Labor, who instituted the Bureau of Industrial Housing and Transportation. Of this bureau Otto M. Eidlitz was made director. To facilitate the administration of the work the United States Housing Corporation was incorporated on July 8 with Mr. Eidlitz as president, and funds became available on July 25. As a part of the activities of the corporation a transportation division was organized and the writer was made its manager.

WHY THE TRANSPORTATION DIVISION WAS CREATED

This transportation division was organized for the purpose of improving present, and creating new, transportation facilities for war industrial workers, in accordance with the act of Congress already mentioned. Among other things this act anticipated that in certain localities it would be found that transportation would solve the housing problem. This could be brought about by making communities where there were vacant houses



GARDNER F. WELLS

Mr. Wells was associated with Stone & Webster, Boston, for fifteen years until March, 1915, when he took up his present work as head of the corporation bond buying department of Arthur Perry & Company, Boston. After leaving the Massachusetts Institute of Technology he spent ten years with the Thomson-Houston and General Electric Companies in engineering construction and management work, and followed the same general line with Stone & Webster. He was commissioned major in the Army Ordnance Department in 1917, on leave of absence from his firm, but resigned to take up his present work with the Housing Corporation.

in abundance available to employees in congested industrial centers through improved transportation facilities. It was also anticipated that improvements to local transportation systems in communities where intensive war manufacturing was being carried on would materially add to the speeding up of the work.

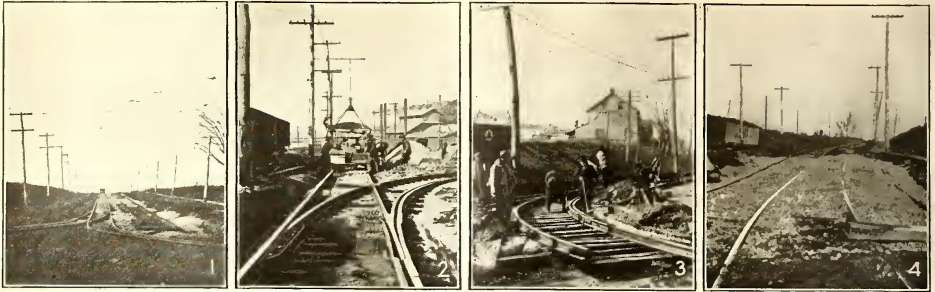
That transportation supervision might properly be administered, ample provisions were made in the act for equipping, managing, maintaining, purchasing, leasing, constructing, requisitioning or acquiring by condemnation such transportation lines as might be necessary to provide adequate transportation facilities for industrial employees engaged in war work. This act also carried with it the appropriation of certain funds for the beginning of this work. Subsequent acts have further increased the funds available.

Many special requests for assistance have come to this division from railway companies or manufacturers, but a strict interpretation of the act of Congress indicated that the work to be handled by the division was to be considered from the standpoint of

war necessity. The work was therefore confined principally to requests coming from the War and Navy Departments.

The transportation division consists of manager, assistant manager, consulting engineer, three investigating engineers, one construction engineer, a division manager at New York City, as well as an office manager and two investigating engineers, one consulting engineer and two assistants at Chicago, a consulting engineer at Philadelphia, one construction engineer at Erie and one division manager and two construction engineers at Hampton Roads, together with the necessary clerical assistants in the several offices.

The principal work of the division has covered: (1) The installation of special steam and electric train service for war workers. (2) The rearrangement of steam and electric railway schedules. (3) The financing of necessary electric railway extensions and additions. (4) Construction or supervision of construction of these extensions or additions.



TRACK CONSTRUCTION WORK AT BETHLEHEM, PA.

Fig. 1—Looking west on Broad Street from Minsi Trail Street. Fig. 2—East leg of wye, Day Avenue. Fig. 3—West leg of wye. Fig. 4—Looking north on Minsi Trail Street, from Market Street to Broad Street.

Through the efforts of the division, twenty-one special steam trains, to provide transportation for war workers, have been installed in various parts of the country. The Railroad Administration has established an especially low tariff for these workers, and in many instances the Housing Corporation has granted still lower rates, absorbing the incidental differentials. By this arrangement a large amount of vacant housing has been made available. At least 8000 people have been cared for in this manner at a cost which will not be more than \$275,000 to the division, based on this service being in operation for one year. This is at the rate of approximately \$35 per man per year.

The experience of the Housing Corporation shows that the average cost of housing a war worker in a dormitory completely equipped and furnished with cafeteria, etc., is \$550, while the cost of housing workers in homes built especially for them is from \$3,500 to \$5,500 per house, the assumption being that the average number of workers occupying each house will be two. On this basis it will readily be seen that, through transportation improvements, millions of dollars of investment have been saved.

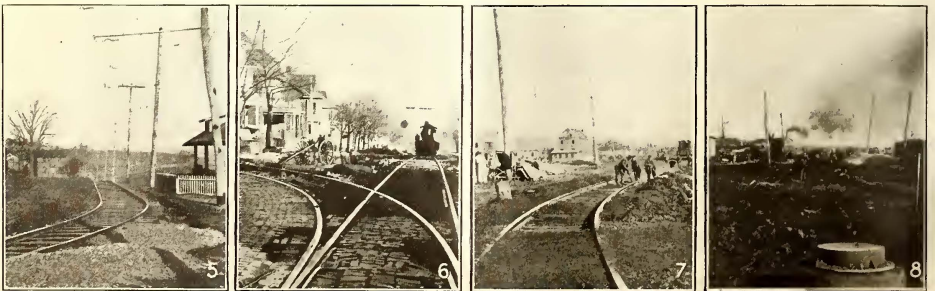
In accordance with recommendations made to the regional directors of the railroads under federal control, and through the co-operation of the United States Railroad Administration itself, war workers have been benefited in many localities by rearrangement of schedules and institution of extra stops on steam railways, and by rearranging schedules on electric railways.

In many instances it was reported by either the War or the Navy Department that electric railway service in connection with war industries was entirely inadequate. In every such case a careful investigation and study of conditions was conducted, recommendations were made and estimates of cost were compiled for necessary improvements.

THE HOUSING CORPORATION PROVIDES THE FUNDS

When it was determined that new and additional transportation facilities were required, plans or recommendations therefor were presented to the companies with the request that measures be taken immediately to acquire or install the necessary extensions, additions or betterments. These recommendations usually involved an expenditure for their accomplishment. In all cases the companies pleaded that they were unable to finance the cost of the work at a reasonable rate of interest. They also objected to making expenditures at the time because of the abnormal costs of labor and material and the fact that the operation of these extensions and additions was unprofitable. It was also held by them that the service was for rush hours only and that these periods were the most costly to operate. In spite of the foregoing, however, they invariably agreed, from patriotic motives, to carry out the Housing Corporation's recommendations, with its assistance and under its supervision.

When it was decided what improvements should be carried out, contracts were entered into with the local



TYPICAL TRACK JOBS AT BETHLEHEM, PA.

Fig. 5—Looking north on Minsi Trail Street from Broad Street. Fig. 6—Looking east on Broad Street from Linden Street. Fig. 7—Looking northeast on Newton Avenue. Fig. 8—Looking northeast on Newton Avenue from Road No. 1.

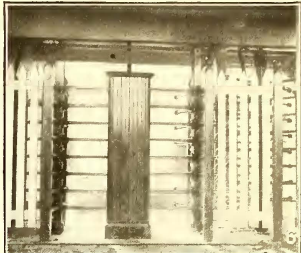
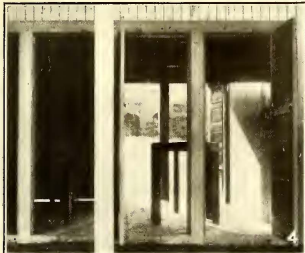
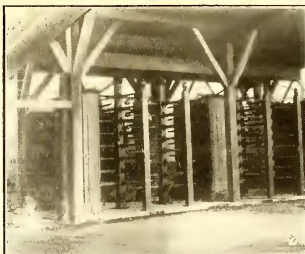
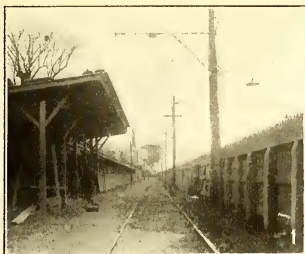


Fig. 1—Prepayment area at Watertown Arsenal.

Fig. 2—Turnstiles at exit.

Fig. 3—General view of entrance-exit structure.

Fig. 4—One of the prepayment entrances.

Fig. 5—Another general view of the entrance-exit arrangement.

Fig. 6—Close-up view of a turnstile.

Fig. 7 — Bridge Street, southwest of Milnor Street, Philadelphia, near Frankford Arsenal.

Views showing construction work at federal arsenals in Boston and Philadelphia done under supervision of the transportation division of the United States Housing Corporation. Figs. 1 to 6, Watertown Arsenal, Boston; Figs. 7 to 12, Frankford Arsenal, Philadelphia.

Fig. 8 — Bridge Street north of Frankford Creek—arsenal buildings in background.

Fig. 9—Bridge Street looking northwest from Thompson Street.

Fig. 10 — Bridge Street looking northwest from Milnor Street—arsenal gate at right.

Fig. 11—Pratt Street looking northwest from Richmond Street.

Fig. 12 — Same looking northwest from Salmon Street.

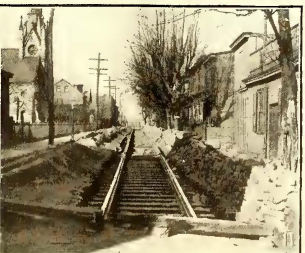
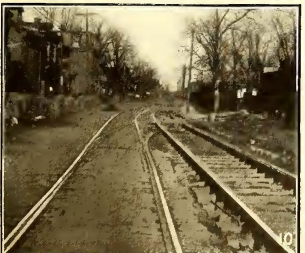
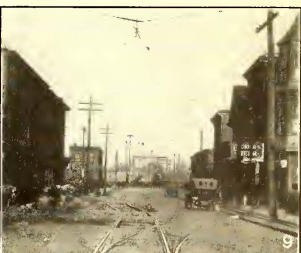
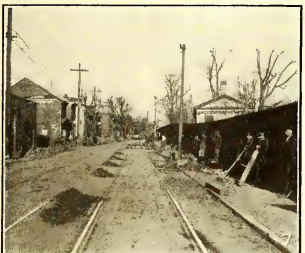


TABLE I—STATUS OF LOANS AND PROPOSED LOANS
AS OF DEC. 17, 1918

Locality	Name of Company	Contract Executed for Loan	Loans Recommended in Reports	Allotment Annulled
Bethlehem, Pa.	Lehigh Valley Transit Co.	\$650,000		
Bridgeport, Conn.	The Connecticut Co.	1,530,000		
Boston District.				\$462,000
Boston-Watertown	Boston Elevated Ry.	38,000		
Buffalo, City of				500,000
Buffalo-Niagara.	Buffalo & Depew Ry.	74,000		
Buffalo-Depew.				500,000
Charleston, S. C.				
Chicago, Ill.	Chicago City Ry.	235,000		
Dayton, Ohio.				500,000
Erie, Pa.				100,000
Gary, Ind.	Gary & Valparaiso Ry.	33,000		
Gary, Ind.	Gary Street Ry.	169,000		
Hammond, Ind.	Hammond, Whiting & East Chicago Ry.	315,000		
Hegewisch, Ill.	Calumet & South Chicago Ry.	150,000		
Hilton, Va.	Newport News & Hampton Ry. Gas & Electric Co.	\$150,000		
Milton, Pa.	Lewisburg, Milton & Watsonstown Passenger Ry.	25,000	\$655,000	
Neville Island, Pa.		25,600		2,700,000
Newark District.	Jersey Central Traction Co.		67,000	
Newcastle, Del.				100,000
Niles, Ohio.				300,000
Norfolk District.				1,700,000
Norfolk, Va.	Virginia Ry & Power Co.	300,000		
Pensacola, Fla.				100,000
Philadelphia District.				456,000
Philadelphia, Pa.	Philadelphia Rapid Transit Co.	2,284,000		
Rock Island, Ill.	United Light & Ry. Co.	105,000		
Seven Pines, Va.	Richmond - Seven Pines Ry.	\$118,147		
Toledo, Ohio.				500,000
Tulleytown, Pa.				150,000
Washington, D. C.	Washington Ry. & Elec. Co.		125,000	475,000
Washington, D. C.				400,000
TOTALS		\$6,021,747	\$257,000	\$8,743,000
SUMMARY: Contracts executed		\$6,021,747		
Loans recommended			257,000	
Allotments annulled				8,743,000
Total			\$15,021,747	

*Purchase by Housing Corporation.

transportation companies whereby the Housing Corporation financed the undertaking on a 5 per cent interest basis. In most instances the government is to bear the excess war cost, this to be determined in the following manner.

An appraisal of the additions and extensions to the properties is to be made on a date fixed by the Housing Corporation within a period of from one to three years after the declaration of peace, to determine their then cost to reproduce new. The difference between this appraisal and the actual cost of the work is termed the war excess cost, and this difference is to be borne by the government. Where funds have been advanced, the companies have been required to furnish proper security by lien, mortgage or pledging of securities, or guaranty of another and responsible corporation. The amount as determined by the appraisers is in substantially all cases to be returned to the government in five equal annual installments, payment of the first installment being due one year after the date of the appraisal.

In accordance with the above arrangement the government, through the Housing Corporation, has contracted to advance about \$6,000,000 to various traction companies. The total appropriations for the transportation division originally amounted to \$15,000,000. As soon as the armistice was signed, the amount was cut down to approximately \$6,500,000. There may be a further reduction due to the omission of some of the

work planned. A general summary of the division's expenditures is as follows:

Executed contracts with electric railways	\$6,021,747
Loans with electric railways recommended	257,000
For operating steam trains	137,500
Transportation division administration expenses and overhead (six months)	30,000
Total	\$6,446,247

The first loan executed was with the Connecticut Company, on July 31, and the last was with the Philadelphia Rapid Transit Company on Nov. 8, the total period covered, therefore, being about three and one-half months. One road was purchased, the Richmond-Seven Pines Railway, for the sum of \$118,147.

FINDING CARS FOR ELECTRIC RAILWAY NEEDS

Naturally the primary need of the electric railways serving war plants was for cars, and the division promptly made arrangements to supply a considerable number, totaling to date more than 300. Most of these were new cars of the local companies' standard types. New double-truck cars to the numbers indicated were purchased for the following: Lehigh Valley Transit Company, fifteen; Connecticut Company, fifty; Gary & Valparaiso Railway and Gary Street Railway, twelve; Hammond, Whiting & East Chicago Railway, ten; Lewisburg, Milton & Watsonstown Passenger Railway, three; Newport News & Hampton Railway, Gas & Electric Company, ten; Philadelphia Rapid Transit Company, 110. Twenty one-man cars were also purchased for the Connecticut Company and fifty for the Virginia Railway & Power Company for use at Norfolk. Some second-hand cars (eight motors and four trailers) were supplied to the Buffalo & Depew Railway; three to the Jersey Central Traction Company, and eight old Interborough Rapid Transit Company cars to the Virginia Railway & Power Company. The one-man cars mentioned were of the standard Birney type, and two of the Gary cars were of the double-end Peter Witt type, nearly like the Housing corporation's proposed "standard" car.

The "standard" type, of which the corporation but for the signing of the armistice would have ordered fifty at once, was developed to simplify the matter of ordering double-truck cars and to render the cars salable after the war in case the local companies should prove to have no further use for them. At the request of the Housing Corporation the War Board of the American Electric Railway Association appointed a committee to consider plans for a design of car which would be adapted to the corporation's needs. As a result the committee approved for the purposes outlined two types of double-truck car, as described in the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 26, 1918, page 729. Special credit is due to C. O. Birney of Stone & Webster, Boston, Mass., for his work in preparing plans for the consideration of the above-mentioned committee.

TRACK EXTENSIONS WERE ALSO A FEATURE OF THE DIVISION'S ACTIVITIES

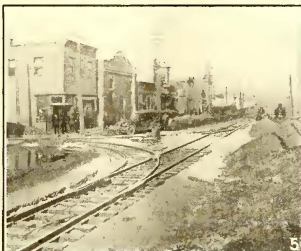
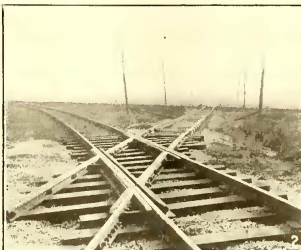
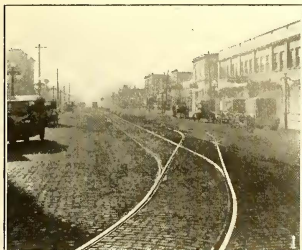
In addition to the provision of rolling stock the Housing Corporation financed many track improvements, and in more than one case assisted in increasing power facilities. A notable example of this work is furnished by the Plaza "dumb-bell" loop at Bridgeport, Conn., an

improvement to facilitate loading and routing of the cars in that important munitions center. Other extensions and rearrangements in Bridgeport bring the total expense at that point to about \$1,333,000. At Boston, Mass., a loop and prepayment station for the Watertown arsenal involved an expenditure of about \$40,000.

A very large proposition was a double-track extension of the Chicago (Ill.) City Railway to serve the United States Quartermaster Depot. This extension is a mile in length, is located on Thirty-ninth Street between Ashland and Western Avenues, and cost about \$230,000. In the same city \$150,000 was spent for nearly 12,000 ft. of single-track equivalent for the Calumet & Chicago Railway to benefit employees of the Pressed Steel

the Navy and War Departments, the United States Railroad Administration, the Emergency Fleet Corporation, and other governmental agencies and to the American Electric Railway Association War Board. Special credit is due to Mr. Eidlitz, president of the corporation, and to J. P. Clark and A. L. Drum, consulting engineers to the division. Mr. Eidlitz has been in the closest possible touch with the Department of Labor, under the auspices of which the corporation has operated. Messrs. Clark and Drum have personally investigated in the field the propositions made by the electric railways and have furnished sound engineering counsel in connection therewith.

The General Electric Company, the Westinghouse Electric & Manufacturing Company, Stone & Webster



TRACK CONSTRUCTION IN CHICAGO

Fig. 1—Forsyth Avenue, looking south from Chicago Avenue, showing double-track, the second track having been installed to facilitate movement of cars at a very heavy loading point.

Fig. 2—Hegewisch extension, on Brandon Avenue, looking south from steam railroad crossing. Double-track begins where car is seen.

Fig. 3—Hohman Street, looking south from point near N. Y. C. & E. R. track, showing second track installed to complete double-track line to Chicago.

Fig. 4—Hegewisch extension, on Brandon Avenue, looking north from Brainerd Avenue (end of line) at Pressed Street Car Works.

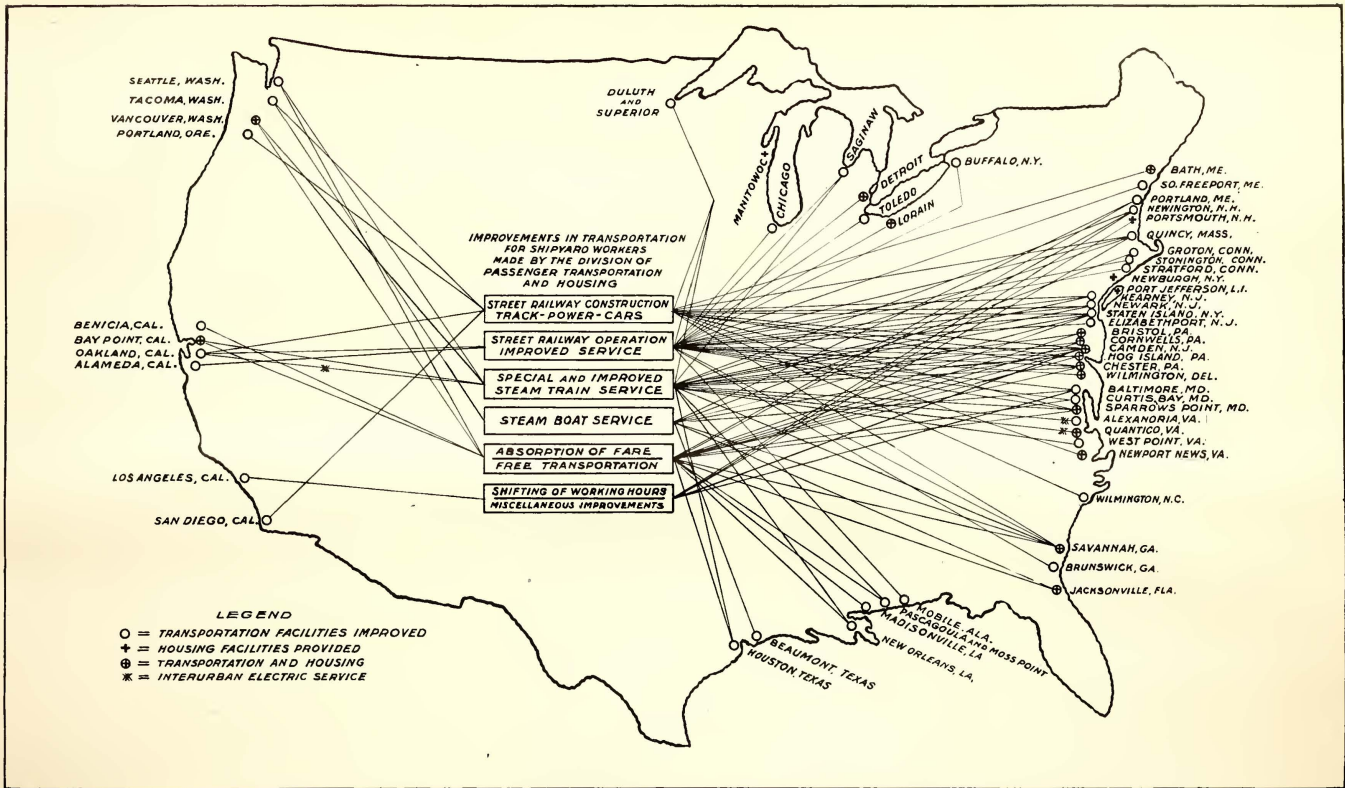
Fig. 5—Columbia Avenue, Winton Avenue and Chicago Avenue, looking north from former stub terminal at Standard Steel Works. Near point where connection is made with Gary Street Railway.

Fig. 6—Hegewisch extension, on Brainerd Avenue, looking south from about 125th Street and showing construction through marsh.

Car Company and the Ryan Car Company. One of the largest single jobs was at Philadelphia where, besides the large number of cars supplied, additional substation and feeder capacity was furnished as well as storage tracks, etc., all to accommodate the workers at the League Island Navy Yard. These improvements cost more than \$1,000,000. Similar work in the Eddystone district cost nearly \$600,000, and more than \$500,000 was spent on extensions, a rotary substation, direct-current feeders, a terminal loop, etc., at the Frankford Arsenal. These examples are cited merely to show how diverse has been the task of the transportation division and how wide the territory over which its work has been spread.

In concluding this brief summary of our work I take the opportunity to record the appreciation of the division for the splendid co-operation it has enjoyed from

and other commercial concerns have rendered invaluable aid. E. S. Harkness, of the Standard Oil Company, assisted very materially in connection with transportation matters. On the division staff at Washington the manager has been ably assisted by W. A. Mellen, formerly associated with the Capital Traction Company; H. H. Easterly, associated with Mr. Drum; Cabot Stevens, of Stone & Webster; Edward P. Smith, formerly with Harris, Forbes & Company; G. W. Wells, formerly with Stone & Webster; and H. A. Nicholl, general manager Union Traction Company of Indiana. Mr. Smith's financial advice in connection with the making of loans was greatly appreciated. Mr. Nicholl was in charge of the Hampton Roads district. The division also extends its thanks to its loyal office staff for the way in which it assisted in the work done during the past few months.



Map of the United States Showing the Points at Which Improvements for Shipbuilding Workers Have Been Made by the Division of Passenger Transportation and Housing, U. S. Shipping Board, Emergency Fleet Corporation

Electric Railways Help Win the War

How Electric Cars Were Purchased, Electric Roads Extended, Steamboats and Railroad Trains Put in Service and Houses Erected During the War to Stimulate Production at Our Shipyards

By A. MERRITT TAYLOR

Manager Passenger Transportation and Housing Division, United States Shipping Board
Emergency Fleet Corporation

WHEN the United States went to war, enemy submarines were rapidly destroying the world's mercantile marine, and it was at once apparent that the winning of the war was largely dependent upon the building of ships in which to transport our men, munitions and supplies to the European battlefields.

The United States Shipping Board Emergency Fleet Corporation was established by Congress and endowed with the authority and funds to build the ships. Great shipyards were established; others were enlarged. Our problem was to get men to the shipyards to build the ships.

Many of the 203 shipyards on the Atlantic, Pacific, Gulf and Great Lakes were located in districts already congested by other war activities; others were of necessity located in districts which lacked the necessary local labor to build the ships.

In order to abate the labor deficiency in these yards, the United States Shipping Board Emergency Fleet Corporation established the Department of Housing and the Department of Passenger Transportation. It was soon found that the activities of these two departments were so closely related that they could function best as one; consequently, on May 7, 1918, they were merged by the formation of the Division of Passenger Transportation and Housing.

HOW THE DIVISION WAS ORGANIZED

Experienced and able transportation men, engineers, architects, builders and others were called and patriotically entered the service of their country in this division. Many of them made great personal sacrifices which have been fully justified by the results of their efforts under the able leadership of the two assistant managers of the division, Garrett T. Seely, normally assistant general manager of the Chicago Elevated Railroads, who has been in charge of the Transportation Department, and J. Willison Smith, normally vice-president of the Land Title & Trust Company, who has been in charge of the Housing Department; and I have record that a part of the success of our undertaking has been due to the exceptional executive ability and indomitable energy of these two men.



A. MERRITT TAYLOR

Mr. Taylor, previous to his connection with the Emergency Fleet Corporation, was best known for his work as transit commissioner, and later as director of city transit, of Philadelphia, Pa. After serving an apprenticeship as a boy in the machine shops of Wm. Sellers & Company, in Philadelphia, he became interested in investment securities, and in the development of transportation properties. In this field he was very successful and he still retains the presidency of the Philadelphia & Westchester Traction Company, to which he was elected when but twenty-four years of age.

Our other associates, many of them leaders in their professions, possessed of rare executive ability, have each and every one of them contributed in a large way in securing the required results, and I shall always be proud of having been associated with such a splendid coterie of patriotic citizens.

A quick survey developed the present and prospective labor deficiency in each shipyard which was resultant from lack of available housing facilities. All existing housing facilities which were found to be unavailable, owing to lack of proper and necessary transportation facilities, were promptly made available by co-operation between the Fleet Corporation and the transportation companies, in financing the construction of required extensions and by enlarging existing facilities, also by the establishment of additional or new transportation facilities.

A separate appropriation of \$20,000,000 was made by Congress for the construction of transportation facilities, and of this amount approximately \$12,000,000 was utilized, the greater part of which is adequately secured and will be returned to the United States Treasury with interest at 5 per cent.

Our policy has been to encourage, help and require transportation companies to improve their existing facilities and methods of operation with a minimum capital expenditure, and thus to increase the capacity of their existing facilities to transport the additional traffic with a minimum increase in operating costs and fixed charges; also to bring about co-operation of industrial plants in staggering hours whereby the capacity of transportation lines to serve such plants has been increased twofold over night.

THE WAR WORK DONE

The general results obtained are illustrated by two accompanying charts. One illustrates the progress and results of the activities of the division in locating and relieving transportation deficiencies with relation to the total dead-weight tonnage program of ship production by the Emergency Fleet Corporation in the United States. The other illustrates the locations at which transportation facilities have been improved, the gen-

eral character of the improvements, and the locations at which housing projects have been established.

The principal enlargements and extensions of transportation facilities consisted of the following:

The purchase of 320 new street cars and thirty-five second-hand street cars was financed for the service of seventeen shipyards.

Street railway extensions were either built or financed for the service of eleven shipyards.

Track changes and loops were financed for sixteen shipyards.

Enlargement of railway power-plant facilities was financed for seventeen shipyards.

Thirty steamboats were placed in service for twenty shipyards.

Sixty special steam railroad trains were placed in service for twenty-six shipyards.

Street railway schedules were improved for forty shipyards.

Working hours were staggered at ten shipyards.

Steam railroad schedules were improved for twelve shipyards.

Over 125,000 shipyard employees are now being transported by the additional transportation facilities thus established.

Through the generous co-operation of electric railway companies, 57,000 additional shipyard workers were being conveyed over their lines to the shipyards on the day when the armistice was signed.

The co-operation which has been accorded the government by the electric railway industry and by all electric railway executives through the Division of Passenger Transportation and Housing of the Fleet Corporation has been, without exception, most patriotic and efficient.

It is with pride and much gratitude that I am able to point out to our industry the important part which it has had in thus expediting ship production and in bringing the war to an early termination.

After exhausting all existing housing facilities which could well be made available by transportation service, many shipyards were still unable to secure the men required to build the ships because there was no place for them to live within access of such yards; therefore, a quick resurvey was made which determined the number of additional men required for the production of ships at such yards and the extent of the delay in ship production in such yards, resultant from inadequate housing facilities.

The number and character of the houses which were then required to abate the deficiency were determined and they were promptly built. They included: 8949 substantial individual houses; 1119 substantial apartments; nineteen dormitories; eight substantial hotels.

The foregoing projects have capacity to house 27,732 shipyard workers or 55,324 individuals, and include necessary stores therefor.

The allotments for these projects aggregate \$65,883,845.

Substantially all of the aforesaid buildings are in advanced stages of construction or completed. More than 3800 of them are entirely completed with a capacity to house approximately 12,200 shipyard workers.

Although possessed of plenary powers, the Fleet Corporation in dealing with transportation problems has regarded and protected the rights of transportation companies throughout the great emergency which called for instant action.

Public officials, street railway executives and the public were brought together and shown what was their duty to each other and to their government, and a better understanding has thus been gained of the respective rights of electric railways, of municipalities and of the public, and of their respective duties to one another which should be of lasting benefit to all of them.

A BETTER UNDERSTANDING HAD OF PUBLIC UTILITY CONDITIONS

The public generally has, during the war, come to understand that the financial necessities of electric railways must be met or the traveling public must suffer from inefficient service, also that electric railways are just as essential to the body politic as the circulatory system is to the body human; hence the body politic is not going to permit the electric railways to be paralyzed by misguided public officials or by those who through ulterior motives, lambast vested interests. I predict that the time is at hand when those who persist in these nefarious practices will be branded as public enemies and driven out of public life by an enlightened and incensed public.

The war has taught the American people the value of co-operation and what it accomplishes.

Now is the time for all public utility companies to recognize the necessity of co-operation between them and

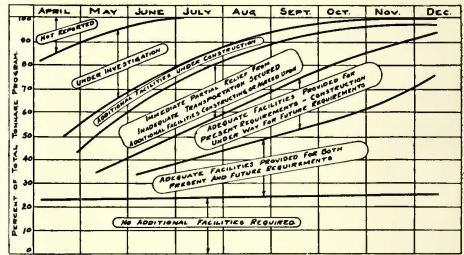


CHART SHOWING PROGRESS OF ACTIVITIES OF DIVISION IN RELIEVING TRANSPORTATION DEFICIENCIES, PLOTTED IN PERCENTAGE OF TOTAL TONNAGE PROGRAM

their customers. When this co-operation is developed through the establishment of mutual confidence, which must be brought about through frankness and a complete understanding of the respective rights, duties and necessities of each, there will be no apprehension or injustice on the part of the public, public officials or the management of electric railways.

Twenty years of study and consideration of the problems affecting public utilities, made during various periods in the interest of the United States and municipalities on the one hand and public utility companies on the other hand, and extended investigations made during the war in many localities along our Atlantic and Pacific seabords and on the shores of the Gulf and Great Lakes, have led me to these happy conclusions.

Among electric railway executives the constructive optimist is to-day the best asset of our industry, and the destructive pessimist is the heaviest burden which it has to carry.

Recent Developments in Service-at-Cost Franchises for Utilities

The Principal Provisions of the Various Service-at-Cost Franchises of Electric Railway Companies Are Described with Great Care and Compared as to Results—The Author Then Draws Conclusions as to the Most Desirable Forms of a Service-at-Cost Franchise

BY L. R. NASH

Stone & Webster, Boston, Mass.

THE year 1918 witnessed a noteworthy development in railway franchises, in which the fundamental feature is the rendering of service at actual cost. Franchises of this kind are not new in the United States, their use covering a period of more than ten years, but until quite recently their number has been very small and the results of their operation not wholly satisfactory. The new franchises drawn during the past year have attempted to cure the defects which have developed from experience with the earlier models and are of further interest through their reflection of the changes in economic thought applicable to public utilities.

Further attention to this subject has doubtless been stimulated recently by the serious financial difficulties which have befallen the electric railway industry since the civilized world took up its sword in defense of justice and freedom. As a rule the railways have found a 5-cent fare insufficient to cover war-time costs of service and have attempted to secure higher rates. Many of them operated under long-term franchises limiting fares to the established, conventional rate, which presumably held promise of profit when originally adopted. Rapid extensions and improvement of service, transfer privileges and other concessions have kept pace with or outstripped natural increases in business and efficiency to such an extent that the present crisis has been encountered with entirely inadequate reserves.

While many municipalities have unwisely insisted that franchise fare limitations must be strictly observed regardless of consequences, others with breadth of vision have recognized unprecedented conditions and the essential part that transportation plays in our civic and national activities. Some of these latter cities have also taken the precaution to go beyond the bare necessities of a present fare increase and have limited the increase to the period of abnormal conditions. A few of them have gone further and provided that the subsequent reduction shall be proportional to the change in conditions; in other words, they have prepared new franchises



L. R. NASH

Mr. Nash has been connected with Stone & Webster for the past twenty-three years. He entered through the engineering department and has been both a constructing engineer and utility manager, but latterly he has been devoting most of his time to public relations and to appraisal and rate cases and has engaged in work of this kind for more than thirty public utility properties in different parts of the United States and Canada. He has also lectured on his specialties at the Massachusetts Institute of Technology and Harvard University, from both of which he has received degrees.

embodying the service-at-cost principle.

Within a period of a little more than a year agreements have been reached between municipalities and electric railways with respect to service-at-cost franchises in the following large American cities: Dallas, Tex.; Philadelphia, Pa.; Montreal, Que.; Chicago, Ill., and Cincinnati, Ohio. The service-at-cost principle has been applied by legislative acts to the Boston Elevated Railway and the Bay State system and made available to all other street railways in Massachusetts. Negotiations looking to its adoption have been in progress in other widely scattered communities, notably St. Louis and the Twin Cities. Cities in which similar franchises have been in use for longer periods include the following: Chicago, Ill. (surface lines); Cleveland, Ohio; Des Moines, Iowa; Kansas City, Mo.

Not all these so-called service-at-cost franchises provide, strictly speaking, for the base cost of the service and no more in the prescribed revenue. Some of them em-

body the sliding scale of rates and return in use by the Boston Consolidated Gas Company and, more extensively, in England, but in a comparatively restricted way. Others provide for a distribution of profits between city and railway. Where the city is required to use its proportion for improvements, extension or ultimate purchase of the railway, service-at-cost still obtains in the long run, although present patrons help to pay the cost of future service. Where the city is not restricted in the use of its proportion of the profits or imposes a special rental or franchise tax, the principle in question is departed from and the prescribed fares cover service-at-cost plus an abnormal part of the city's administrative expenses.

The need of increased fare has not as yet been the primary motive behind the negotiation of most of these franchises, but rather the impending expiration of old grants or the requirements of reorganization, but the example set in Massachusetts, where additional revenue was practically the sole object of the service-at-cost leg-

isolation, will doubtless be followed in other communities in the near future.

It is the purpose of this discussion to set forth and compare the distinctive features of the various franchises referred to above, to indicate those features which have found general or recent favor, and to criticize those which are illogical or economically unsound, to the end that an interested reader may assemble such features as appeal to him as the foundation of a model service-at-cost franchise.

Inasmuch as many important features of these various franchises were influenced or controlled by past franchise history and other local conditions, a brief statement of each local situation may throw some light upon the comments on franchise features which follow.

SOME PIONEER SERVICE-AT-COST FRANCHISES DESCRIBED

The Chicago franchises, granted in 1907 in substantially identical general terms to the two principal surface railways serving the city, were renewals of sundry old grants, some of which had already expired, and others were nearing expiration. Extended exploitation of some of these old franchises and alleged exorbitant profits therefrom impelled the city to devise certain safeguards against future similar possibilities. The result, reached after long controversy and exhaustive study, was our first noteworthy franchise of the service-at-cost form. The two principal railways, with subsidiaries, were later combined for operating purposes into a unified surface system.

The acquisition of the Chicago elevated lines by the same ownership and the necessary future association therewith of the comprehensive system of subways projected by the city, led logically to the drafting of a new consolidated franchise covering the existing local transportation facilities and the leasing of the subways to be built and owned by the city. This franchise, which had the indorsement of the business interests of the city, was passed by the City Council in August, 1918, but was rejected at a referendum on Nov. 5, 1918, the opposition being led by certain political and labor elements. The city retained Walter L. Fisher as special counsel in connection with the extended negotiations, he having also served in the drafting of the 1907 franchises. Because the consolidated franchise draft embodies so many features which will doubtless have a place in future franchise negotiations, it has been included in this discussion to the same extent as if it had become effective.

The second franchise of this class, granted in 1909 to the Cleveland Railway in renewal of expired and expiring grants, conforms more nearly to modern service-at-cost standards. It was the outcome of years of bitter struggle, unparalleled in the street railway history of this country, involving receivership, municipal competition, demoralization of service and wreckage of physical property, in which Tom L. Johnson played a dominant part.

In 1914, Kansas City, Mo., granted a new franchise to the Kansas City Railways, organized to succeed the Metropolitan Street Railway then in the hands of receivers. Reorganization and other necessary formalities delayed the putting into effect of this franchise until

Feb. 15, 1916, when the Kansas City Railways began operation. A substantial portion of its provisions became effective, however, immediately after its passage on July 7, 1914, and continued in effect throughout the receivership. The primary motive in granting the new franchise was to secure much-needed extensions and improvements which the company was unable to finance under the old franchise, which had only a few more years to run.

The Des Moines (Iowa) City Railway started operations under its new franchise on Jan. 1, 1916. Its old franchises had expired and negotiations looking to renewals had been carried on with the city covering a period of ten years. Progress had been unsatisfactory and receivership followed. Finally the court fixed a period of two years within which the city and company must come to an agreement, failing which the city would be deprived of street car service and the company would be required to remove its property from the streets. The agreement herein referred to was accordingly made. It lacks some of the modern features but still has others of interest.

In 1916 Dallas, Tex., passed a new franchise which became effective on Oct. 1 of the following year. It provides for the consolidation of three existing local companies into the Dallas Railways, and the leasing of local lines of another company. It replaced old franchises having only a few years to run under which the logical development of the properties had been retarded.

The new Philadelphia franchise, passed on Jan. 3, 1918, has for its primary object the lease of the city's subway and elevated system by the Rapid Transit Company, and the unified operation of surface and rapid transit lines. It supplements a grant made in 1907 which remains in effect except as modified by the new one. This franchise is now awaiting approval by the Pennsylvania Public Service Commission before becoming effective.

In 1916, the Montreal Tramways found itself in need of additional or extended franchise rights and started negotiations with the city officials for such rights. Opposition developed and finally led to the appointment by the Provincial Government of a commission to investigate the situation and draft a franchise, fair alike to the company and to the communities served. This novel procedure removed the question from the field of local influence and politics, which, in many cases, including one referred to above, have prevented just settlements. The franchise recommended by the commission, with some modification, was approved by the city and accepted by the company on Jan. 28, 1918.

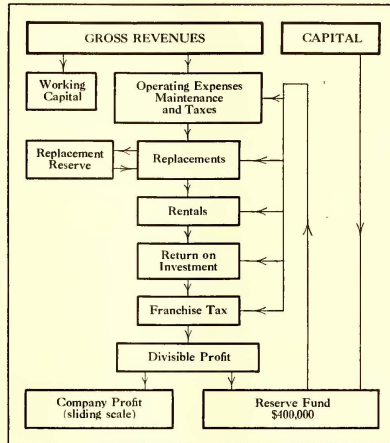
On Aug. 23, 1918, the city of Cincinnati passed an ordinance amending the existing franchise of the Cincinnati Traction Company, granted in 1896 and continuing until 1931, to provide for higher fares and closer regulation. The proceeding was started by a petition from the company asking for permission to increase its fares to compensate in part for war-time increases in cost of labor and materials. The amended franchise, which became effective in September, did not grant an increase immediately but defined the procedure under which it may automatically become effective in the near future.

On May 22, 1918, the Massachusetts Legislature en-

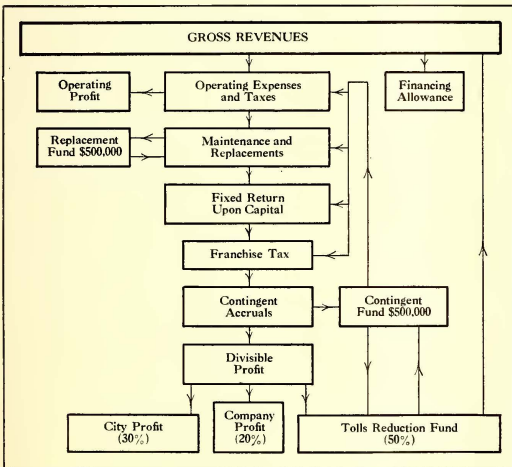
acted a measure providing for public control of the affairs of the Boston Elevated Railway for a period of not less than ten years. The sole object of this act was to effect financial and physical rehabilitation of the system, and to this end a 5-cent fare limitation in the company's charter was removed. As this charter embodied the company's operating rights not only in Boston but in a large tributary area, the amendment of these rights was logically a matter of State legislation. This act was duly accepted and became effective on July 1, 1918, and promises long-needed relief from the burdens of expanding rapid transit facilities which could no longer be carried by a fixed 5-cent fare. The act provides that if the property is returned to private management it shall not thereafter be subject to public regulation which will deprive it of sufficient income to meet the cost of service, as defined in the act. On June 3, 1918, the Massachusetts Legislature passed a similar measure applicable to the Bay State Street Railway, which serves a large

company contemplated by the act to take over the Bay State property.

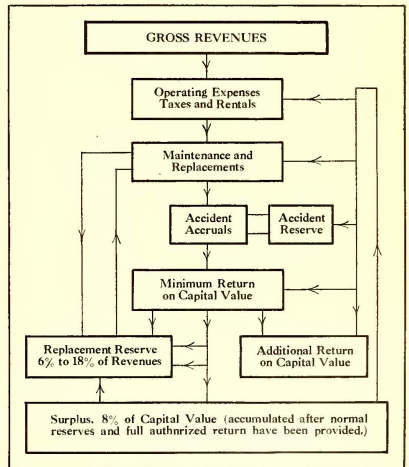
About the same time the Massachusetts Legislature also enacted a general measure under which any other street railway in the State may voluntarily accept a service-at-cost plan of operation under State supervision. This is further referred to herein as the "Massachusetts act." It has so far not been accepted by any of the railways to which it is applicable, primarily on account of the present difficulty of setting up in advance the required reserve fund. The procedure first embodied in these several Massachusetts measures, of transferring the control of public utilities from private management to trustees representing the public, was the result of a desperate need of action, prompt, far-reaching and fearless, which would be accepted by a critical public with far less protest when coming from their own appointees than from private officials, so often assumed to be under control of financial interests. This re-



Cincinnati Traction Company



Montreal Tramways Company



Dallas Railways Company

DIAGRAMS SHOWING DISPOSITION OF ITEMS UNDER SERVICE-AT-COST OPERATION

proportion of the urban and rural population of eastern Massachusetts. Its purpose was substantially the same as in the case of the Boston Elevated bill, the Bay State system having for some time been in the hands of a receiver. Management of this property has not yet been taken over by trustees because it has so far been impossible to organize and finance the new operating com-

view of recent agreements might properly include the so-called "dual subway" contracts under which the new subways in New York will be operated. They are omitted because they are not in general effect, and the division of profits provided for therein does not differ essentially from that in effect or contemplated in other cities whose railway franchises are described.

Passing from this historical review, it is now in order to consider more in detail the distinctive features of the various service-at-cost franchises. With so many elements common to all, the logical procedure is adopted of arranging the description and discussion by elements, with a statement of the peculiar features of each appearing in the different franchises. General provisions, applicable to any form of franchise, are omitted unless they assume special significance in the form under discussion.

LIFE OF FRANCHISE

Most of these franchises do not differ from the older forms in the length of their term, which in many cases is limited by state legislation, other than to provide for earlier termination by municipal purchase as elsewhere described. The Chicago consolidated franchise

TABLE I—INITIAL CAPITAL VALUE

In Approximate Figures Per Mile of Single Track of Various Service-at-Cost Electric Railways

Chicago (1907).....	\$92,000
Cleveland.....	98,000
Kansas City, Mo.....	132,000
Des Moines.....	54,000
Dallas*.....	65,000
Montreal.....	139,000
Cincinnati.....	138,000

*No power station.

is of the indeterminate form, as are those in Massachusetts, in accordance with the established practice in that State. The Dallas franchise has a fixed initial term of ten years, after which it continues without limit except for purchase provisions.

The advantages of unlimited life, in avoiding amortization of investment in excess of adequate provisions for depreciation, and in not discouraging improvements and extensions at any period, are too obvious to need elaboration.

VALUATION

Under one name or another all the franchises herein considered embody an amount used as the basis of return to investors. In most cases the same amount, or another derived from it, is established as the price for municipal purchase. The term "capital value," used in some of the franchises, is adopted herein to designate the rate base. With respect to the initial capital value, the different franchises show a wide range as compared with the actual investment or normal cost of reproduction. The approximate initial amount per mile of track is shown for a number of the service-at-cost cities in an accompanying table.

The Chicago, 1907, surface franchises contain capital values fixed by a commission after a careful appraisal of the properties and determination of their physical condition. The values adopted were the "present value" or cost of reproduction less depreciation. There has been frequent criticism of these values, much of it in connection with the recent franchise campaign, as being too liberal. A careful study of the figures does not furnish support for such criticisms. The physical value allowed for the two principal systems was less than 75 per cent of their combined cost of reproduction. The amounts added to the physical values for franchise values and other intangibles, bringing the compromised total up to \$50,000,000, were comparatively small. While a considerable proportion of

the reconstruction costs during the initial rehabilitation periods was charged to capital value, there is every reason to give credence to the opinion of the Board of Supervising Engineers, Chicago Traction, that "It is doubtful if a large unified traction company exists in this country to-day which contains a greater percentage of actual physical value in its capitalization."

In the recently rejected consolidated franchise, the capital value was fixed as the current capital value of the surface railways plus a value for the elevated lines determined in a manner similar to that originally followed with the surface lines.

The original Cleveland capital value was the subject of extended controversy and is still freely criticised as unfair to the investors in the property. This value was fixed by Judge Tayler, the arbitrator, at slightly more than \$24,000,000. After deducting the outstanding indebtedness, there remained for the stockholders a balance amounting to only 55 per cent of the par value of their holdings. The outstanding stock was surrendered and new certificates were issued for 55 per cent of the original amounts. The 45 per cent of par value thus wiped out amounted to \$10,530,000. The full value of all outstanding securities was only slightly in excess of the undepreciated value fixed in the appraisal, which was the basis of Judge Tayler's determination. There was no evidence to show that the property had in the past earned a depreciation reserve or a fair return to investors. Without such evidence there is no economic justification for depreciation of value. No going value element was included.

The Kansas City capital value was determined from an appraisal made in 1912. While the full cost of reproduction was not allowed, the depreciation was more than offset by intangible elements. The very thorough study made in this case of early deficits, franchise values, actual investment, market values and other pertinent elements, is worthy of very careful study in connection with future franchise settlements. Further reference will be made in this article to the intangible elements amounting to about 25 per cent of the full capital value.

The initial capital value included in the Des Moines franchise, \$5,000,000, was the result of compromise after the extended negotiations already referred to, and its relation to actual investment is not known. It was only slightly less than the then outstanding capitalization.

The Dallas value was also the result of compromise but was materially below the usual standards. It was about 80 per cent of the actual investment in the properties, which corresponded quite closely with their cost of reproduction. A large going value or development cost was entirely ignored.

No new values were established in the recent amendments to the Philadelphia Rapid Transit franchise. Actual indebtedness and the par value of the \$30,000,000 of capital stock approved in the 1907 franchise plus actual expenditures for new facilities form the basis of the return to investors.

The capital value fixed by the provincial commission for the Montreal franchise was in fairly close agreement with the company's capitalization and is believed to be approximately equal to the cost of reproduction of the property.

The recent amendment to the Cincinnati franchise does not definitely name a complete capital value for rate purposes but does establish a base, determined by appraisal, for a municipal price.

The several Massachusetts railway acts considered herein recognize, as far as capital value is concerned, the long-established custom in that State of basing return and purchase price upon actual cash investment, "honestly and prudently made," without deductions for depreciation or other theoretical factors and without specific reference to the form of securities outstanding. This same policy, adhered to by the Massachusetts commissions in the face of widely different methods advocated in other states with less complete regulatory experience, has materially increased the stability of public utility investments within their jurisdiction.

Starting with the initial capital values as herein described, a continuous record is kept for purposes of return or purchase, or both. The procedure is in most cases similar. Approved additions to property are included at actual cost or with an arbitrary allowance for certain overhead elements such as supervision, financing, etc. Property lost or retired is similarly deducted from capital value, logically and usually by the amount representing its cost or other value previously included in capital value. In the case of Cleveland, this practice is not followed. If worn out or obsolete elements of property are replaced by new elements, the capital value is increased only by the excess cost of the new elements over the estimated cost of the replaced elements new at the time of replacement.

The property included in the initial capital value was entered at an average of 70 per cent of its then cost of reproduction. If it were withdrawn from time to time at this same depreciated value and replaced by new property at full value, the initial 30 per cent depreciation would ultimately disappear. This possibility has been carefully avoided and the initial depreciation, with whatever injustice to stockholders was involved therein, will always remain, although subsequent stockholders are assured a continuous return upon their full investment. This discriminatory feature is not to be found in full in any other of these modern franchises. In the Dallas franchise, which embodies a similarly depreciated value, this Cleveland provision applies after an initial rehabilitation period of two and one-half years within which a large amount of reconstruction was required, including those elements of the property which had experienced maximum depreciation.

The capital value set up in these franchises includes, or has added to it for rate purposes, an allowance for working capital, including cash, supplies, net current assets, etc. In a few cases a distinct fixed sum or a fixed percentage of gross revenues is established, but more commonly the amount included in the original appraisal, on which the capital value was based, is continued unless or until a larger amount is authorized.

A review of the different bases of capital value used in these franchises shows a preponderance in favor of cost of reproduction or actual investment without deduction for accrued depreciation. Actual investment as a basis for rates has so many obvious and logical advantages as to give it increasing favor in regulatory practice. It would probably have much wider use but for

the difficulty of determining it from the records of old properties which may have been through many reorganizations or consolidations. Where the difficulties of determining actual investment are insurmountable, the cost of reproduction gives a suitably close agreement with probable investment, and may be used without injustice, particularly if historical prices and conditions are applied. Neither actual investment nor cost of reproduction should be diminished for depreciation unless a careful study of the entire financial history of the property shows that the investors therein have taken such a large average return from the property as clearly to justify the opinion that a part thereof was in effect amortization of investment. If the investors have received no more than a fair return and the property has had reasonable provision for its upkeep, there is no economic justification for a depreciated value.

SUPERVISION

Control of operation, construction and financing by city or state authorities is embodied in all service-at-cost franchises. It is usually in the administrative hands of a local supervisor or board responsible to the municipal governing body. The term "supervisor" is generally used herein to designate one or more persons occupying this office.

A single supervisor is provided in Cleveland, Dallas and Cincinnati, acting in each case as a representative of the City Council with limited personal authority or responsibility.

Boards of two supervisors representing city and railway respectively, with provision for a temporary or premanent third member as arbitrator, are found in Kansas City, Des Moines and Philadelphia. The railway members are presumably regular officials of the companies. A permanent board of three members, appointed for a term of ten years or good behavior by a provincial official, serves in Montreal, with no direct responsibility to the city administration.

In certain cases, particularly Philadelphia and Montreal, appeal from a decision of the supervising board may be taken to the public service commission of the State or Province. In fact, the Montreal board may be called a local agent of the Quebec Public Utilities Commission, which retains general jurisdiction and may intervene as in other localities. The results of this relationship should be of interest and offers a possible compromise solution of the frequent demand for "home rule" in utility regulation.

The Chicago consolidated franchise and the Boston Elevated and Bay State acts embody the new principle of public administration of private property. The Massachusetts trustees, five in number in each case, are appointed for ten-year terms by the Governor and have very broad administrative powers entirely independent of public service commissions and local authorities. The Chicago trustees, nine in number, who are in reality to be directors of a new holding company not for profit, serve for overlapping three-year terms. The original board was selected by agreement but ultimately the appointing power lies in the city of Chicago. It is contemplated that a comparatively small executive committee will have direct charge of administrative affairs of the surface, elevated and subway lines.

The trustee principle is a compromise between regulated private operation and complete municipal ownership. It promotes that confidence with persistently attaches itself to public operations, but avoids the proverbial inefficiency of such operations and the subjection of new bodies of voters to political control. Where confidence already exists in the public utilities or their regulatory commissions, public trustees would serve no necessary purpose. Where it does not exist, temporary public operation such as is provided in the Massachusetts acts, may serve to restore it and permit subsequent satisfactory service under restored private operation.

As far as the usual local supervision is concerned, the success so far attained with a single official would indicate that an independent, larger board is not required except in quite large cities, provided the appointment is free from political influences. It is suggested that the appointment or nomination of such an official might well be made by the state utilities commission. This would tend to insure the needed technical training

THE trustee principle is a compromise between regulated private operation and complete municipal ownership. It promotes that confidence which persistently attaches itself to public operations, but avoids the proverbial inefficiency of such operations and the subjection of new bodies of voters to political control. Where confidence already exists in the public utilities or their regulatory commissions, public trustees would serve no necessary purpose. Where it does not exist, temporary public operation such as is provided in the Massachusetts acts, may serve to restore it and permit subsequent satisfactory service under restored private operation.

and promote harmony between city and state in the regulation of the utilities affected. The local supervisor may well serve as an agent of the utilities commission in matters over which it retains jurisdiction, relieving the commission of many local details and allaying opposition to state regulation. A board of trustees as large as that contemplated in the Chicago consolidated franchise is too large for effectiveness unless its active duties and responsibilities are assigned to a comparatively small executive committee.

FRANCHISE TAXES

A special tax upon municipal franchises may be considered as a payment for special, exclusive rights to conduct a profitable business, or as a charge for the location of fixtures upon public property. As far as electric railways are concerned, such taxes have usually taken the form of a fixed fee per year per mile of track, per car operated, or per pole erected upon public streets, or a percentage of gross earnings, or a lump sum to cover one or more of these elements.

In the old days when the street car business was, or was supposed to be, a profitable unregulated undertaking at the conventional 5-cent fare, any amount which municipal authorities could extract from this business

lessened the burdens of taxation on other property without offsetting disadvantages other than a possible, minor impairment of service.

In these present days of regulated public service, all tax burdens are included in the cost of the service which the patrons are expected to pay. Regulation has not always accomplished its intended purpose, and charges for service may remain higher or lower than actual cost. This, however, is not true under service-at-cost franchises. Any inequitable taxes imposed upon electric railways under service-at-cost operation transfers to their patrons, through higher fares or poorer service, burdens which the community as a whole should carry. To the extent that the patrons of the railways are not well-to-do or property owners, the injustice to them in such taxation is multiplied.

This fact is recognized in most of the service-at-cost franchises as far as direct taxation is concerned. In two of them, however, a direct franchise tax or "rental" is imposed. In Montreal, the tramways company pays the city a rental of \$500,000 per year, or about 6 per cent of its present gross revenue. In Cincinnati, the traction company pays a "tax on gross earnings" or \$350,000 per year, or about 8 per cent of revenue.

With respect to indirect burdens which may be considered as a form of taxation, such as street paving, cleaning, sprinkling, etc., most of the service-at-cost franchises do not differ essentially from the older forms. Logically, there is no excuse for continuing such practice. Since the passing of the horse cars, the operation of the street railways has imposed no material additional burdens upon pavements, but they have continued to pay a large proportion of the cost. Hundreds of miles of streets have been paved solely because of the car tracks therein, and the street car revenues have been steadily decreased by the resulting encouragement to vehicular traffic.

Some recognition has been given to this thought in several of the franchises under discussion. In Montreal and Cleveland, the railways do not pay for new paving but do pay their proportion of maintenance. In the new Chicago franchise the usual paving, repaving, cleaning and sprinkling requirements are included, but the cleaning and sprinkling part must be omitted if at any time a deficit has been created and an increase in fare would otherwise be necessary.

A model service-at-cost franchise should entirely omit all such special taxes and street maintenance except any actual repairs or cleaning incident to car operation.

PUBLIC CONTRIBUTIONS

The State of Massachusetts, always a pioneer in public regulation, has gone one step further than the relief from special taxation discussed in the preceding section. It has provided in the Boston Elevated and Bay State acts and a separate act applicable to other street railways, that cities and towns may contribute through taxation toward the operating costs of street railways which serve them. In the case of the Boston Elevated, this relief is intended to be temporary, the advances to be refunded if possible from surplus subsequently accumulated through higher fares or more successful operation. There is, however, no specific obligation in the act to make such refund.

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In the case of other railways the contributions may be made permanent, in lieu of higher fares, or to prevent curtailment or abandonment of service otherwise necessary. These contributions are limited to 50 cents per \$1,000 of valuation in cities and \$1 per \$1,000 in towns and are made under terms and conditions approved by the utilities commission. Several communities have taken advantage of this act within the last few weeks to retain service which would otherwise have been discontinued. While this relief is limited to the period of the war and two years after its official termination, it indicates a very definite change in the public attitude toward the electric railway industry. Instead of its being considered a profitable private monopoly to be taxed as far as possible for the support of the state, it is being regarded as a public institution which must be maintained, through taxation if necessary.

The Philadelphia franchise contains an interesting provision having the same effect as aid through taxation. In connection with the rental to the railway of the city's rapid transit system on a percentage-of-cost basis, the city, to avoid or minimize an otherwise necessary fare increase, may withdraw from rental requirements any or all of its transit facilities used by the railway and collect the interest and sinking fund charges thereon through general taxation. This is in addition to the prescribed practice of caring for such charges on new sections of the rapid transit system through general taxation for one year after they begin to operate.

The Bay State act provides that, during the war and for two years thereafter, the railway shall not be required to pay for any paving, or other street or bridge improvements or repairs, abolition of grade crossings, putting wires underground, or other non-essential work. So far as such work continues to be done, direct taxation therefor is increased to relieve the railway.

The policies outlined are in marked contrast to those prevailing in Montreal and Cincinnati, where the cities not only exact a large franchise tax but also take a larger share of the surplus than goes to the railways.

FARE SCHEDULES

The kind of charges that may be made to cover the cost of service are defined in most of the service-at-cost grants but not in all. There is a tendency in recent grants to allow more latitude in this direction to the supervising authority. The first franchise to lay down a specific schedule of fares, from one step of which to another the fares would go up or down with increased or decreased cost, was the Taylor grant in Cleveland. The ten steps in this schedule, starting with a 2-cent fare, did not contemplate that it would ever be necessary to go as high as 5 cents in Cleveland, the highest authorized rate being 4 cents cash, or seven tickets for 25 cents, plus 1 cent for transfers. The steps were intended to vary from each other by about 10 per cent, but changes in routing and transfer requirements upset the symmetry of the schedule so that certain steps became practically useless. It was necessary in 1918, partly on account of war-time costs, to amend this franchise to increase the upper limit of fares by adding five new steps, the one now in effect being 5 cents plus 1 cent for transfers. The maximum new step is 6 cents, nine tickets for 50 cents, 1 cent for transfers.

The Dallas fare schedule is simpler, with a uniform cash fare of 5 cents with free transfers, but with tickets at twenty-two, twenty-four, twenty-eight and thirty-two for \$1 respectively in the four specified steps (sold in 25-cent lots where divisible by four).

The Cincinnati schedule includes only three specific steps, 5, 5½ and 6 cents respectively, but provides for as many others, up or down at ½ cent intervals, as may be required.

No other franchises of this class include a specific range of fares, but the Boston and Bay State acts provide that the trustees shall prepare and publish fare schedules with steps above and below that in effect, all such schedules to be subject to revision at the will of the trustees. The Chicago surface, Kansas City and Des Moines grants fix the standard fare at 5 cents. The Kansas City, Mo., fare has recently been increased

ACTUAL investment as a basis for rates has so many obvious and logical advantages as to give it increasing favor in regulatory practice. It would probably have much wider use but for the difficulty of determining it from the records of old properties which may have been through many reorganizations or consolidations. Where the difficulties of determining actual investment are insurmountable, the cost of reproduction, using historical prices and conditions, gives a suitably close agreement with probable investment, and it may be used without injustice. Neither actual investment nor cost of reproduction should be diminished for depreciation unless a careful study of the entire financial history of the property shows that the investors therein have taken such a large average return from the property as clearly to justify the opinion that a part thereof was in effect amortization of investment. If the investors have received no more than a fair return and the property has had reasonable provision for its upkeep, there is no economic justification for a depreciated value.

to 6 cents by order of the Missouri commission. The Chicago consolidated franchise fixes the initial fare at 5 cents (or such other rate as may be in use when it becomes effective) and provides for a transfer charge of not more than 2 cents, between rapid transit and surface lines only, for further increases in costs of service. If this should prove insufficient, an increase in base fare is permissible without limit, although not very clearly so stated in the draft. The Des Moines City Council recently denied a petition for a 6-cent fare, claiming that it had no legal authority to do otherwise. A receivership for the railway promptly followed.

All the above franchises, and also the one in Montreal, provide for uniform fares within the city limits other than for possible charges for transfers. Such limitation is not imposed in Philadelphia, Boston or the Bay State territory. Philadelphia fare changes are restricted only by the supervisory power of the utilities commission. Boston and Bay State fares may be fixed

by the trustees without any such supervision. This territorial restriction in Montreal is the only one in this last group of cities bearing upon the character of fare revisions. The extent of the revisions at any one time is, however, restricted in some cases, particularly with respect to reductions. In Philadelphia, a downward revision is not permitted unless two successive years show substantial increases in surplus, and then the estimated annual loss in gross revenue from the reduction must not exceed one-third of the accumulated surplus. Revisions upward must be sufficient to make up losses "within a reasonable time."

The changes contemplated in the general Massachusetts act are exceedingly small per step, each being intended to be not more than 30 per cent of a reserve fund, which in turn is between 6 per cent and 12 per cent of the normal gross revenue. It is not clear how such small changes would be workable.

The Montreal provisions for fare changes are interesting, more from the point of view of extreme refinement than from their practical advantages. For example, fares may be decreased when a fund for their equalization reaches \$1,000,000 and must be decreased when it reaches \$2,500,000. When a decrease is made, the resulting lower revenues are supplemented by an appropriation from the fund of not more than 25 per cent of the accumulation therein. The estimated annual gross loss in revenue from the reduction must be greater than this percentage appropriation from the fund, but not greater than this percentage plus 37½ per cent of the additions which flowed into the fund during the preceding year from "divisible surplus." This appropriation from the fund to augment current revenues is continued annually until the balance remaining therein is less than the annual appropriation. No similar proceeding is possible in connection with fare increases. They must directly yield enough to make good accumulated losses. It is clear that, by the complicated safeguards surrounding fare reductions in Montreal, they must be kept within safe limits, determined by past profitability of the business, but it is yet to be demonstrated that suitable care is not assured by the simpler requirements in other franchises.

The two boards of trustees authorized in Massachusetts to administer the Boston Elevated and Bay State systems furnished the only illustrations of unrestricted freedom in the method of raising or lowering fares other than for the directions given in the act. If this arrangement proves successful, it will indicate the desirability of further simplification in this respect in future franchises.

Limited actual experience up to this time does not show any advantage in fare schedules definitely fixed in the franchise. The Cleveland schedule has failed as to both range and relation between steps. There is, however, advantage in having fixed at all times at least one step above and below the one in effect ready for use without delay, and the general principles embodied in the various scheduled steps should be clearly established and published. The supervisor should, however, have authority to change both the schedules and the basis upon which they are designed, possibly after public hearings and approval of the utilities commission. Only by such latitude can conditions like the present

be promptly and satisfactorily met. Under normal conditions fare changes should be neither frequent nor violent, indicating the advisability of fairly wide limits in a liberal "barometer" fund.

COST OF SERVICE

This is the central feature of all the franchises under consideration, the one which requires the most careful scrutiny. There is naturally a material difference among these franchises in their definitions of cost. The difference may be quite large in some of the elements, but when all these elements and their definitions are put together, the differences are found largely to offset each other so that the conceptions of total cost are reasonably consistent in most cases.

The significant elements of cost, as set forth in some or all of the various franchises, are stated in the following schedule:

1. Expenses of operation.
2. Maintenance and replacements.
3. Taxes.
4. Rental.
5. Return on capital value.
6. Amortization.
7. Surplus and reserves.

An attempt has been made to state these elements in the order of their importance or priorities. The latter exist even in cumulative form in some cases. A fundamental difference between the various franchises in this group is that some definitely limit or fix the important elements of cost, while others leave the matter very largely to the judgment of the supervisor. Definiteness is found most uniformly in the return to investors, but even here the rate of return is subject to variation in the majority of cases. The method of treating the various cost elements in the several franchises is explained in the following paragraphs:

1. Expenses of Operation

The Cleveland grant is the only one which imposes a strict and definite limit on operating expenses. The amount per car-mile which may be spent is fixed in the original franchise, and it may not be exceeded or changed without action of the City Council. If actual expenses are greater than the allowance, as has commonly been the case, the excess comes out of the company's pocket unless or until it has been validated. If the company runs under its operating allowance at any time, it may not retain the balance as a reserve to offset overruns but must turn it back at the end of the year. The company has habitually kept accounts of both its actual and allowed expenses and has at times accumulated an overrun of hundreds of thousands of dollars before validation, the allowance being very often too low. This arrangement obviously lacks flexibility, and the responsibility for adjustments rests with a large body of city officials not well acquainted with operating requirements and sometimes influenced by political motives. The initial Cleveland allowance for expenses, exclusive of maintenance, was 11½ cents per "ordinance" car-mile. This has been increased from time to time and is now 19½ cents.

The Montreal franchise has a somewhat similar operating expense allowance on a car-mile basis, but it is fixed annually in advance by the supervisor in the light

of recent experience and any anticipated changes in operating conditions. If the allowance is exceeded, due to unforeseen developments for which the railway is not responsible, the excess must be approved by the supervisor. Any excess for which the railway cannot give acceptable explanation must be made up from its own resources. A standard of traffic density is determined in connection with the expense allowance for closer definition. There is no obvious reason why this arrangement should not guard fully against extravagance, incompetency or other derelictions which it seeks to prevent.

In Cincinnati the railway must annually, in advance, prepare a detail expense budget and submit it to the supervisor for approval. With any necessary modifications agreed upon or fixed by arbitration, the budget becomes the basis of the year's operations. It may not be exceeded wholly or in any part without approval of the supervisor.

None of the other franchises in this group has any such definite provisions for avoiding excessive expenses. Presumably they all contemplate such close supervision of operations and scrutiny of reports thereof that any improper practices or tendencies would be at once detected and corrected. It would seem reasonable to concur in this majority opinion, at least until such defects develop in the practical workings of the simpler procedure as would justify the added complications and cost of the other.

2. Maintenance and Replacements

A larger number of these franchises have more specific requirements with respect to maintenance and replacements. Here, in contrast with current operating expenses, the intent is to insure adequacy rather than close adjustment to actual current requirements. To that end the maintenance and replacement account is made a continuing one from year to year, any unused appropriations being carried to a reserve.

On account of the difficulty of definitely distinguishing between current maintenance and renewals or replacements and also because of their interrelation, the two have in most cases been combined in franchise provisions relating thereto. The Chicago franchises furnish the only exceptions among those discussed. The consolidated draft follows the example of the 1907 surface grant in requiring a minimum annual expenditure or reserve for maintenance of 6 per cent of the gross revenues, and a corresponding 8 per cent for replacements or 14 per cent minimum total for total upkeep. Either or both percentages may be increased at will by the trustees, but no specific reserve is required as a condition of a fare reduction or otherwise.

The Cleveland franchise includes a combined maintenance and replacement allowance. It is on a car-mile basis, varying in different months of the year and averaging about 4.9 cents. Any amount not currently spent is credited to a reserve, but no accumulation has been possible. On the contrary, the allowance has proved so inadequate that in spite of numerous special appropriations and prorates, a deficit of more than \$2,600,000 was recently reported. Clearly, this allowance should have been increased years ago, as was the operating allowance, but allowances when once increased by ordinance are not easily reduced again. In August,

1918, the City Council granted an increase in this allowance to 6 cents for the period of the war and six months thereafter.

The Dallas provisions for repairs and replacements are more complicated but are interesting in that they embody ideas not found in any other franchises. A minimum expenditure for repairs and replacements is fixed at 10 per cent of the gross revenues. For each 1 per cent per annum return paid on the capital value in excess of 5 per cent, this 10 per cent minimum is increased by 3 per cent. With the contemplated normal return on the capital value of 7 per cent, the minimum accruals for repairs and replacements become 16 per cent.

After providing in any month for operating expenses, including a suitable accident reserve, taxes, the normal return on the capital value and the corresponding repair and replacement accrual, any balance remaining of current gross revenue must first be applied to increase the said accrual to 18 per cent for the current month and year, and thereafter to make up as far as possible any prior deficiencies in said accruals under 18 per cent.

These accruals are continued as herein described until the excess over actual expenditures accumulates in a reserve to the "normal" amount, after which they are reduced to such amount as will maintain the normal reserve. The normal amount is 6 per cent of the capital value when the fare schedule then in effect includes six tickets for 25 cents; it is 10 per cent of the capital value when seven tickets are sold for 25 cents, etc. This provision embodies in a systematic way the old practice of setting up reserves for depreciation in proportion to the prosperity of the business.

Prosperity is measured in this case by the rate of return on the capital value (fixed by the rate of fare). Starting with a minimum accrual and return of the percentages above stated, both increase together until an adequate reserve is created, and the reserve is made more liberal with increasing rates of return. This arrangement or its equivalent might well be embodied in other franchises, for it is impossible to tell definitely what constitutes an adequate reserve to provide for obsolescence, inadequacy, catastrophes and other indeterminate factors in addition to the more definite wear and decay. A practice that provides for little beyond the definite factors in hard times and liberally for the indeterminate factors in good times, should meet all reasonable requirements.

It might even be argued with force, particularly in the case of service-at-cost, that no advance provision should be made for certain of the indeterminate factors. When an inefficient property element is replaced by an efficient one, or a heavy wooden car by a light, modern, steel car, the cost of the change may well fall upon those who benefit thereby, the future users of the service. In many cases careful calculations would show that no additional burdens are thereby imposed upon these future users because the added charges and amortization would be offset by increased operating efficiencies. If the full burdens of depreciation were thrown on the users of the old facilities, the users of the new facilities would get improved service at reduced cost.

The Montreal franchise provides for a maintenance and renewal charge in operating expenses on a car

mileage basis, fixed in advance for each year by the supervisor, sufficient to keep the property permanently in good condition. The current excess over actual expenditures is added to a fund which must be accumulated to a normal amount of \$500,000. When this amount has been reached, subsequent charges for maintenance and renewals will be only sufficient to maintain the normal amount. So much of this fund as is not currently needed is invested in additions to the property or otherwise, and the interest thereon is added to the fund.

None of the other franchises in this group has specific charges or accumulations for these purposes. It is in all cases intended that the supervisors shall see that the properties are adequately maintained at all times. In the case of Cincinnati, the city or company may call upon the State Utilities Commission to prescribe suitable depreciation reserves. The advantages of freedom from rigid provisions for uncertain requirements are obvious. Under service-at-cost franchises, there is no question of diverting needed replacement funds to pay excessive dividends. Returns to investors are definite

ANY inequitable taxes imposed upon electric railways under service-at-cost operation transfer to their patrons, through higher fares or poorer service, burdens which the community as a whole should carry. To the extent that the patrons of the railways are not well-to-do or property owners, the injustice to them in such taxation is multiplied.

and there is no possibility of diversion. The problem of reserves for replacements involves theoretically the amount of destruction of capital incident to the unit use of the property. If this is currently overestimated, present patrons pay more and future patrons less than cost.

Under old forms of franchises with fixed rates of fare, the investor is the one who submits to fluctuations in return in case of bad guesses at depreciation. This is not the case with service-at-cost. If the average car rider were better acquainted with the economics of the situation, he might well ask why he should contribute largely to the accumulation of a fund for replacements which will never be used, the interest on which will permit car riders of some future day to pay less than the then current cost of replacements. A moderate reserve is undoubtedly needed. The specifically fixed reserves mentioned, not exceeding 10 per cent of the capital value, are not excessive. A theoretical reserve, amounting to perhaps four times that limit, which might be set up under some of the other franchises, has no practical justification.

3. Taxes

The tax feature of these franchises needs very little further comment. The actual taxes, subject to little control by either railway or supervisor, are a necessary part of the cost of service. It is proper that the city should not impose any illogical tax burdens or permit other taxing authorities to do so. Cleveland has been notably active in this direction, joining with the rail-

way a few years ago in a suit to bring about reduced State taxation of the railway property.

4. Rentals

The leasing of transit facilities from other utilities or from municipalities is not uncommon. When the leased facilities are comparatively unimportant, the rent is included among the operating expenses. Where the leased property is as extensive as that included under several of the service-at-cost franchises, more critical attention is necessary. The Dallas and Cincinnati franchises authorize the railways to include in the cost of service the actual rental in very substantial amounts paid to other railways for use of tracks and other facilities under prior agreements made between the parties at interest. In Chicago and Philadelphia the leasing of city-owned rapid transit facilities is a very important feature of the recent franchise drafts.

The Philadelphia terms are noteworthy for their liberality. The railway undertakes to reimburse the city for actual interest and sinking fund payments on the city's certified investment in subways, elevated structures and equipment "as and if earned." These rental payments are made from the balance, called "current net revenue," remaining after the gross revenues have provided in full for the following items: (1) operating expenses; (2) taxes; (3) fixed charges on the company's prior obligations; (4) fixed charges and dividends on securities issued pursuant to the new grant for new transit facilities and extensions of the old system; (5) accruals to depreciation reserves for the city's transit facilities, the company's associated transit facilities, and for the balance of the company's system; (6) sundry payments to the city required under the 1907 franchise.

The balance after these six items are taken care of is not all devoted to rental, but is divided between company and city in proportion to respective investments the city's investment being in the leased transit facilities, the company's investment being the capital stock outstanding on its old system, amounting to \$30,000,000 (dividends not included in item 3 of prior deductions above). Each party gets not more than 5 per cent on this investment. Out of any balance remaining after this 5 per cent distribution, but not before, the city may be paid any additional amounts needed to meet its full interest and sinking fund charges on its transit facilities. All other disbursements have priority. Furthermore, payments under the first five items of deductions are cumulative and must be paid in full after any period of deficiency, and thereafter the distribution of current net revenue between city and company takes precedence over deferred payments under item 6 and the final rental payments to the city.

Reference has already been made to the option which the city has of withdrawing from certification and rental requirements, any part or all of its transit facilities, so that fares may not be unduly increased thereby. The terms of this Philadelphia lease embody a broad recognition of the principle that a city as a whole may need improved transit facilities which the patrons of the facilities should not pay for in full. The removal of surface railway traffic from the streets is of substantial benefit to many business interests which must still use the streets. Rapid transit definitely enhances suburban

real estate values. It is not unfair that some of these interests affected should, temporarily at least, bear a portion of the rapid transit burden. In the case of suburban real estate, an increase in assessed valuation in proportion to the increase in market value, and the application of the resulting increase in taxes or its equivalent to the charges on rapid transit facilities, would materially lessen the increased cost of transit service.

The provisions in the recent Chicago draft, covering the lease of the city's projected subways, do not show the same liberality as found in the Philadelphia lease. The company is required to pay 6 per cent on the new money which the city invests in its subway system, the payment for each section of the system beginning immediately upon its being placed in service. The investment upon which this return is paid naturally does not include the expenditures made from the large fund accumulated from the city's 55 per cent of the net revenues of the surface lines under the 1907 franchises.

The only possible relief from the payment of this rental is through the right granted to the city, within lawful limits, to assess all or any part of the cost of subways upon private property specifically benefited thereby. This may be done only by special ordinance in each case, and the exercise of the right, with its probable attendant litigation, is doubtful. In the case of deficiencies in gross revenue, the only payments having priority over the city rentals are operating expenses and reserves, taxes and fixed charges on prior obligations.

It is apparent that the 6 per cent charged for rental is not cost. It is probably much more than cost, for the usual sinking fund should not be necessary as the lessee undertakes to "maintain, repair and renew" the entire subway system throughout its indeterminate lease. Combined interest and sinking fund charges on the Boston subways are less than 5 per cent, so that Chicago is apparently anticipating a profit from its subway leases.

5. Return on Capital Value

The simplest form in which return on the investment can appear as an element in cost of service is a fixed, straight percentage on capital value. None of the service-at-cost franchises has this simplicity. The nearest approach to it is found in Cleveland and Des Moines, where actual, existing fixed charges are allowed on funded indebtedness and 6 per cent on the remainder of capital value, represented by stock and floating debt. This means a variable average return as the proportions of indebtedness and stock change. In Cleveland, bonds bearing 5 per cent interest have gradually been retired and replaced by 6 per cent stock. The market value of this stock has remained appreciably above par since 1911, when the franchise was amended to increase its security.

Slight modifications of this general plan are found in the Boston, Bay State and Massachusetts acts. Actual fixed charges, either existing or future, are provided for in all these acts and, in addition, fixed rates of return upon stock investments. The Boston act authorizes a \$3,000,000 issue of preferred stock paying 7 per cent dividends, and an ultimate return upon present or future common stock of 6 per cent. During the first five years the return on the common is less, being 5 per cent during the first half of that period and 5½ per cent

during the remainder of the period. The Bay State and Massachusetts acts provide for 6 per cent uniformly upon capital stock investment.

The Chicago consolidated basis of return is somewhat similar. Fixed charges of 5 per cent are allowed upon prior obligations of the old companies (not to exceed 60 per cent of the total capital value) and 8 per cent is allowed on the balance of the capital value until 1932, with 7 per cent thereafter.

The Philadelphia franchise allows actual fixed charges upon prior obligations, and actual charges and dividend requirements upon all new capital issued under authority of the supervisor. Dividends upon the prior capital of \$30,000,000 are to be paid at the rate of 5 per cent if and when the city is paid a similar return upon its investment in new transit facilities. These payments are cumulative.

All the above grants accept the rates of return fixed or to be fixed by investors for secured loans. The grants themselves fix the return upon unsecured investments. The difference in most cases is 1 per cent. Theoret-

SINCE the passing of the horse cars, the operation of the street railways has imposed no material added burdens upon pavements but they have continued to pay a large proportion of the cost. Hundreds of miles of streets have been paved solely because of the car tracks therein, and the street car revenues have been steadily decreased by the resulting encouragement to vehicular traffic.

ically, there is the same assurance of return for both classes of investment under the service-at-cost plan during the life of the franchise. Under an indeterminate franchise (or a term franchise with obligations of renewal or purchase) with satisfactory terms of purchase, the theoretical difference in security of principal is small. There is, however, in the minds of investors a practical, material difference. It may be worthy of note that in one service-at-cost city, the Mayor not long ago in all seriousness proposed that the guaranteed return of 6 per cent to stockholders be reduced to 4 per cent during the continuance of war prices, so that an increase in fares, then materially less than 5 cents, might be avoided.

There is grave doubt, in view of recent radical changes in investment conditions and the improbability of return to the former more stable conditions, if it is now possible to fix an equitable return upon long-term investments. If the return becomes too low, the investment field is restricted; if too high, the cost of service becomes excessive. This condition is recognized in the most recent franchise draft in this class, that in Cincinnati, in which the actual cost of all new money invested under the franchise is allowed. In this franchise the class of securities, the normal rate of return thereon, their amortization provisions, the price at which they are sold and other pertinent conditions are all subject to the approval of both the local supervisor and the State Utilities Commission. The prevailing return upon prior securities is maintained. In this way, investors, public,

company and any other parties concerned are protected.

The sliding scale principle, well known among English utilities but used to only a very limited extent in this country, is embodied in one of the railway franchises included herein. The Dallas grant has a sliding scale of return on the capital value in connection with the fare schedule already stated. When the highest authorized rate of fare is in effect, the return is fixed at 7 per cent. When the next lower rate is adopted, the return becomes 8 per cent. For each of the lower rates included in the schedule an additional one-half of 1 per cent is allowed. This gives a maximum possible return of 9 per cent, but the probability of this rate

getting only one-third. The initial \$6,300,000 surplus is to be used in amortizing intangible elements in the capital value already referred to through the addition of uncanceled extensions and betterments up to that aggregate amount. The city may use its share of the subsequent surplus to finance additions to the property with a view to ultimate purchase, to reduce the capital value, to reduce fares, or, by popular vote, for other public purposes. If fares are reduced, the railway's share of the surplus which would otherwise be accumulated must not be impaired, that is, the reduction must be made exclusively from the city's share of the surplus. The city's share in the surplus has so far amounted to only about \$100,000.

The Cincinnati grant contains a combination of profit-sharing and sliding-scale principles. It provides for actual fixed charges on prior obligations, a fixed sum return on certain prior capital, and actual fixed charges and dividends upon all new securities issued in accordance with the new franchise. The company also shares in varying proportions in any surplus that may be accumulated. When the rate of fare is 5 cents or less the company's share is 45 per cent; when the fare is 5½ cents, the share is reduced to 30 per cent; when the fare is 6 cents, the share becomes 20 per cent; if the fare goes above 6 cents, the company gets no part of the surplus.

The Montreal grant allows a 6 per cent normal return upon capital value. Upon new capital furnished by investors during the war or within two years after its termination, an additional 1 per cent is allowed, but this supplementary return is wholly withdrawn within five years after the war. The railway also receives a further return to the extent of 20 per cent of the divisible surplus, the balance of the surplus going to the city (30 per cent) and the tolls reduction fund (50 per cent). There is no restriction upon the use of the city or company allotments. The purposes of the tolls reduction fund have already been explained. The company is not permitted to pay dividends on its stock in excess of 10 per cent.

This grant also provides for two supplementary allow-

being earned is quite remote unless there is a very radical change from present conditions.

The sliding scale principle has the advantage under stable conditions that it encourages efficiency of operation. However, with such a radical increase in operating costs as has taken place since the Dallas franchise became effective, a higher fare, logically necessary, involves a lower return to the investor and at a time when money is commanding materially higher rates, the investor therefore being subject to a double injustice. The reverse condition of a higher return with a lower fare resulting from business stagnation is equally open to criticism. The results of this application in Dallas of the sliding scale to a railway situation will be watched with interest, but satisfactory working is not to be expected under present unstable conditions. It will probably also be found that the fare and return steps contained in this franchise are too large for stability. Alternate up and down changes at the prescribed minimum intervals of six months are to be expected if the fares ever get below the maximum rate.

The remaining franchises in this group embody the profit-sharing principle of return. Supplementing a minimum fixed return on the capital value, there is a division of surplus earnings between railway and city. This method was first adopted in the Chicago surface franchises, which allow a return of 5 per cent upon the capital value plus 45 per cent of the surplus. Fifty-five per cent of the surplus goes to the city to be used ultimately for the construction of rapid transit facilities. As shown in Table II, the city's share of the surplus during the ten full years of operation of these franchises ending in 1917 amounted to slightly more than \$20,000,000.

The Kansas City arrangement is somewhat similar, but the railway gets a 6 per cent return upon the capital value without any distributable share in the surplus until it has amounted to \$6,300,000. Further surplus is divided between railway and city, the railway

TABLE II—CHICAGO SURFACE RAILWAYS

Statement of City's Share (55 Per Cent) of Surplus from Operation Under 1907 Franchises

1908	\$1,564,618 47
1909	1,386,877 96
1910	1,276,252 65
1911	1,705,550 30
1912	1,870,908 00
1913	2,529,992 26
1914	3,002,453 16
1915	2,558,383 63
1916	1,665,710 34
1917	2,746,988 99
	\$20,307,735 76

TABLE III—THE CLEVELAND RAILWAY COMPANY

Operating Expenses Less Maintenance and Total Cost of Service Under Taylor Ordinance, Actual and Allowances, Per Car-Mile

	Operating Expense—		Total Cost—	
	Actual	Allowance	Actual	Cost—Allowance
1910	11 67	11 50	24 28	23 09
1911	12 07	12 50*	23 88	23 59
1912	12 19	11 50	23 09	22 57
1913	12 23	12 10*	24 72	24 10
1914	12 22	12 10	25 27	24 32
1915	12 56	12 60*	25 70	25 49
1916	14 00	13 50*	28 16	28 33
1917	15 34	14 50	29 75	29 52
1918		16 00*		
		19 50*		

*On and after May 1.

*On and after March 1.

*On and after Feb. 8.

*On and after Aug. 4.

ances, one of which is unique in franchise history. The first is a fixed annual sum, equivalent to one-half of 1 per cent of the initial capital value (\$181,431.47) for the expenses of new financing, including printing and engraving, legal and registration fees, listing, etc. Any unused part of this allowance must be kept intact with interest accretions until the termination of the franchise, when it may be distributed. This item of cost, where specifically provided for, is more commonly a

charge to capital value. In the Chicago surface franchises a fixed percentage is allowed on the cost of all capital additions for this and other overhead costs. In Philadelphia the actual financing costs are included in capital value.

The unique allowance in the Montreal grant is an "operating allowance," an amount equal to one-eighth of 1 per cent of the current capital value, awarded to the railway annually if the actual operating expenses are within the amount per car-mile fixed by the supervisor as already explained, or do not exceed this amount by more than 2½ per cent, or, if exceeding it by a greater percentage, such greater excess is on account of abnormal conditions not within the control of the railway and certified as such by the supervisor. If the excess is not so certified, the railway receives no operating profit, and any expenses in excess of the allowance plus the margin of 2½ per cent thereof, less the one-eighth of 1 per cent of capital value otherwise allowed as an operating profit, must be made up from the railway's own resources.

The purpose of this operating allowance is distinctly commendable. It sets up each year a specific standard of operating efficiency in the light of conditions then existing, not those which a score of years before were thought might exist. If the standard is met by sustained vigilance, a deserved reward is made. If this vigilance is relaxed and extravagance is permitted, not only is the reward lost but the railway must pay the bill from its own pocket. The possible objections to such an allowance are obvious. The standard operating expense must be fixed with unvarying, scrupulous fairness and honesty, and in the light of sustained, intimate knowledge of operating conditions and requirements. Otherwise, either injustice is done the public, or the railway becomes discouraged in its efforts to maintain maximum efficiency. A tendency might develop to recognize past earnest but unsuccessful attempts of the railway to secure its reward by liberality in fixing a future standard of expense, or on the other hand past indifference on the part of the railway might suggest a relatively low standard. It would be difficult to decide if or when such tendencies were beyond the intent of the franchise in establishing this policy of reward. The whole scheme has needed and attractive possibilities, and its actual workings will be watched with interest.

6. Amortization

A large proportion of the mortgages upon electric railway property contain sinking fund or improvement fund provisions under which the outstanding indebtedness thereunder is gradually reduced, or the amount of property subject to a given indebtedness is gradually increased. The annual requirements for such funds, usually from 1 per cent to 2 per cent of the bonds outstanding or certified, are taken from gross income and are a part of the cost of the service rendered. The railways operating under the franchises herein considered are not exempt from this general practice. Several of them have supplementary amortization provisions which show special conceptions of the meaning or distribution of the cost of service.

The earliest of these franchises is that in Kansas City. The initial capital value in this case, as already

noted, contained an item of \$6,300,000 for intangible elements such as development cost and franchise value. It was decided that these elements should not be a permanent factor in the cost of service. To the extent that they represented the value of the surrendered old franchises, they should be wiped out by 1925, when they would have expired. To the extent that they represented unrecovered early losses, the necessity for

TABLE IV—CHARACTERISTICS OF SURPLUS RESERVES, THE FARE "BAROMETERS" IN SERVICE-AT-COST FRANCHISES

City	Normal Amount of Reserve Dollars	Per Cent of Capital Value	Range of Upper and Lower Limits	
			Dollars Between Limits	Per Cent of Either Limit from Norma
Cleveland	\$500,000		\$400,000	40
Dallas	575,000 ¹	8		50
Montreal			1,200,000 to 2,700,000	
Philadelphia			2,500,000	
Cincinnati	400,000		400,000 ²	62.5
Boston	1,000,000		600,000	37.5
Bay State	500,000		300,000	30
Massachusetts		6 to 12 ³		50
Chicago (recons.)	2,000,000		1,000,000 ²	50 ⁴

¹ Approximate initial amount.

² Below normal only, upward range not specified.

³ \$250,000 above normal; \$150,000 below normal; all other specified ranges are divided equally above and below normal.

⁴ Per cent of annual revenue.

amortization is not as clear. There is no unanimity of opinion as to how, if ever, early losses should be made up by regulated public utilities. In competitive business the problem is comparatively simple. The regulated utility may take care of its inevitable early losses in one of three ways: (1) By maintaining abnormally high rates during a definite succeeding more profitable period; (2) by never recovering the losses themselves but indefinitely earning interest thereon; (3) by gradually but not regularly charging off the losses from the profits of supernormal periods, together with a return on the unamortized balance. The first method involves injustice to the patrons of the period involved. The second method is not unjust to any patrons and is economically sound, but meets with a surprising amount of opposition—instinctive, political and otherwise. The third method, confessedly a compromise, is practical if not scientifically correct. The Kansas City franchise adopts this method. The entire surplus income, to the extent of the initial \$6,300,000 accumulation, is to be used by the railway for uncanceled extensions and betterments, thereby gradually substituting tangible in place of intangible property, until the latter is eliminated. The rate of substitution depends upon the profitability of the business.

The city may, if it sees fit, carry this amortization program further by applying its share of the surplus beyond the initial \$6,300,000 to further uncanceled extensions and betterments, or to reductions of capital value, thus decreasing the unit cost of the service. This program was predicated upon a profitable 5-cent fare.

The Philadelphia grant embodies no new amortization features other than a sinking fund on the city's transit facilities, presumably sufficiently large to retire the entire investment within a reasonable term of years. It confirms, however, an unusual amortization feature in the 1907 franchise by which a fund is to be accumulated to retire the entire issue of stock then outstanding at the expiration of that franchise, the city then becoming the owner of the property. There is no

provision in the new franchise by which this amortization can be suspended other than temporarily. Clearly such proceeding burdens the present generation of patrons with a part of the cost of serving the succeeding generation.

The Chicago consolidated franchise contains the remaining amortization feature of interest. Five years after the effective date of the ordinance, the company must begin to accumulate such a fund. For the first five years thereafter, accrual is at the rate of one-quarter of 1 per cent of the capital value; for the next five years it is at one-half of 1 per cent; for the next five years it is three-quarters of 1 per cent; and after the end of the initial twenty years the rate of 1 per cent applies. Under the operation of this final fixed 1 per cent there must be no diminution in the amount of annual accrual although the capital value may decrease. This fund may be used for retirement of outstanding obligations or to pay for uncanceled extensions and betterments, the effect in either case being to reduce the capital per unit of property. If this franchise were to continue in operation for about fifty years with the amortization annuity in scheduled effect, the equivalent of the original capital value would have been wholly retired, a large proportion of the annual cost of subsequent additions to property, financed through the amortization fund, would be uncanceled, and the cost of service would be appreciably reduced. The then existing situation may be expressed mathematically if certain average assumptions are made. At the end of n years, with an annual increase of r per cent, the capital value would be $(1 + r)^n$ times the initial capital value. If $n = 50$ and $r = 5$ per cent, the capital value at the end of fifty years would be 11.47 times the initial capital value. The portion of capital retired through amortization would be 1.00/11.47 or nearly 9 per cent. If it is further assumed that one-sixth of the subsequent additions to property are financed through the amortization fund and therefore uncanceled, it appears that between 15 per cent and 20 per cent of the total subsequent capitalization is not subject to regular capital charges. If these charges would otherwise be 40 per cent of the annual revenue, the reduction in revenue thereby becomes 6 per cent to 8 per cent. This reduction is partly but not wholly offset by the objectionable amortization annuity itself. To the extent that it is not offset, the patrons of early years contribute to the cost of the service in later years.

7. Surplus and Reserves

The final item in the cost of service, after the initial accumulation of the required surplus and sundry reserves, is negligible in the average year, including only such increases in these accounts as may be required by increased volume of business. In any particular year there may be an addition to the reserves from operating revenues if a deficiency exists, or a withdrawal if current revenues are insufficient to meet current expenses and charges. The methods and limitations of such procedure are more specifically described in a following section.

SUMMARY AND DISCUSSION OF COST ELEMENTS

The different elements of service cost as set forth herein may here be reviewed and useful conclusions

drawn from their treatment in the different franchises.

1. A fixed allowance for operating expenses, changeable only by action of a City Council, is not practicable. An annual budget, prepared in the light of expected conditions, is much better as a means of checking actual operations and as a possible basis of reward for operating efficiency.

2. A minimum allowance for maintenance and replacements such as is commonly found is quite important, preferably one accrual for the combination. It should be materially in excess of current requirements unless the property has reached a maturity and stability unusual among street railways. There should be a limit to the accumulation of unused accruals. Although gross revenue is not a scientific basis of accruals and total reserve, it has definite practical advantages, particularly if the percentages of gross revenue are automatically adjusted to the prosperity of the business.

3. Taxes should be limited to the usual assessments upon commercial property. There should be no franchise or gross earning taxes.

4. Rentals of transit facilities should be limited to actual cost to the lessor. If rapid transit facilities are leased from the city, a provision for abatement of rentals when and to the extent that the traffic cannot properly bear the burden is to be commended.

5. The return upon capital should not be wholly fixed because the future normal return cannot be foreseen. Actual interest and amortization should be allowed upon indebtedness. A substantial proportion of preferred stock, bearing a fixed return, may well be authorized. The final equity, represented by common stock, should have a return varying with general business conditions or with efficiency of operation, or both. Without this last incentive to sustained alertness, stagnation will result. None of the franchises here reviewed has an ideal provision for an equitable return to investors. A share in the surplus, added to a fixed return, is commendable but may fail to accomplish its purpose under abnormal business conditions. The same objection applies to the sliding scale of rates and return. Within limits, the operating profit plan is thoroughly good. It might be improved by making it proportional to operating efficiency instead of being fixed. By combinations or amplifications of such methods, there should be assured to the holders of the final equity such an increase in their minimum return as will secure a degree of efficiency and progressiveness approaching that found in unregulated private business. Such incentives would involve no increase in ultimate cost of service. It would, among other things, tend to reduce the base rate of return.

6. There should be no amortization of capital as far as it relates to tangible property. There is no equitable ground for amortization of intangible elements of value representing the usual initial losses, but this may be permissible to a limited extent in times of prosperity when fares are not above normal. No noticeable burdens should be imposed for this purpose.

7. No further comment is necessary regarding surplus except to urge that no excessive accumulations be made from revenue, particularly when large reserves are available for specific purposes. This is particularly true of new franchises which go into effect during the prevalence of war prices.

COMPARISON OF REQUIREMENTS FOR RESERVE FUNDS

All service-at-cost franchises seek to avoid frequent or large changes in fare by the use of sundry reserve accounts. The number and interrelation of these accounts is bewildering, at first sight at least, in some cases. In other cases extreme simplicity is found. The purpose in all cases is the equalization above stated, but the effect in some cases is to increase present burdens for the relief of the future. If present reserves, created from revenue, are unnecessarily large and are invested at low rates of return, the patron, indirectly getting the benefit of such return, becomes an involuntary investor in the railway instead of having an opportunity of finding a more attractive investment elsewhere.

A reserve for depreciation or replacements is required in all these franchises. In some cases, as already stated, maintenance and renewals are not distinguished, both being provided for in the reserve. The Montreal

A reserve for depreciation or replacements is required in all these franchises. In some cases, as already stated, maintenance and renewals are not distinguished, both being provided for in the reserve. The Montreal franchise fixes the appropriations to and the normal accumulation in the reserve. The Chicago (surface and consolidated), Cleveland and Kansas City franchises fix the rate of accruals but not the normal accumulation in the reserve. The accumulated reserve in Dallas is limited to a percentage of property value, varying as already stated. The Philadelphia accruals are not fixed other than that the rate for the city's transit facilities shall not exceed one-half of 1 per cent per annum. The method of accrual and amount of the reserve in the case of the remaining franchises are not fixed in advance. Judgment as to adequacy rests with the supervisor except in the case of Cincinnati, where the utilities commission will fix the procedure after an initial period of five years.

A reserve for accidents is provided in most cases; it is specifically excluded only in the case of Cleveland where a board of arbitration decided that such a supplement to the so-called "interest fund" was not contemplated in the ordinance. In Dallas the accrual to the reserve is initially fixed at 6 per cent of the gross revenue, with provision for any necessary change. In other cases, rate of accrual and extent of the reserve are left to the judgment of the supervisor.

The Montreal franchise provides for two special funds not found in other grants. The railway must build up from its own resources a guarantee fund of \$500,000 from which to pay excess, unauthorized expenses, any penalties imposed by the city, and otherwise to insure the performance of franchise obligations. The fund must be deposited in an approved, accessible place and income from it belongs to the railway. To the extent that the interest upon money borrowed for this fund exceeds the income derived from it, a burden is imposed

directly upon the company and indirectly upon its patrons which does not seem warranted by the practical advantages derived therefrom. The city is not without other adequate means of enforcing fulfillment of obligations, and excess expenses might be deducted from the company's share of the divisible surplus or otherwise made up by the company as it might see fit.

This same franchise also sets up a contingent reserve fund of another \$500,000, by accruals from gross revenue not exceeding 1 per cent thereof per annum as an equalizing fund, but not having the fare-adjusting functions usually attaching to this fund. This contingent fund may be drawn upon to make good deficiencies in revenue and is restored as soon as sufficient revenues are available. We now come to the fund common to and a salient feature of all the modern franchises of this type, the index or barometer which determines fare changes, variously named interest fund, reserve fund, surplus reserve, emergency fund, etc., and herein called the surplus reserve.

In general, this fund has a designated normal value,

a lower limit at which fares must be increased and an upper limit at which fares must be reduced. Where specific reserves for replacements, accidents, etc., are set up, it is usually provided that the upper limit of the surplus reserve shall not be reached until all these subsidiary reserves are normal, brought up if necessary by appropriations from the surplus reserve. Unless otherwise stated in the following outline of the special characteristics of the various surplus reserves, the funds therein

THE terms of this Philadelphia lease embody a broad recognition of the principle that a city as a whole may need improved transit facilities which the patrons of the facilities should not pay for in full. The removal of surface railway traffic from the streets is of substantial benefit to many business interests which must still use the streets. Rapid transit definitely enhances suburban real estate values. It is not unfair that some of these interests affected should, temporarily at least, bear a portion of the rapid transit burden. In the case of suburban real estate, an increase in assessed valuation in proportion to the increase in market value, and the application of the resulting increase in taxes or its equivalent to the charges on rapid transit facilities, would materially lessen the increased cost of transit service.

are capitalized and not accumulated from revenue.

The Cleveland normal reserve is \$500,000 with upper and lower limits of \$700,000 and \$300,000 respectively. There is no direct relation between the surplus reserve and the replacement reserve accumulation. There is now an enormous deficit in the replacement reserve, or would be if all appropriate charges had been made to it rather than to special suspense accounts. If the surplus reserve were used, as it should be, to make up this deficit, the present balance would be reduced by more than \$2,000,000, possibly to \$3,000,000 less than normal.

The Dallas franchise sets up from revenues a surplus reserve which is normal at 8 per cent of the current capital value. If, when the subsidiary reserves are not less than normal, the surplus reserve accumulates to 50 per cent above normal, fares must be reduced to the next lower step in the schedule. If, after six months' operation under the reduced fare, the subsidiary reserves are normal and the surplus reserve is still 30 per cent or more above normal, another fare reduction must be made. Further decreases may be similarly made until the reserve does not exceed normal by more than 10 per cent. It is, however, stipulated

that no fare reductions shall be made until the full return authorized by the franchise shall have been paid cumulatively from the effective date of the grant.

If, under any rate of fare, the surplus reserve falls to 50 per cent of normal, the fare must be raised to the next step. If the reserve does not rise to 80 per cent of normal within six months under the operation of this higher fare, another increase may be made, and further increases may similarly follow until the reserve is not more than 10 per cent below normal. Thereafter no further increases may be made until the reserve has again fallen to 50 per cent of normal.

When the surplus reserve is in excess of normal by more than 10 per cent, and either subsidiary reserve is below normal, the railway must transfer to such reserve such amounts as are necessary to bring them up to normal, or such lesser amounts as will still leave the surplus reserve 10 per cent above normal. The noteworthy thing about this general plan is the relation of the surplus reserve to capital value, by which the reserve automatically increases as the property and business grow. This has a definite advantage over a fixed reserve which gradually grows smaller in proportion to the volume of business.

In the Montreal grant the so-called "tolls reduction fund" created from revenue performs in part the immediate functions of the surplus reserve. The operation of this fund has already been explained, and it will be recalled that its upper limit is between \$1,000,000 and \$2,500,000 at the discretion of the supervisor. In case of deficiencies in revenue, involving a possible increase in fare, the contingent reserve fund is also a factor. If in any year the deficiencies are such as to reduce the contingent reserve to less than \$300,000, the deficiency therein and any in other subsidiary reserves must be made up from the tolls reduction fund. If this fund is thereby exhausted, fares must at once be raised to provide at least the prevailing full cost of service. So long as any balance remains in the tolls reduction fund no fare increase is necessary, for the contingent fund still remains. If the \$500,000 normal amount of the contingent fund were made the minimum limit for fare increase purposes of the tolls reduction fund, the complication of the combination of funds might have been avoided.

When the new Philadelphia franchise goes into effect, the surplus accumulated during the prior operation under the 1907 franchise will be set up on the books as an "initial surplus." Any surplus earned under the new grant will be separately accounted for as "new surplus." The combination of these two accounts becomes the surplus reserve. Whenever the new surplus has reached the sum of \$2,000,000 and has been increasing in substantial amounts during the two years preceding, and all costs of service have been met cumulatively, the rate of fare shall be reduced after approval of the utilities commission. Whenever, through increased cost or diminished revenue, the new surplus has become exhausted and the initial surplus has been drawn upon to the extent of \$500,000, a higher rate of fares shall be effective after approval of the utilities commission. This plan, without definitely fixing a normal surplus reserve, provides a zone of such reserve, with upper and lower limits \$2,500,000 apart, within which fares

shall be fixed but outside of which they shall change.

The Cincinnati franchise provides for a normal surplus reserve of \$400,000, of which \$250,000 is to be procured from the sale of securities, the balance of \$150,000 to be the entire initial surplus to that extent earned under the new franchise, beyond which amount the surplus is divided as already explained. Whenever after the normal surplus reserve has been created (which implies the full cumulative payment of all elements of service cost) it shall be increased by \$250,000 or 62½ per cent, the fares then in effect shall be decreased. If within two months after the reduction the reserve continues to increase, a second decrease may be made. Whenever after the normal surplus reserve has been created the amount in the reserve shall be reduced by \$150,000 or 37½ per cent, the fares shall be raised, and if after two months' use of the higher fares the reduction in reserve continues, another increase may then be made, and this process is continued until the reserve is restored. At the beginning of the franchise term, before the normal surplus reserve has been created, the fares may be increased from the initial tentative 5-cent rate if the results of two months' operation show that the revenue is insufficient to cover the cost of the service, and further increases may similarly be made at intervals of two months until the required revenues are obtained.

The Chicago consolidated grant provides for a surplus reserve of \$2,000,000. Fares must be increased if this reserve is drawn down to \$1,000,000 to make deficits good. The fare increase shall be calculated to restore the reserve to normal by the end of the following fiscal year. After the deficits have been made up fares may be reduced if, in the judgment of the trustees, a new deficit would not thereby be created. Fares may be decreased at other times if the accumulation in the reserve and the surplus receipts are "sufficient to justify it."

The Boston act requires the creation of a surplus reserve of \$1,000,000. If at the end of any calendar quarter ending June 30, 1919, or thereafter the reserve is 30 per cent above the initial normal amount, and the revenues for the preceding quarter have exceeded the cost of service, the fares shall be reduced within one month. If at the end of any quarter ending June 30, 1919, or thereafter the surplus reserve shall be below normal by more than 30 per cent, fares shall be increased within one month. If the surplus reserve shall be entirely exhausted on June 30, 1919, or semi-annual dates thereafter, or the balance is insufficient to meet existing deficiencies, the trustees may call upon the treasurer of the Commonwealth for funds to make up all accumulated deficits in accordance with the Massachusetts policy already outlined.

It is to be noted that, although June 30, 1919, is still in the future, two fare increases have already been made on the Boston Elevated system and others are under consideration to take care of large deficits, but no call has yet been made upon the State for aid. It is reported, however, that the trustees will shortly recommend that the State purchase from the company its part of the subway system, and relieve the company of all charges upon the entire publicly-owned rapid transit facilities used by the company.

The Bay State act fixes the amount of the normal surplus reserve at \$500,000 and the upper and lower limits, beyond which fares shall be changed under procedure similar to that in the Boston act, at 50 per cent from the normal.

The Massachusetts act fixes the reserve less definitely, in per cent of the capital value, but establishes the upper and lower limits 30 per cent from normal, with procedure in fare increases similar to the other acts already mentioned.

A review of these various reserve programs shows unanimity in favor of accumulations for replacements, and nearly the same agreement in favor of an accident reserve. There is also a fare index fund where varying fares are contemplated. In connection with the upper and lower limits of such funds, fixed to indicate the need of a change in fare, attention is directed to the stipulation in a few cases that fares shall be changed when these limits are reached only if there has been a general upward or downward tendency in surplus revenues for a considerable period of time in the direction confirming the need of the fare change. The two-year tendency period fixed in Philadelphia may be too long, but the application of the principle will tend to prevent needless fluctuations in fares at times of brief especially good or bad business conditions. Other special funds or reserves, found in a few cases, apparently serve no essential purposes and might be eliminated for simplicity by slightly modifying the functions or characteristics of those universally employed.

Several diagrams are shown on page 17, illustrating the relation between reserves, current operating revenues and service costs. These diagrams set forth more clearly than descriptive text the direction of flow of available funds from revenue to divisible surplus, the interrelation of revenue, costs and reserves, and existing priorities in disbursements.

PENALTIES

Little needs to be said with respect to the penalties which may be imposed under these franchises for violation of their terms, with the exception of two which have unique provisions. These penalties are in the form of a reduction in return upon capital value not exceeding 1 per cent for any and all offenses. In both the Cleveland and Dallas grants the application of such severe measures is limited to matters submitted to arbitration and to violation of decisions with respect thereto. The board of arbitration determines the amount of the penalty (within the limit fixed) in Cleveland, and its duration, coinciding with the violation of the decision, in both Cleveland and Dallas.

GENERAL PROVISIONS

Most of these franchises do not differ from older forms of grants with respect to the various general terms and conditions usually considered essential in such cases. There should be a noticeable difference in

certain matters from the public point of view. Where the public is paying the costs of service, it should be careful that it does not set up extravagant standards or provisions, such as special types of track construction, iron poles exclusively, power plants, carhouses and other extensive buildings upon expensive city real estate, etc. Provisions that cars shall seat not less than forty passengers and be operated by two men are inconsistent with the latest developments for efficient service. On the other hand, an agreement that the city may call upon the railway to clean and water occupied streets at bare cost plus 10 per cent when traffic will not be impeded, is quite consistent with the fundamental intent of these grants.

A wise provision in this or any other form of franchise is that which permits the cancellation of any specific requirement or feature found to be unlawful

THE advantages of unlimited life, in avoiding amortization of investment in excess of adequate provisions for depreciation, and in not discouraging improvements and extensions at any period, are too obvious to need elaboration.

without disturbing the rest of the grant, provided the matter in question is not an essential one or was not a controlling one or material inducement to the making of the agreement. In the matter of extensions of lines and service, aside from certain initial or minimum requirements, a commendable policy is embodied in a number of these grants to the effect that extensions into new territory will not be required when their operation would impair the present of future ability of the railway to earn a reasonable (or specified) return upon its property as a whole. Other than for such restrictions, the cities may order any new facilities that appear to be needed. Ability to finance the necessary expenditures upon reasonable terms is a further limitation found in a few cases.

Arbitration of disputes in the conventional way is permitted in nearly all cases, but there is a noticeable tendency to restrict the scope of arbitration, leaving many matters to the decision of the supervisor, and others, on appeal to the state utilities commission. In Philadelphia, all matters in dispute are referred to the regular supervisory board, having a member representing each side and a neutral member. This plan has an advantage over the ordinary arbitration board in that at least two of the members are intimately acquainted with the matter at issue and are no more biased than the usual party members in arbitration.

MUNICIPAL PURCHASE

The right of the city to purchase the railway property under service-at-cost franchises is included in all such grants so far in effect, although it does not appear to be an essential element in those not of indeterminate form. This right is limited as to time in several cases—Dallas, after ten years; Philadelphia, after July 1, 1927; Montreal, on March 24, 1953, and at five-year intervals thereafter. In the other cases the right may be exercised at any time after reasonable notice, usually fixed at six months.

The price to be paid in nearly all cases is based upon the capital value with sundry allowances and

adjustments described below. In Cincinnati, the city reserves the alternative right to proceed under the State law and pay a "just compensation." In Montreal, the purchase price is to be fixed by arbitration, it being stipulated that the capital value shall not be conclusive evidence in such proceeding. There appears to be no logical reason for this last departure from the usual practice. If the initial capital value was fairly determined and additions thereto and deductions therefrom are all properly handled, and if the return to the investors throughout the life of the grant is no more nor no less than fair, involving no return to them of principal (all of which is insured by the terms of the grant) the appraised value should not differ from the then capital value except possibly for an item appearing in another franchise, the value of future rights of participation in divisible profits. With the exceptionally long initial immunity from city purchase fixed in the Montreal franchise, this value should be negligible.

In all cases the property purchased includes funds created for replacements, damages, etc. Adjustments are of course required where these funds have been invested in the property. Where indebtedness is assumed by the purchaser, it must also be deducted from capital value. The disposition of cash and current assets and liabilities is in accordance with usual commercial practice.

A percentage premium is stipulated in several of the purchase provisions. In Cleveland the city must pay 10 per cent in excess of the capital value less any indebtedness assumed. This premium is not paid if purchase occurs after the expiration of the original term. Dallas must pay 5 per cent in excess of the capital value plus an additional 5 per cent upon that part of it representing additions to the property during the preceding ten years. Kansas City may take over its railway without premium payment when its share of surplus income invested in the property amounts to 50 per cent of the capital value. If the property is taken before this 50 per cent has accumulated it must also pay the company "the value of the remainder of its rights to participation" and the cost of redeeming outstanding bonds.

The percentage premiums above stated may be considered as compensation for terminated profits, for retirement of obligations and other liquidation costs, for amortization of financing costs and other intangible assets not included in capital value, etc. Where such purchase allowance does not appear, a compensating substitute is sometimes found in the form of a cumulative payment of any deficits in return from the date the franchise becomes effective to the date of sale. Where the return is an undivided fixed one this does not apply, but the following applications in other cases are noteworthy.

The Philadelphia franchise requires the city to pay, on purchase, any deficiencies in past dividends on either new or old stock. The Cincinnati franchise requires the city to pay all past deficiencies in operating cost and return to investors, together with interest on any money borrowed to finance deficiencies. The Chicago consolidated franchise apparently has the equivalent of this guarantee against final deficiencies, as it clearly states that the various items of service cost, including

interest and dividends, shall be cumulative. The Dallas franchise states that any balance remaining in the surplus reserve at the time of purchase by the city may be applied to the payment of the full return authorized for the rates of fare from time to time in effect. Apparently during the first year of operation under this franchise no surplus was accumulated, for the total earned return was materially less than the 5 per cent minimum allowed before the surplus receives any credits.

An alternative purchase provision is contained in the Chicago surface, Cleveland and Dallas franchises under which the city may designate another purchaser than itself. The purpose of this provision is to secure better terms under private operation than the original grant contains. In Cleveland this is accomplished through reduction in the rate of return, the purchaser being required to accept a rate at least one-quarter of 1 per cent lower than the rate in effect. No provision of this kind is embodied in the other grants, so that the advantage of the so-called licensee clause is not apparent except as a club over the holder of the franchise. The purchaser or licensee in Dallas must pay a 5 per cent higher premium than the city on that part of the capital value applicable to property more than ten years old.

The practices above outlined indicate that the right of purchase should be retained by the city, preferably for its own exercise alone, and that the purchase price should be the adjusted capital value, with a percentage bonus if the property may be taken at any time. There are advantages in an initial period of undisturbed private operation, followed by the right to purchase at stated intervals with a gradually decreasing bonus.

The purchase should include the entire property whether or not within the city limits, unless the outside property is of such size and independent patronage that it may be satisfactorily operated as a separate unit. If partial purchase is permitted, a stipulation for severance damages should be made. The provision in some of the franchises, that any deficiencies in return below the authorized standard rate, which may be possible during operations thereunder, shall be fully made up and paid as an addition to the purchase price, should be of universal application.

CONCLUSIONS

Of the twelve ordinances or legislative acts herein considered, providing for service-at-cost, one has been in use for nearly twelve years. Eight have been in effect or submitted for approval within a period of little more than a year. All of the eight provide for automatically variable fares, while three of the four older ones do not. All of the recent eight also provide for some flexibility in return to investors, whereas in two of the older ones such flexibility is largely lacking. In only one of the recent franchises is a newly established capital value noticeably diminished for depreciation, but two of the earlier four values were largely depreciated. Public management, through trustees, is established in three of the recent drafts but in none of the older ones. A return of about 6 per cent is the maximum contemplated in most of the older grants. Seven per cent is authorized on certain issues among

the new ones, with 9 per cent as a maximum limit in one case, the average being appreciably higher than in the former cases.

The above fragmentary summary shows definite, progressive tendencies in service-at-cost features, partly based on experience, but largely due to development in economic thought applicable to such problems. The tendencies now in evidence will undoubtedly continue and future franchises of this class will show increasing departure from earlier methods, particularly in the direction of increasing flexibility in the various necessary standards by which service and financial matters are measured.

WHAT CONSTITUTES A LOGICAL FRANCHISE?

It may be appropriate, in closing, to supplement the various scattered comments and criticisms contained herein by a very brief statement of the writer's conception of the logical outcome of the present tendencies in service-at-cost franchises. To that end, the characteristics which the essential features herein discussed may well embody in new drafts in the not distant future are here given in very brief outline.

The accompanying outline is not intended as the foundation for a model franchise. It is merely a statement of facts and tendencies with respect to a few of the many features which modern franchises contain.

Those not considered herein have, to a large extent, become standardized. Many of them might safely be omitted in these days of state and municipal supervision. The features herein considered are still far from standardization. The most striking general tendency in that direction is in matter of flexibility. The earliest service-at-cost franchises were far too rigid and unadaptable. The later forms have not yet tested their improvements in this respect, but it is, nevertheless, confidently expected that their success will encourage further advances in the same direction.

Nothing has so far been said about freedom from competition under service-at-cost operation, because it is not a prominent, expressed feature of the franchises discussed. One of them specifically states that it is not an exclusive grant, and the laws of many states prohibit monopolies. On the other hand, an increasing number of states are providing specifically for exclusive public service under indeterminate rights. Service at cost means, fundamentally, adequate, comprehensive transportation with the lowest possible charges consistent with permanence of service, security of investment and regularity of return to investors. Freedom from competition is economically essential to both minimum cost and maximum security under public regulation, and should be provided for in some effective manner in all service-at-cost franchises.

Essential Features of a Modern Franchise

As Outlined by MR. NASH

TERM: Indeterminate.

CAPITAL VALUE: Cash investment, if accurately or approximately determinable, or cost of reproduction without deduction for depreciation.

SUPERVISION: A single supervisor, independent and technically trained, for all except quite large properties; for the latter, a board of three, representing city, company and state, the last named preferably appointed by the utilities commission. Appeal from supervisor or board to state commission on the more important matters. Extend scope of supervision if necessary to avoid public operation.

FRANCHISE TAXES: None should be imposed. Paving and other similar burdens which are equivalent to such taxes should be abolished.

PUBLIC CONTRIBUTIONS: Railways should be permitted to receive community assist-

ance from taxation authorized by state when necessary to maintain essential service. Relief should not be wholly limited to present war period.

FARE SCHEDULES: Franchises should not embody any fixed fare schedules or limits. These should be left to the supervisor, with confirmation by the utilities commission. Schedule steps should be published in advance, and fare changes should be automatic, small and as infrequent as possible through adequate reserve funds.

COST OF SERVICE: The cost elements should include (1) actual operating expenses, if reasonable; (2) an accrual for maintenance and replacements, usually in excess of current requirements, unexpended portions to be accumulated; (3) actual taxes on the usual commercial basis; (4) return on investment made

up of actual interest and sinking fund requirements, a minimum assured return upon remaining capital, a part or all of which should also participate in surplus earnings and possibly in special rewards for efficiency.

RESERVES: Should include an adequate but not excessive reserve for depreciation, an accident reserve and a fund or reserve for contingencies and automatic fare regulation. One regulating fund should be sufficient if its limits are carefully defined and applied with suitable reference to current revenue tendencies.

MUNICIPAL PURCHASE: The right of the city, but no other party, to purchase at any time all, but not less than all, the railway property at its then capital value plus a percentage premium if purchase is made early in the franchise life.

The Fuel Administration and the Skip Stop

How the Federal Government and the Electric Railways Co-operated in Several Ways to Save Fuel, with Special Reference to Eliminating Unnecessary Stops

By J. F. LAYNG

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WHEN the United States Fuel Administration was created the electric railways wished to do all in their power to save fuel and to work in harmony with the new governmental organization. To facilitate this movement the American Electric Railway Association appointed a joint traffic and engineering committee, with J. P. Barnes, general manager Schenectady Railway, as chairman, and L. H. Palmer, assistant to the president United Railways & Electric Company of Baltimore; G. H. Kelsay, superintendent of power Union Traction Company of Indiana; M. B. Lambert, assistant manager railway department Westinghouse Electric & Manufacturing Company, and the writer as members.

The joint committee compiled information for use on posters which were sent out by the Fuel Administration to the railway companies. These posters were as listed below:

Poster No. 1, entitled "Uncle Sam Needs that Extra Shovelful," showing Uncle Sam (silhouetted) at the fireman's elbow. This poster was designed to impel the fireman to save coal. Poster No. 2. An "Uncle Sam" poster, which showed his face with a severe expression. It was addressed to the carhouse men, and listed the several elements which would influence power consumption from a car maintenance standpoint.

Poster No. 3. The "Eagle" poster, the appeal of which was directed to the conductors and motormen. It illustrated the ways in which they could help in the saving of power.

Poster No. 4. A car card designed to be placed in the car advertising racks, containing the statement that the motormen and conductors of the car were members of the United States Fuel Administration.

POSSIBILITIES OF THE SKIP STOP WERE EARLY FORESEEN

During March, 1918, it was realized that by using the skip-stop system of operation in the large cities of the country great fuel economies could be realized. In order to start the skip-stop campaign properly the Fuel Administration, on recommendation of the War Board of the American Electric Railway Association,



J. F. LAYNG

Mr. Layng has divided his active career between the manufacturing and railway operating fields. For a time he was with the Westinghouse Company, beginning with the apprentice course, and served in several engineering departments. For six years he has been engaged in general consulting work for the General Electric Company, the last three years having been devoted to a study of electric railway operating economies. A most important article on this subject written by him appeared in the 1918 statistical issue of this paper. During the last few months Mr. Layng has been doing special work for the Fuel Administration.

recommended it for use in the national capital. John A. Beeler, consulting engineer, carried out the War Board's suggestion, and he proceeded at once to adapt the skip-stop principle to local conditions in Washington. The result has been covered in several articles in the ELECTRIC RAILWAY JOURNAL.

For the purpose of following up the work that was done for the Fuel Administration in Washington an engineer on the Administration's staff was assigned to the duty of requesting the general adoption of the skip-stop system in car operation in the cities of the country, and a part of his duty was to see that proper information for this purpose was supplied.

The promulgation of the system was continued, city by city, up to the latter part of August, by which time practically one-third of the cities in the United States had adopted the skip-stop method of operation. Entire states, such as Massachusetts, Connecticut, New Jersey, Pennsylvania, Texas and Tennessee, adopted the system in all principal cities. The favor with which the plan was received prompted the Fuel Administration to issue a general request that all cities in the United States having populations of 25,000 or more should adopt the skip-stop system. This was done in the belief that annual fuel savings in excess of 1,500,000 tons would thus be secured. This request met with a most gratifying response. Mayors of cities and many others wrote commending the Fuel Administration for taking the initiative in the matter. This result was the more significant when we consider that in the elimination of stops the electric railways are changing the habits of a generation. The result of the campaign has been that car schedules have been "speeded up" and, speaking generally, 10 per cent or more of the time which passengers would otherwise have had to spend on the cars has been saved.

One of the problems confronting the Fuel Administration was properly to present to those who had the guidance of electric railway properties the urgency of the need for installing the skip-stop system. For this purpose a number of bulletins were prepared and copies were sent to all state fuel administrators working under the federal Fuel Administration, to public service

commissioners, to mayors, to city councilmen, and to electric railway officials. To secure the co-operation of the American Electric Railway Association War Board, the Fuel Administration appealed to this body, by letter, and asked it to use its influence to insure the proper carrying out of the administration's request. The War Board reproduced this letter in its bulletin No. 29, dated Aug. 29, 1918, which was sent to all electric railways. The substance of the important bulletins issued by the Fuel Administration is reproduced on the following pages.

Entirely aside from the question of power saving, the Fuel Administration used its influence to see that the skip-stop system was installed in the different

Another fact is that when cars can deliver passengers to their destination in less time the population of a city is more evenly distributed. This factor, together with that of the reduction in running time of 10 per cent or more, greatly enhances real estate values in a community. These items are mentioned to illustrate the advantages which can be obtained in electric railway operation through the skip-stop system without additional investment.

AN ILLUSTRATION FROM CHICAGO

Many people prefer the skip-stop system even when there is not a time saving to be made. This is illustrated by service which is given on the South Side

Gentlemen
The UNITED STATES needs your help!

Be a fighting member of the fireman's army! You are boss of the coal pile and your fight is to save the coal to help the boys "over there." Your work is part of the war work of the country. Everything you save, especially coal, can be used somewhere else, to save and protect lives and preserve liberty.

HOW YOU CAN HELP

- Inspect, adjust, and oil carefully. Properly adjusted and smooth running cars save power.
- Turn off compressors and lights in idle cars. Do not burn lights or run shop and other motors except when necessary. Power used here is utterly thrown away.
- Keep brakes clear of wheels. There is no worse power thief on the railroad than a dragging brakeshoe.
- Reduce car shifting to the absolutely necessary movements only.
- Reduce coal used for heating by keeping shop and car doors shut.

UNCLE SAM NEEDS THAT EXTRA SHOVELFUL

I WANT YOU TO SAVE COAL

Every shovelful you save may preserve a soldier's life.

Use less fuel per ft. by the Electric Railway to save a million tons of coal during 1918. The reason saved one pound of power has been found elsewhere. It will give us more useful electricity tomorrow.

HERE'S HOW TO SAVE:

1. Tighten up loose nuts.
2. Tighten up loose bolts.
3. Wash the boiler clean.
4. Keep the fire doors shut.
5. Close your engine room.
6. Turn the water off.
7. Turn the steam off.
8. Turn the air off.
9. Turn the oil off.
10. Turn the gas off.
11. Turn the oil off.
12. Turn the gas off.
13. Turn the oil off.
14. Turn the gas off.
15. Turn the oil off.
16. Turn the gas off.
17. Turn the oil off.
18. Turn the gas off.
19. Turn the oil off.
20. Turn the gas off.

Be a fighting member of the fireman's army! You are boss of the coal pile and your fight is to save the coal to help the boys "over there!"

APPROVED BY

UNITED STATES FUEL ADMINISTRATION

TWO EFFECTIVE "UNCLE SAM" POSTERS DESIGNED TO INDUCE CAREFUL FIRING

cities of the country because this principle of operation was known to be economically sound. Saving of time in transportation means a very great deal in connection with community growth. Providing that we have means of rapid transit it is possible for us to live at greater distances from our places of occupation than would otherwise be possible. We can thus raise our children in suburban homes rather than in city flats. Rapid transit economizes the time of the daily car rider and renders available for him a certain extra amount of time which he can spend either at his place of business or at his home. The amount of time which can be saved to the entire body of citizens of the country in this way in the aggregate amounts to a considerable total. The inconvenience to passengers which is occasioned by the relocation of stops is much more than balanced by the saving in time.

lines of the Chicago Elevated Railroads. Over a portion of these lines three tracks are employed, one of which is used during the rush hours exclusively for one-way express traffic. On the other two tracks both local and express trains are operated. The "locals" on these two tracks naturally limit the running time of the express trains, but many passengers transfer from the locals to the express trains to secure a ride free from the continual starting and stopping of the trains.

The total time saved in any community by using the skip-stop system is enormous. For example, let us assume that with the old arrangement eleven stops were made per mile, the stops thus being 480 ft. apart. The greatest increase in any walk possible, as affected by stop locations, is then 240 ft. On this basis the average passenger would walk 120 ft. each at the beginning and end of his ride, a total of 240 ft. Walking

at a rate of 5 ft. per second he would require forty-eight seconds to cover this distance.

If we assume that the stops on a whole system, including business, residential and suburban districts, would average seven per mile, or 754 ft. apart, and making our calculations on the same basis, the average walking time, thus revised, would be 75.4 seconds. The net loss in time due to the relocation of stops would be 27.4 seconds. On a transportation system carrying 300,000,000 passengers annually the total extra walking time per year would be about 2,210,000 hours.

Assuming further that the average length of the lines on this system is 9 miles and that the schedule speed of operation is 9 m.h.p., and assuming further that the use of the skip-stop system will reduce the running time by 10 per cent, there will be a time saving per trip of six minutes. Then half of this time, three minutes, would be saved to the average passenger. A total of 300,000,000 passengers would thus enjoy an annual saving of 15,000,000 hours.

Deducting the lost time due to the extra walking, there remains the enormous time saving of 12,790,000 hours which, even at the nominal value of 20 cents per hour, is worth \$2,558,000 per year. Time conservation is an important element in the continuance of our country's prosperity, and saving of car riders' time is a part of this conservation.

SKIP-STOP SYSTEM WAS WIDELY ADOPTED

It is interesting to note that approximately 95 per cent of all the cities in the United States which were appealed to in the skip-stop campaign adopted the system. Of these a few will possibly abandon it temporarily, but as the plan is economically sound and greatly promotes community growth the cities which do abandon it will be handicapped in competition with their rivals.

The writer takes this opportunity to acknowledge the enthusiasm and cordiality with which assistance was given to the Fuel Administration by all those appealed to. Railway, administrative bodies, and the public generally pulled together in a "win the war" spirit to assist in saving fuel.

Exhibit I

LETTER TO STATE FUEL ADMINISTRATORS

Skip-stop service, effecting large savings of fuel, has been adopted in many communities. The actual saving in power when skip-stop service is adopted in a city varies from 8 to 16 per cent. Therefore, as a conservation measure during the war, the skip-stop system is of urgent importance.

Moreover, the skip-stop service on our street railway systems means a large saving of the time of the car riders. The same service can be given with less cars or, in other words, more service can be given with the same cars. In these times when all the available man-power is needed for war purposes, anything which we can do to conserve fuel and man-power is a patriotic service.

To put the system into effect, we shall mail, from Washington, bulletin number 2882, addressed to public service commissioners, mayors, city councilmen, city commissioners and street railway officials. The bulletin states the objects which the conservation division of the United States Fuel Administration desires to accomplish and requests that the system be put into operation in every city of 25,000 and over.

From Washington we shall send to the railway companies instructions showing how the skip-stop service should be inaugurated. These directions have been followed in many cities and have been effective. Additional sets of the instructions will be sent on request.

Posters are being printed which can be placed in every railway car used for city and suburban operation. This poster reads:

Support the Skip Stop

It will save 1,500,000 tons of coal per year.
More coal means more steel.
More steel means more guns and ammunition.
More guns and ammunition, a shorter war and fewer casualties.

UNITED STATES FUEL ADMINISTRATION.

The posters will be sent directly from Washington to the street railway companies, who will be notified by letter that the posters are being forwarded.

It is extremely desirable to have the skip-stop service in operation before bad weather begins. If this system is started when weather conditions are good, the public will learn the advantages of the system before thinking of the disadvantages which will naturally come with adverse weather conditions.

Many cities have already put the skip-stop system into operation. We are sending copies of our request even to these cities, in order that they may understand the general scope and progress of the work.

Because the situation is urgent, we suggest that you make a personal appeal as Fuel Administrator of the State for the skip-stop system to be started on Sept. 15, 1918. This date has been selected as the proper time to have the system started in all cities of our country.

In some cases, power to operate railways is secured from hydroelectric plants, and it might seem that these should, therefore, not be taken into consideration. However, in practically every instance, it will be found that steam plants are supplementing the hydroelectric supply, and any saving of power that can be made will come from the steam plant supply. In this way, all the power saved by skip stops will mean fuel savings.

The work of Fuel Administrators, committees and their various associates has shown gratifying results in securing the adoption of skip-stop service. It is desirable that all those who have contributed to the success of the movement, follow up the actual operation and continue to give the railway companies the benefit of their counsel. In this way, maximum fuel saving will be obtained and most efficient service rendered.

Yours very truly,

UNITED STATES FUEL ADMINISTRATION.

Exhibit II

LETTER TO PUBLIC SERVICE COMMISSIONERS, MAYORS, CITY COUNCILMEN, CITY COMMISSIONERS AND STREET RAILWAY OFFICIALS

As a fuel conservation measure during the war, all cities having a population of 25,000 and over are requested to have their street railways operate the skip-stop system and also to regulate car heating and car lighting so as to secure the minimum power consumption.

The power required for starting a car is six or eight times as great as that required to keep it in motion. A considerable part of the power for operating street cars is due to the frequent stops which the cars make. A partial list of the states and cities where the skip-stop system has been adopted is indicated below:

California:	Massachusetts:	Ohio:
Berkeley	All cities	Cincinnati
Alameda	Maryland:	Columbus
Los Angeles	Baltimore	Dayton
San Diego	Michigan:	Toledo
Connecticut:	Detroit	Pennsylvania
All cities	Grand Rapids	All cities
District of Columbia	Minnesota:	Rhode Island:
Delaware:	Minneapolis	Providence
Wilmington	St. Paul	Woonsocket
Illinois:	Missouri:	Newport
Chicago	Kansas City	South Carolina:
Indiana:	New Jersey:	Charleston
Indianapolis	All cities	Texas:
Evansville	New York:	All cities
Port Wayne	Brooklyn	Tennessee:
South Bend	Rochester	All cities
Iowa:	Syracuse	Virginia:
Des Moines	Schenectady	Norfolk
Kentucky:	Albany	Richmond
Louisville		Portsmouth
Louisiana:		
New Orleans		

Annual savings at the points which we have mentioned total more than 500,000 tons of fuel, all of which can be devoted to war purposes. When all cities in the United States have adopted the skip-stop system, the total annual

THE Motorman and Conductor of this car are members of the **U.S. FUEL ADMINISTRATION** and they are pledged to save Electricity, which means **COAL**

WAR BOARD AMERICAN ELECTRIC RAILWAY ASSOCIATION



CAR CARD IDENTIFYING CREW WITH COAL CONSERVATION MOVEMENT

savings will be at least 1,500,000 tons. The skip-stop system not only brings about this saving in fuel at a time when our nation is facing a dangerous fuel shortage, but it also brings about an actual improvement of the service of the street railway companies. The elimination of stops enables the street cars to move their passengers to their destination more rapidly and with more comfort. For instance, in Minneapolis the length of a forty-minute car trip has been reduced to twenty-five minutes. In Washington, a trip that was formerly forty-seven and one-half minutes has been reduced to forty-two minutes.

The skip-stop system does not contemplate putting stops so far apart as to be unduly burdensome. The Fuel Administration has requested that there should not be more than eight stops per mile (average 880 ft. apart) in business districts; six stops per mile (average 880 ft. apart) in residence districts; and four stops per mile (averaging 1320 ft. apart) in open country.

Before starting the skip-stop system it is suggested that a board consisting of five members be selected; two representing the city, two the railway and the fifth a representative of the Fuel Administration. The city members should obtain the views of the police and fire departments regarding dangerous points of traffic, providing they exist. The duty of this board is to select the car stops and see that instructions regarding the stop marking advertising and general policy are carried out that the public may be given the best service with maximum fuel economy.

After the skip-stop system has been started, requests are often made to have stops restored. Great care should be selected in the elimination of stops by the committee and it should be remembered that if stops cut out are restored, we do not have the skip-stop service. The committee selecting stops are requested, therefore, to make their surveys carefully before an announcement of the stops is made.

The United States Fuel Administration desires the adoption of this system by voluntary co-operation of public service commissions, municipal authorities, city commissions and street railways. Since the actual fuel saving is so great in the aggregate, every citizen who is a car user will desire to have a part in this saving and to use his influence to effect the maximum saving.

All mayors and those in authority are urged to have ordinances passed to keep vehicles off car tracks and keep the tracks clear of obstructions. In this way traffic will be accelerated and much time saved for the community. These extra stops waste power.

It is also well to have the railway management and the city authorities make every effort to eliminate all stops on cars going up hill and around curves. Every effort should be made to see that stops at these points are reduced to the absolute minimum as excessive power is required for this operation.

It is desirable to reduce the heating on the street cars. Approximately one-sixth of the operating fuel during the winter months is consumed in heating cars. In this war emergency the Fuel Administration desires that this heating be eliminated, except in very cold weather, and then only sufficient heating be used to take off the chill. In many cases cars have two points of heat, and it is suggested in these cases that the heaters be connected in series. Local municipal authorities and the railway companies are requested to work together on this and reduce the power consumption used for heat to a point that will be reason-

able and not endanger public health or cause actual discomfort.

All municipal authorities are urged to do everything they can to reduce the number of stops made by the interurban cars, especially within city limits. In a number of cities ordinances require these large cars, or in some cases, trains, to stop at a number of street intersections. These large cars require three to four times more power to start than do city cars of moderate size.

Yours very truly,
UNITED STATES FUEL ADMINISTRATION.

Exhibit III

LETTER TO ELECTRIC RAILWAY COMPANIES

In order to save fuel, the United States Fuel Administration has advocated the use of the skip-stop system on all electric railways in cities of 25,000 population and over.

To have the public understand the problem and give us their support, we are sending you a number of posters which read:

Support the Skip Stop

It will save 1,500,000 tons of coal per year.
More coal means more steel.
More steel means more guns and ammunition.
More guns and ammunition, a shorter war and fewer casualties.

UNITED STATES FUEL ADMINISTRATION.

We request that you paste these posters in some conspicuous place in all passenger cars operating in city service. The United States Fuel Administration requests you to give this your personal attention and to see that the skip-stop service is operated so as to give satisfaction to the public. By so doing you will be rendering a patriotic service.

Yours very truly,
UNITED STATES FUEL ADMINISTRATION.

Exhibit IV

SUGGESTIONS TO BE CONSIDERED IN ADOPTING THE SKIP-STOP SYSTEM IN ORDER THAT MAXIMUM FUEL SAVING AND REASONABLE IMPROVEMENT IN SERVICE MAY BE OBTAINED

In adopting the skip-stop system as a fuel-saving measure during the war, there are three fundamental principles which must be observed in order that the proper results may be assured. These are as follows:

A. The system must be applied to the entire city, including the business district as well as the residence district, and not merely to the latter.

Conductors
THE PUBLIC'S
Motormen

the UNITED STATES needs YOUR help.
Be a fighting member of the firemen's army! You are boss of the coal pile and your fight is to save the coal to help the boys "over there."

HOW YOU CAN HELP

1. Get up to speed as fast and smoothly as safety and comfort of passengers will permit.
2. Coasting saves coal. Shut off controller and coast as far as possible before applying brakes.
3. It is seldom necessary to use current on down grades.
4. Bring car to a stop as quickly and smoothly as comfort of passengers will allow. With air brakes best results are usually had by making but one sufficiently strong application of air and then coasting off.
5. Use judgment, when a vehicle is just ahead, and let car roll instead of feeding up controller.
6. Avoid skidding wheels. Avoid fanning air. Heavier air applications can be used at high speeds than at low speeds.
7. Save coal by economizing on light and heat.
8. The conductor's cooperation with the motorman in handling bell cord and passengers will mean getting the cars over the road with the least consumption of current.

CAR POSTER TO REMIND CREW OF MEANS AVAILABLE FOR SAVING ENERGY

B. The stopping points must be located so as to serve the people to the best advantage rather than to secure uniform spacing or to follow any arbitrary rule. This may bring some of the stopping points on the near side of the street, some on the far side, and some in the middle of a block. It is better, however, to have such a diversity, with the points properly located, than to have uniformity if convenience of location is sacrificed to secure this result.

C. The number of stopping points must not be too great. There should be not more than eight per mile (averaging 660 ft. apart) in business districts, six per mile (averaging 880 ft. apart) in residence districts and four per mile (averaging 1320 ft. apart) in the open country.

The remarkable improvement in the service which has been effected in Washington by the skip-stop system has been largely due to the proper observance of these principles.

In addition to the above, which may be regarded as fundamental, there are a number of other items which should be carefully considered in each case, but which, on account of local conditions, may or may not apply. These are:

1. If the system is inaugurated gradually instead of all at once, it is preferable to put it into effect first in the congested downtown districts where a number of lines converge and to make it apply to all of the lines in that district. This will effect an immediate improvement in service on all of the lines and will prepare the way for a greater improvement when the system is extended.

2. The stopping points should be plainly marked, preferably by signs bearing the words "Car Stop Entrance" or some similar designation which will be clear to anyone rather than merely by a colored stripe on the pole or other designation which is not self-explanatory.

3. There should be a sign in each car giving a list of the points at which stops are made, where this is practicable, or, where this is not practicable, calling attention to the fact that the car stops only at certain streets and suggesting that passengers and from the conductor the nearest stop to their destination.

4. Where lines diverge, the stopping points should be located so that the stopping of cars of one line will not hold back cars of the other line. A typical instance is where one line continues on a given street while a second line follows the same route for a portion of the distance and then turns into a side street. In such a case, if the cars of the first line stop in both directions beyond the point where the second line turns off and if the cars of the second line stop in both directions on the street which they alone use, the above object will be attained.

5. In many cases a staggered arrangement of stopping points, so that if the cars bound in one direction stop at First Street, Third Street, etc., those bound in the other direction will stop at Fourth Street, Second Street, etc., will distribute the advantages of the system in a more equitable manner among all of the patrons than an arrangement by which the cars stop at a given point in both directions and skip the next former stopping point entirely. There are other cases, however, where this arrangement is not practicable.

6. In connection with the introduction of the skip-stop system the matter of safety stops should be carefully reviewed. There are many points at which cars are now required to come to a standstill where equally safe operation can be obtained merely by having them slow down to a speed of 5 or 6 m.p.h.

7. Where interurban cars enter cities, it is desirable that they should not be required to stop at every car-stopping point (since such cars require much more power for starting than the city cars) but they should stop not oftener than every quarter mile. This can readily be arranged for by the use of special signs at the interurban car-stopping points.

8. By observing the above policies it is ordinarily possible, when introducing the skip-stop system, to reduce the number of stopping points on city lines by from 30 to 40 per cent. This usually reduces the number of stops actually made by about 25 per cent. Under these circumstances the schedule speed of the cars can, as a rule, be increased by from 10 to 12 per cent (without any increase in the maximum speed) while at the same time the power required (and hence the fuel) is reduced by a corresponding amount.

9. It has been more or less common, in introducing the skip-stop system, to begin with one or two lines and to reduce the stopping points only in the outlying sections, making all stops as usual in the business district. Such an arrangement does not give satisfactory results from the standpoint of either fuel economy or improvement in service. It is in the effort to avoid the introduction of the system on

such a basis in any future cases that we are calling especial attention to the above principles which it is necessary to follow in order to secure the desired results.

10. Where single track is operated it is suggested that every other corner be skipped; that is, assuming that the streets are numbered 1st, 2d, 3d, 4th, 5th and 6th, to have the stopping places shown at 1st, 3d and 5th streets. In this way, confusion with reference to the placing of stop signs will be eliminated. This will reduce confusion in knowing where the car stops are located.

11. All stops should be carefully marked. Where it is necessary to start the skip-stop system immediately and regular signs are not ready, in a number of cases temporary signs are used.

12. Previous to starting the skip-stop system the fullest publicity should be given to the established stopping places. This should appear in the daily papers supplemented by notices placed in the cars whenever practicable.

Exhibit V

BULLETIN NO. 29 OF THE AMERICAN ELECTRIC RAILWAY ASSOCIATION WAR BOARD ON SKIP-STOPS

The following letter has been received from the United States Fuel Administration regarding the operation and progress of the skip-stop system:

Washington, D. C., Aug. 29, 1918.

Mr. E. C. Faber, Manager,
American Electric Railway Association War Board,
950 Munsey Building,
Washington, D. C.

Dear Sir:

War's excessive coal demands increasing from day to day, require us to conserve fuel in every possible way. Practically all of the industries of the country are saving fuel. Electric railway skip-stop operation presents one of the largest fields for fuel savings. The Fuel Administration urges that skip-stop service be adopted in the United States in cities having a population of 25,000 or above. The fuel savings effected by this system will be at least 1,500,000 tons annually. We therefore request all electric railways to co-operate fully with the Fuel Administration in its efforts to save coal through the skip-stop system.

We are sending letters to the State Fuel Administrators, who will in turn communicate with the public service commissioners, mayors, city councilmen, and all others who regulate our public utilities, asking them to assist in putting the skip-stop system into effect Sept. 15, 1918.

Posters will be distributed to railway companies with instructions to insert them in prominent places in city cars. The posters contain a patriotic appeal to the public, asking them to support the skip-stop system, and explaining why it is an essential war measure.

Using the skip-stop system generally enables cars to be operated at 10 to 12 per cent higher schedule speed. The power saving varies from 8 to 16 per cent. Inasmuch as the cars operate at the higher schedule speed, it can be seen that the same service can be given with a lesser number of cars; or, providing the service warrants it, more service can be given with the same cars.

The importance of having the full co-operation of railway companies in making the skip-stop system a success in every city cannot be emphasized too strongly. This request from the United States Fuel Administration to the State Fuel Administrators and all public officials concerned, is merely to have the skip-stop system operative during the period of the war. The continuance of this economic method will in all probability depend upon the way the plan is carried out by the individual railway companies.

The railways and public officials are also being requested to eliminate stops on up-grades wherever it is at all practicable. These same officials are also being requested to eliminate all possible stops of interurban cars in cities, towns and villages.

We are addressing this letter to you as the representative of the electric railway industry. We expect the American Electric Railway Association War Board to aid in every way possible in securing the maximum fuel savings that are consistent with proper railway service.

We believe it is the patriotic duty of all railway men and of the individual members of the community to conserve fuel and man power by adopting the skip-stop system.

UNITED STATES FUEL ADMINISTRATION.

Electric Freight Haulage Is an Economic Duty

Such Service Is Invaluable to City and Country—The Field Is Practically Unlimited, and the Service Can Be Developed by Making a Traffic Analysis, Providing the Proper Equipment, "Selling the Product" and Using Farsightedness and Imagination

By A. B. COLE

Westinghouse Electric & Manufacturing Company

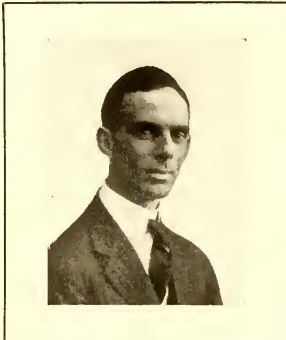
UNQUESTIONABLY it is the duty of electric railways to give the public the best possible service. Therefore, it would be well for them to look very carefully into the question of public demands and the profitableness of freight business.

Few lines would flatly say that it is profitable to handle freight. Most of them, however, would consider freight business profitable if they had "proper facilities," belts around cities and towns, freight houses, team tracks and steam road connections. In other words, they do not consider the business to be at present on a profitable basis, but they realize what is required to make it so. This entire view is somewhat pessimistic. Electric railways have a field entirely their own, and they are capable of giving service far superior to that of competitors.

The electric railway has done more than all other transportation agencies to improve social life among both city and country dwellers, but it has met only a part of its possibilities as a conveyor and distributor of natural and manufactured goods. The electric railway, in fact, is in a position to do more to place the produce of the farm at the door of the consumer with greater dispatch and less cost than can be done by any other means of transportation.

This closer co-operation with the farmer has been found profitable by many electric lines in more ways than one. For example, there is the good-will which now means so much to a utility, and the increase in tonnage that is bound to come with better crops and stock from more intensive and efficient operation. Through better transportation from the electric railway, the youth who formerly left the farm forever now hies himself off to the nearest agricultural college to become a modern farmer.

The modern electric railway brings the city to the front door of the farmer. There are thousands of farm dwellers who date the history of their success and prosperity from the day when the electric interurban first reached their territory. In the past it was the case of an early start with a two-horse team and a hard day's ride whenever it was necessary to get into the city for supplies or to the market. The advent of



A. B. COLE

Although but nine years out of college, Mr. Cole is well known in the electrical field through his surveys of railway freight conditions, and his recent work for the Electric Railway War Board during the past year. After graduating from Purdue University in 1909, he first acquired practical experience in the Westinghouse shops and engineering and sales departments, later working his way upward through several divisions of the same company's publicity organization. He is now assistant manager of that department, with headquarters at Pittsburgh.

the electric interurban changed all this. The farmer now at any hour of the day finds it possible to board a fast electric train for a trip of a few hours to the city. He can ship his produce into the city every day in the week if desired, instead of holding it for the weekly trip. He is in a position to take advantage of the market for his various commodities. His children are enabled to enjoy the educational and social advantages of the city and at the same time retain their residences on the farm.

The electric railway has also proved of immediate value in bringing the school to the farm by the use of special trains with competent lecturers and demonstrators. The subjects covered are usually dairying, horticulture, hog raising, poultry husbandry and farm management. Exhibits include dairy cows, hogs and other stock which are to prove the points made by the lecturers. The cars furnished by the railway operate on a fixed schedule, advance notice of the "Farm Special" being sent to every farmer in the interested territory, to all newspapers, commercial bodies and station agents. Generally, too, the merchants at towns along the way encourage the farmers to attend these "specials." The experts, who are drawn from the nearest schools, include specialists in everything from silos to eggs.

The producing character of some districts so visited has greatly changed because of profitable advice given and followed. Thus, one district was devoted almost entirely to grain. Through the educational talks, the farmers saw that dairying, hog raising, and fruit raising would be more desirable occupations, because of conditions peculiar to their territory.

In addition to the farm specials, electric railways which sell power have run "Electricity on the Farm" and "Home" specials to demonstrate the use of electrically-operated farm tools and electric lighting. Unfortunately, such practices have not been the rule. On many roads the freight business, like Topsy, "jes grewed" with no general policy of development that would bring out the uttermost possibilities of the territory.

The advantages arising from electric railway serv-

ice, however, do not lie solely with the farmers. The city dweller and the city merchant, for example, both profit by having the farm brought to their front door. The interurban railway brings in farm products fresh every day. They do not grow stale in transit but reach the city markets early the same day that they are shipped.

In general the electric railway is considered an advantage to the community. In many instances where electric railway service has been present the city merchants concede an increase of 10, 20 and 25 per cent in their business over a period of years, and in some cases the business has been of such noteworthy importance that it is only a question of time before the old cross-roads stores will go out of business, as the farmers prefer generally to trade in the larger towns. Moreover, the electric service allows the storekeepers in the smaller outlying towns to carry smaller stocks and thus not tie up so much capital.

Specimen comments regarding the value of the electric lines follow: "They build up the towns, but turn trade to the cities"; "They give cheaper freight and more consideration of rights of shippers"; "They benefit all trading centers, large towns from smaller, and small towns from farmers"; and "They gradually, but surely concentrate retail trade in the large cities."

ELECTRIC RAILWAYS ARE AT FAULT FOR UNPATRONIZED SERVICE

The electric railway excels in time of transit and in the handling of merchandise freight. In many instances cultivation by the railway traffic department and proper advertising, backed up by salesmanship, would soon make known the wonderful facilities of the electric railway as a freight carrier.

The problem before the electric railway in marketing its commodity is the same as that of a manufacturer who must break into the world market with a new product. He analyzes his field, and so must the electric railway in development of freight traffic. After proper analysis, the manufacturer launches an advertising campaign, backed by expert merchandising knowledge of the particular fields to be exploited. The electric railway must do likewise.

INTERURBAN LINES NEED AWAKENING

Despite the proved value of electric lines to the farmers and city dwellers alike, such carriers have not made full use of their opportunities for developing freight traffic. A railroad commissioner's view of the situation is summed up as follows:

Apparently interurban interests have never fully awakened to the possibilities of freight transportation. Their facilities are not commensurate with the opportunity, and the managements do not seem to have enough confidence in the future to provide for possible expansion.

The operation of single-unit trains is really an economic waste, in that it makes the unit cost of transportation a great deal higher than it should be. There is business in sight enough to justify multiple-unit trains in freight transportation on practically every interurban in the country—even though the bulk of the freight be not considered.

If the interurbans were to make a reasonably adequate effort to secure and handle bulk freight, the revenue derivable from freight transportation should be multiplied several times, as compared with present returns.

If the interurban railways do not soon awaken to the situation and provide more adequate facilities, it is among

the possibilities that they will lose a great deal of the possible business to the several trunk lines, because of the inadequacy of interurban transportation.

Surveys made by various bodies on account of the freight congestion and the delay of steam railroad movement of l.c.l. freight, show unquestionably that the interurban railways can be of good service to the country. They can relieve to a large extent the congestion of millions of tons of freight and thereby increase the car supply.

In its case the fields to be exploited are, to speak broadly, carload freight, less-than-carload freight, and parcel dispatch. All three of these divisions, of course, are subdivided depending on the kinds of industries touched.

To carry the merchandising parallel further, the manufacturer backs up his advertising campaign with expert salesmanship. In the case of the electric railway, these expert salesmen should be well-paid representatives of the traffic department under a high-grade, well-paid, experienced traffic manager. It is a well-known fact that the sales managers of first-class organizations are often the highest type of man in the personnel. This should be true in the case of a traffic officer, and in order to obtain such talent he must receive a salary commensurate with his ability.

Advertising and salesmanship of the manufacturer must be backed by its service from the main works; otherwise this expensive talent is wasted. The electric railway is in a position to give service superior to that of its competitors, barring none, but unfortunately the electric railway has failed to tell the public of this incomparable service. Electric railways are to blame for their unpatronized freight service.

ECONOMIC FALLACY OF THE MOTOR TRUCK

Motor-truck and electric railway facilities should be co-ordinated. The motor truck has practiced camouflage, and the electric railway stands by and permits this competitor to take the very cream of its traffic. Short-haul tonnage is now being hauled by motor truck—a traffic which really belongs to the electric railway, for the motor truck is economical over a very short distance comparatively. Yet the public has failed to recognize the true economic value of the electric railway. Why? Because the majority of electric railways when promoted are not backed by the proper imagination and far-sightedness, which in turn would demand the aggressive methods needed to make known to the public the merits of such an incomparable service.

So true is this that many chambers of commerce, boards of trade and other commercial bodies are helping to develop motor-truck haulage, failing to realize that this expensive system of transportation is entirely inadequate to meet the ultimate demands, while cheaper and better facilities—the electric railways—are available.

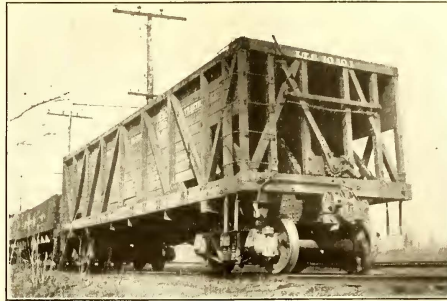
According to motor-truck promotion literature, the "star of the motor truck is only peeping above the economical horizon." The essential difference between the hauling of large volumes of freight by rail and similar volumes by motor trucks, it is said, is that in the first instance the rights-of-way represent private investments, while in the latter case the rights-of-way are public property. But even on this basis an analysis will prove the economic fallacy of the motor truck for freight haulage, in that with its unrestricted use, there could be nothing less than a maximum of waste in

man-power and maintenance—in additional men for up-keep of roads, in increased demand for repair parts and in gasoline needed for other industries. The winter of 1917-18 in many instances demonstrated the value of electric freight haulage. In some localities, where the weather was particularly severe, the electric railway showed its superiority by keeping traffic open and “delivering the goods,” when the steam roads and motor trucks were at a standstill. In one instance, the electric line not only took care of the local passenger service when the steam roads were tied up, but it hauled meat, milk, coal and other necessities to the towns within its territory, thereby saving the communities from serious inconvenience if not a real famine. This service will not soon be forgotten by the patrons. If electric roads can deliver the goods under such extreme conditions, it is obvious that they can more than make good under normal conditions.

STEAM AND ELECTRIC RATES NOT FAIRLY COMPARABLE

Having realized the folly of their original low rates, many electric railways have asked for, and occasionally secured, increased rates based upon the steam-railroad classifications. As a rule these electric lines have waited for the steam competitors to take the initiative. With regard to the broad principle of rate-making, however, the electric railways have rarely fought for a special classification based upon their superior service.

“Express service at freight rates” is an old slogan that has proved to be the downfall of many an interurban. With proper publicity, the public would pay the higher price that better service deserves. Such factors as early-morning delivery of overnight shipments and accessibility to stations entitles the electric railway to a differential wherever speed is the essence of the contract.

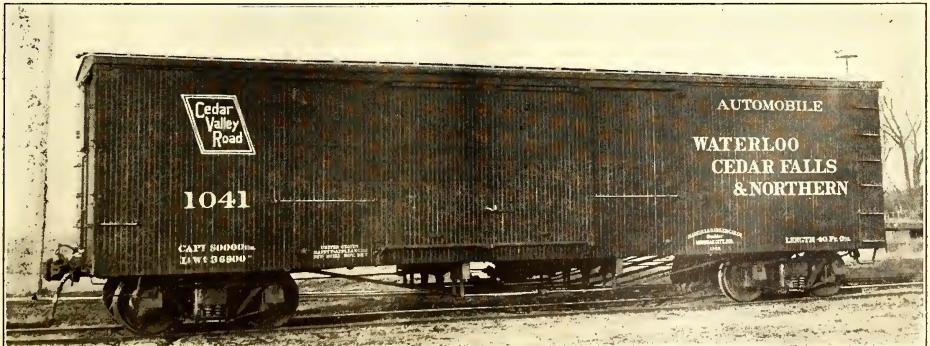


SPECIAL EQUIPMENT OF ILLINOIS TRACTION SYSTEM

Recent study has clearly disclosed the fact that both public utility commissions and chambers of commerce appreciate these inherent reasons for higher rates. In fact, they have stated that electric service is often worth at least 25 per cent more than steam service to the same destination. From this it would seem that if the railways developed more salesmanship in marketing their superior product of freight transportation, they could build up more business regardless of steam rates.

The field to which electric freight transportation may be offered is practically unlimited, and many lines now are engaged in an extensive business, accepting anything for transit that a steam line would. Noteworthy examples of this practice are the Waterloo, Cedar Rapids & Northern Railway, the Inter-Urban Railway of Des Moines, the Michigan Railway, the Toledo & Western R.R., the Fort Dodge, Des Moines & Southern Railroad and the Youngstown & Ohio River Railroad. There are also some roads which perform special service, such as industrial switching between steam roads and industries, while others handle primarily one principal commodity, such as coal. An example of the former type of road is the Niagara Junction Railway, and of the latter Bellville Electric Railway.

Moreover, there are other roads that are just breaking into the heavy haulage business, such as the Detroit United Railway, the Chicago, North Shore & Milwaukee Railroad and the Chicago, Lake Shore & South Bend Railway. All of the foregoing handle freight with electric locomotives and motor-freight cars. The heavy interurban roads are also found handling a tremendous tonnage, principally of merchandise both l.c.l. and c.l., and here we find solely motor-freight car and trailer operation with practically no steam railroad interchange. Notable examples of this type are the Ohio Electric Railway, the Union Traction Company of Indiana, the Northern Ohio Traction & Light



SPECIAL AUTOMOBILE CAR OF CEDAR VALLEY LINE

Company, the Cleveland, Southwestern & Columbus Railway, the Grand Rapids, Grand Haven & Muskegon Railway, the Pittsburgh, Harmony, Butler & New Castle Railway and the Terre Haute, Indianapolis & Eastern Traction Company. An embryo freight road, about ready to develop its territory, is found in the East St. Louis & Suburban Railway.

The commodities handled by electric lines may be divided into several general classes, as follows:

- Products of agriculture
- Products of animals
- Products of mines
- Products of forests
- Manufacturers
- Merchandise and other commodities
- Merchandise not included in the above

The term freight haulage does not necessarily apply to package freight or l.c.l. lots, as almost every interurban electric railway is doing a considerable amount of this business. What many electric lines have not fully developed is the handling of carload freight, which is the mainstay of the steam railroads. An example of what is possible on a 35-mile interurban line is shown from the following statement of commodities handled in one year:

Stone	816 cars	Pipe	21 cars
Coal	240 cars	Horses	20 cars
Hay	226 cars	Bolts	19 cars
Tomatoes	51 cars	Brick	18 cars
Tomato crates	46 cars	Tile	15 cars
Miscellaneous	42 cars	Lumber	11 cars
Wheat	27 cars	Milk	6 cars
Oats	22 cars		

The accompanying tables give further data of this sort. Table I shows the tonnage record by commodities

for the Salt Lake & Utah Railroad during 1917. Tables II and III give respectively specimen operating statistics of this railway for the month of February, 1917, and data showing the conditions of operation of this company.

HOW TO DEVELOP FREIGHT SERVICE

The interurban is no longer the proverbial "shoe string railway" that ran somewhere out into the country, but a well organized railway capable of rendering valuable economic service to its territory. While many lines were developed primarily for passenger business, some of these can readily help relieve traffic congestion and improve their load factors by hauling freight. To this end they should:

1. Make a traffic survey.
2. Develop dairy traffic handled by freight-motor cars.
3. Encourage merchandise shipments, handled in less than carloads or carload shipments by locomotives or motor cars and trailers.
4. Relieve steam railroads of local traffic.
5. Develop steam-railroad interchange.
6. Establish sidings and belt-lines, where possible, for industrial development.
7. Cultivate commercial bodies in their territory, and demonstrate the possibilities of electric service.

While freight haulage in its expanded form may call for the use of such special equipment as is shown by the accompanying illustrations of an automobile car on

TABLE I—TONNAGE OF COMMODITIES HANDLED BY SALT LAKE & UTAH RAILROAD DURING 1917

Commodity	January	February	March	April	May	June	July	August	September	October	November	December	Total	
Automobiles			37	23	25	23		5	6	6	10,881	6	138	
Berls	1,521	29		348	88				20	12,078	7,916	7,916	32,861	
Brick							63		20				103	
Building materials									82				82	
Canned goods	25		46		27				54	54	205	163	574	
Cans					23	25	12	49	63	34			206	
Cattle														
Cement			231	181	374	269	224	266	142	178	118		2,003	
Coal	490	783	885	504	683	637	664	1,240	4,367	3,371	1,173	4,085	18,822	
Coke				56		29		25		24			246	
Electrical supplies		15			15			15		15			75	
Explosives														
Fire clay		20		30				30	32				102	
Flour				20	37					49	25	67	228	
Fruit									2,914	591	133		3,638	
Grain		87	69	151	315	81	29	20	132	100	160	15	1,159	
Hay	12	91	217	227	43			19	121	68	23	220	1,041	
Limestone									36		100	283	419	
Lumber	362	137	219	459	478	1,152	688	787	556	250	100	289	5,488	
Machinery				23	33	720	80	70	70	70	6		282	
Merchandise	487	589	892	824	825	810	720	948	999	984	654	748	9,480	
Miscellaneous	30	100	37	12	124	105	139	41	227	231	99	46	1,191	
Ores										20			20	
Potatoes		198	98	112					18	613	272	105	1,416	
Rail				18	162	414	360	90	18				1,101	
Salt	75	57	88	47	41			23	45	49	50	31	506	
Steel				110	37	24		31	36	21			329	
Sugar	1,324	2,027	2,442	427	5	53	48	80	141	2,664	935	771	10,917	
Sewer pipe	27			7									34	
Ties		40	118	71	221	739	766	808	149	30	20		2,962	
Tile														
Track material							7		18				25	
Vehicles										282	272	142	215	911
Vegetables										40			30	726
Poles	227	114	50	34	68	40	103	20					33	
Cereal	15			18									88	
Corn	37	51											88	
Syrup	181	70	72		55				359	612	194	627	2,170	
Junk		21	36	139	80	62	42	65	58				502	
Iron pipe			188	79	8	6			38	35		44	390	
Wire		37	57	6	35				11				148	
Agricultural implements		30	39	115	28	33	22		13				280	
Slags				64				29	15				99	
Best seed				28						23		17	108	
Wagons				80	43	40				16	21	26	179	
Mill stuff		15	17										79	
Freight cars				162	60	12	12	12		220	21	26	466	
Boxes					55	49			36	24	15		179	
Spikes					66								66	
Horses							14						14	
Soda ash							58						58	
Silo								279	36				315	
Oil									17				17	
Shooks								110		29			139	
Baskets								80	59				139	
Asphalt										316	76		392	
Total	4,813	4,511	5,838	4,283	4,024	4,776	4,049	5,179	11,174	23,026	15,441	16,094	103,208	

the Waterloo, Cedar Falls & Northern Railway and a coal car of the Illinois Traction System, it requires only simple equipment to begin the handling of local freight. Many a road has started by using one or two freight motor cars, each able to haul three or four trailers. As business grew, one or two freight locomotives were secured. Motive power equipment is available which has such characteristics that operating an "off-peak" freight service would not necessarily require any additional substation, power house or feeder capacity or in anyway interfere with regular traffic. Low-speed field-control locomotive motors can handle heavy drags of freight cars with no greater power demands than those required by a single high-speed large interurban car.

One of the secrets of the rapid and extensive growth of freight business on some electric lines is that they have complete traffic arrangements with steam and electric connecting lines, and a well-organized method of securing business. Invariably, too, it is found that the electric railways which do the heaviest freight business usually have former steam railroad men in charge of this branch. With the nationalization of the steam railroads there should be available for re-employment some steam traffic men who could easily prove invaluable to

any electric railway which wants to build up its freight business. Such men not only know how to secure business and move traffic; they are also familiar with the complex practices peculiar to steam railroad interchange of traffic and equipment.

The disease of "localism," or deliberately building non-interchangeable equipment, must be cured if the electric railway wants to do more than a village business. In several instances it has been found that through a mistaken sense of standardization the policy of the mechanical department actually hindered the development of inter-line freight business. For example, because one property was using the same type of coupler on both passenger and freight cars it could not handle M. C. B.-equipped cars in interchange. Some roads discourage interchange because of their unwillingness to have their rolling stock travel on foreign electric lines, being quite devoid apparently of consideration for the meaning and the value of car interchange pooling practice.

These points, although small in themselves, are very important in connection with the development of electric freight on a large scale. It is neglect of points of this kind that causes steam railroads to fail to deliver a car at the designated place on the electric line, despite

TABLE II—SPECIMEN OPERATING STATISTICS OF SALT LAKE & UTAH RAILROAD FOR MONTH OF FEBRUARY, 1917

Freight Statistics	
Number of tons of freight carried earning revenue	4,511
Number of tons of freight carried one mile	72,020
Number of tons of freight carried one mile per mile of road	1,081
Average distance haul of one ton	15.9
Average amount received for each ton of freight	\$6 16874
Freight revenue per mile of road	\$65 61531
Freight revenue per train-mile	\$1 25430
Average revenue per car-mile	\$0 16678
Average number of tons of freight per loaded car-mile	5.1
Average number of freight cars per train-mile	5.1
Average number of loaded cars per train-mile	4.1
Average number of empty cars per train-mile	1.0
Average mileage operated during month	66.6
Average operating cost per ton per mile	\$0 16825
Average operating cost per freight train-mile	\$1 41090
Miscellaneous Statistics	
Revenue from transportation per car-mile	\$0 49535
Revenue from transportation per car-hour	\$8 40951
Revenue from transportation per train-mile	\$0 73523
Revenue from other railway operations per car-mile	\$0 00965
Revenue from other railway operations per car-hour	\$0 16685
Operating revenues per car-mile	\$0 50518
Operating revenues per car-hour	\$8 57534
Operating revenues per train-mile	\$0 74781
Operating revenues per mile of road	\$476 07702
Net operating revenues per car-mile	\$0 13012
Net operating revenues per car-hour	\$2 20909
Net operating revenues per train-mile	\$0 19262
Gross operating expenses per car-mile	\$0 38751
Gross operating expenses per car-hour	\$6 37877
Gross operating expenses per train-mile	\$0 57364
Gross operating expenses per mile of road	\$365 19099
Freight, mail and express car mileage	17,795
Freight, mail and express car-hours	852
Maintenance of way per mile of track	\$73.34
Average maintenance cost per passenger car	\$25.99
Average maintenance cost per passenger car-mile	\$4.16
Average maintenance cost per car of electric motive power	\$29.90
Station and terminal expense per passenger-mile	\$0 00083
Station and terminal expense per ton-mile	\$0 02509
Maintenance not dependent on train movement per mile of road	\$67.39
Per cent of freight revenue, loss and damage freight	0.01501
Passenger Statistics	
Regular fare passengers carried	52,396
Revenue transfer passengers carried	.....
Free transfer passengers carried	.....
Average number of passengers per car-mile	19.2
Average number of passengers per train-mile	22.2
Average number of passenger cars per train-mile	1.2
Revenue passengers carried 1 mile	862,072
Revenue passengers carried one mile per mile of road	12,944
Average distance each passenger carried	16.4
Average fare received from each passenger	\$0 39724
Average passenger train revenue per mile of road	\$312 52147
Average passenger-mile revenue	\$0 02416
Average passenger-mile operating costs	\$0 01317
Passenger car mileage	44,968
Passenger car-hours	6,745
Average operating cost per passenger car-mile	\$0 25248
Average operating cost per passenger train-mile	\$0 29177
Average passenger revenue per car-mile	\$0 46286
Average passenger revenue per train-mile	\$0 53486

TABLE III—DATA SHOWING OPERATING CONDITIONS OF SALT LAKE & UTAH RAILROAD

Utah-Idaho Sugar Company's Best Loading Platforms and Tracks:			
Granger	Harmon	Bello	Fifteenth South
Norberg	Redwood	Riverton	Bluffdale
Labi	Manila	Springville	Keeler
Salem			
Industries Served Through Connecting Lines:			
All industries in Salt Lake City and Provo, other than are reached directly by the tracks of the Salt Lake & Utah Railroad, are served through reciprocal switching agreements between this road and steam roads:			
Routes and Rates:			
Through routing and rates are in effect with all lines in connection with the Union Pacific System, thus giving the industries located on our tracks all the benefit of their rates and routing.			
Proportion of Intrastate and Interstate Freight Business:			
		750	
		(65 per cent intrastate and 35 per cent interstate)	
During the calendar year of 1917, the Salt Lake & Utah Railroad handled 1708 carloads moving on interline rates:			
		Carloads	
Coal		462	
Grain and hay		46	
Green fruit		294	
Lumber and forest products		231	
Potatoes		41	
Sugar and syrup		325	
Miscellaneous		311	
In addition to the carload interline business, more than 2,000,000 pounds of interline package freight was handled.			
For the same period, the handling of purely local freight, i. e., freight picked up and laid down along the line, approximated 1,500 carloads of local freight, and 18,000,000 pounds of less than carload freight.			
Passenger:			
No interline business.			
Freight Equipment:		Equipment Owned:	
			Tons Capacity
Three electric locomotives			60,000
Twenty-six box cars			100,000
Twenty all steel side dump gondola cars			80,000
Ten best cars			60,000
Seven flat cars			80,000
Four refrigerator cars			80,000
Two freight cabooses			.....
Passenger Equipment:			
Two all-steel motor express cars			
One all-steel trailer express cars			
Eleven all-steel combined express and passenger motor cars			
Four all-steel passenger coaches			
Men employed.....	143		
Fuel used.....		Hydroelectric power, purchased from the Utah Power & Light Company, and obtained by them from various mountain streams in Utah and Idaho.	

billing instructions and regardless of the inconvenience to the consignee. If electric railways wish to deal with the steam railroads, they must play according to the rules of the game.

CHOOSING THE PROPER FREIGHT ORGANIZATION

The quantity of business and the methods by which it is handled naturally control the size and the character of a freight traffic organization. While steam railroads have a fairly standardized freight department regardless of size, the electric railways of the United States, when viewed from the goods-handling standpoint, are divided into six different classes, as follows:

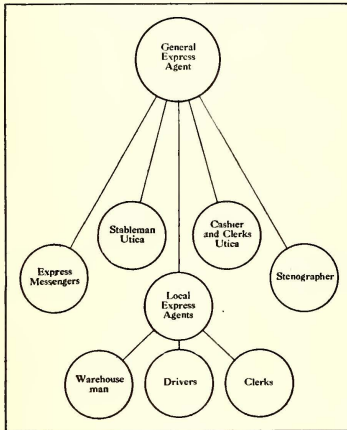
1. Purely passenger lines.
2. Lines over which an old-line express company operates on a percentage basis (usually 55 per cent of receipts) and offers a wagon collection and delivery service at rates slightly above those fixed by steam roads for straight rail transportation.
3. Lines which have entered into agreements to form a co-operative express package company organized and operated as a separate corporation with wagon collection and delivery service and with rates practically equal

Railway and the Toledo & Western Railway are examples. This class includes terminal, belt and switching lines, such as the Niagara Junction Railway, the Bush Terminal Railroad and the Hoboken Shore Road.

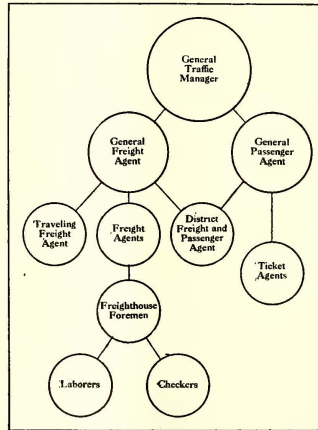
In each of the classes where freight or express is involved an entirely separate department with a special type of organization should be created. The accompanying organization charts are illustrative of methods now in use. The Detroit United Railway has heavy inter-urban l.c.l. freight traffic, while the Waterloo, Cedar Falls & Northern Railway has freight traffic similar to that under steam operation. The Aurora, Elgin & Chicago Railroad has a large amount of dispatch package freight, and the New York State Railways a considerable amount of pick-up and a large amount of parcel freight. The service on these two lines is more or less alike, the main difference lying in the rapid transit of the former.

HINTS FOR ORGANIZATION

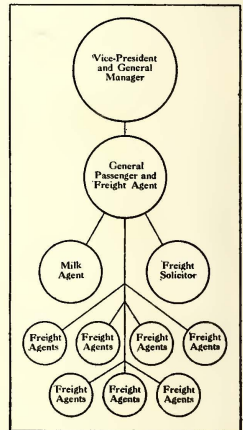
Where a line has been operating a strictly local freight and express, the ideal organization would include a general freight and passenger agent in charge of the



New York State Railways
Utica-Syracuse Lines



Detroit United Railway



Aurora, Elgin &
Chicago Railroad

ORGANIZATION CHARTS OF FREIGHT-HANDLING ROADS

to those of the old-line express company. For example, the Electric Package Express Company, Cleveland, Ohio.

4. Lines which operate less-than-carload freight business at steam railroad rates with a dispatch service at twice first-class steam rates, as for material within the 100-lb. limit and carried upon passenger cars.

5. Lines which operate a general freight and express business including both carload and less-than-carload shipments, with interchange relations, carrying through rates with steam roads, but exclusive of a through freight business.

6. Lines operating a general freight business on exactly the same basis as steam railroads, and considered practically as electrically operated steam railroads. The Piedmont & Northern Lines, the Fort Dodge, Des Moines & Southern Railroad, the Inter-Urban Railway of Des Moines, the Waterloo, Cedar Falls & Northern

securing of business and the general handling of material to and from cars. His duties are such that the freight business need not be separated from passenger business except in routine matters, and the latter may be handled by clerks. This official should be the court of last resort in all traffic matters, including the direction of all division agents, advertising, issuance of tariffs, etc. He should be in close touch with all industrial, commercial and trade organizations. He must also be familiar with such transportation as relates to the handling of regular and special trains. Through his acquaintance with shippers and the methods of billing and handling in transit, he can give excellent counsel to claim investigators, who may work under his supervision or under that of the auditing department.

Enough district freight and passenger agents to cover the territory should be appointed by this general freight

and passenger agent. These district agents must cultivate their respective sections to the extent of acquaintanceship with their large shippers and all prospects. In soliciting, agents should carry on an investigation along the following lines:

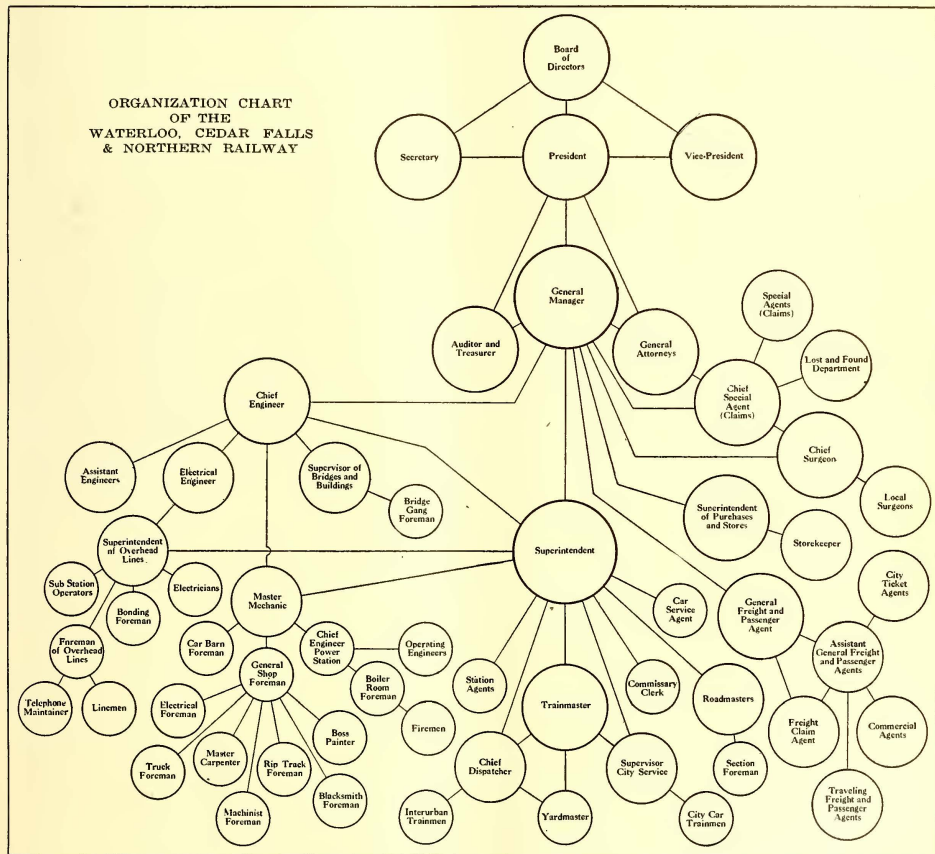
1. List all city and suburban points which require through freight service.
2. Determine the amount of outbound and inbound business to and from the heavy shipping points.
3. Prepare maps—one on a large scale to show each community; another on a smaller scale to show the sur-

rounded later by a clerk in the office of the general traffic agent. Learn and record the special requirements of each shipper.

5. In farm and orchard sections, learn in advance what the car requirements of each producer will be at the stated crop time. Such data of forehandedness should be indexed.

6. On completing these surveys, record and map the expected tonnages to predetermine the economical equipment required in beginning freight service.

The district agent should act in an advisory capacity



rounding country, and also one of company properties that may possibly be used for freight stations, including lots acquired.

4. Show on the maps the distance of the commercial center or the center of the city from all proposed freight stations, and note the corresponding distance of steam stations. Map also all prominent houses, bakeries, markets, packing houses, factories, quarries, sand pits, dairies, truck gardens, large farms, mines, grain elevators and other sources of traffic—these items may be catalogued on the maps by number or symbol and in-

to the local or way station agent, who usually knows his public's whims and fancies. All matters regarding the handling and the delivery of freight through the warehouse and way station should come through the local agent under the district agent's supervision. The fact that several station agents are under the jurisdiction of one district agent permits comparison of respective efficiencies and is a general stimulus to improvement in getting and handling freight traffic.

At larger freight stations the personnel, in addition to the local agent and regular clerical help, usually in-

cludes day and night foremen who supervise the checkers, receiving clerks and truckers. These foremen report directly to the local agent. The job of warehouse foreman is not easy, and it is highly necessary that a man appointed to this position should have the tact to handle subordinates and teamsters.

The treatment of the teamster is particularly important, for he is the shipper's representative and often embodies the only contact that the railway may have with the customer for months. Therefore, facilities should be provided to enable the teamsters to deliver goods and secure receipts without delay. Much can be accomplished in securing their good will by properly paved driveways and adequate weather awnings or canopies.

It is also highly important that great care should be given to the movement of freight through the warehouse. Inferior men paid less than the steam railroad scale cause a large number of "overs" and "shorts" and also damage merchandise. The cost of better-paid men will more than offset the cost of dissatisfied customers and freight claims that often exceed the actual gross freight revenue. Claims may be kept down also by using an experienced man or stevedore to stow shipments into the cars. Where business is not too great, the local agent should supervise the loading of freight, thereby assuming personal responsibility for its condition and loading.

Usually the local or way-station agent reports to all the proper departments regarding matters under his supervision. His ability should be equal to or better than that of the steam agent in the same community. Where it would not be profitable to keep a salaried agent, a store-keeper whose place is near the station often will act as agent, his compensation being based on the quantity of business handled.

Current practice on many electric lines is to combine the job of agent with that of substation attendant. This is satisfactory only when the business through the station is small and non-competitive. Such an agent's first duty is that of substation attendant, and he should not be expected to solicit business, collect bills and make adjustments outside the station unless he has an assistant. With the advent of the automatic substation, this difficulty may eventually be eliminated.

At points where there is not enough business to warrant a station, many roads have some local teamster act as the local agent, meet all trains and make collections and deliveries of freight. This teamster-agent acts as a way-station agent except that he has nothing to do with the sale of tickets to passengers. As this service does not require all of his time, he is able to do general teaming.

After the traffic begins to develop it is usually found that the simple traffic organization outlined above cannot handle all the work. It must be enlarged and specialized. Generally the dairy business is the first to demand this attention. A dairy agent can go a long way toward increasing this traffic, not only by looking after the details but also by inducing the farmers to organize co-operative milk depots and by arranging for lectures by experts from local educational institutions on increased efficiency in dairy output. After this division has been established, use may be found for an industrial agent to organize farmers into elevator companies, interest

manufacturers to locate their plants along the line, arrange for sidings to nearby plants, etc.

It may also be found necessary to employ an agent for soliciting freight. This agent may cover not only his own property but also that of competitive steam lines. He is especially valuable when able to secure the personal acquaintance of large shippers, even if he does not increase the local l.c.l. business. This can be better fostered by the local agent and his assistant, whose intimacy with the community leads them to be favored.

More business also leads to enlargement of the department for investigating and settling freight claims. The usual head of this department is a freight claim agent who reports directly to the general manager, since the results of his investigations often require that employees of other departments be disciplined. Enough claim investigators should be employed to permit expeditious handling of claims through personal investigation and correspondence. The shortest way to stop a claim is for the local and way-station agents to report all freight matters directly to the claim agent, with a copy to the traffic manager or other head of the traffic department.

A SPECIMEN GROWTH FROM SMALL BEGINNINGS

In developing any freight business, it seems logical to cultivate the local business first and then look for other territory to be served. A specific case of growth from small beginnings is the Waterloo, Cedar Falls & Northern Railway. This road was chartered originally in 1895, under the name of the Waterloo & Cedar Falls Rapid Transit Company. It adopted the present name in 1904, having in the meantime built up an extensive steam-road extension, of which one line of 33 miles was opened in 1903. In 1904 the company leased a 22-mile branch of the Chicago Great Western Railroad (steam) between Waverly and Sumner, Iowa.

In 1910, however, operation of the Chicago Great Western branch was discontinued, a line being built from Denver Junction to Waverly. In 1912 the company started a line from Waterloo to Cedar Rapids, completed it in September, 1914, and placed it in operation as a 1300-volt d.c. railway in March, 1915.

A few years ago this system had a very inadequate freight terminal in the city of Waterloo. It had traffic connection with but one steam line, which it reached only through the city streets. Freight cars could be handled only at night, and property owners protested. The management, realizing that good freight terminals were necessary to develop a large carload business, proceeded to build an outer belt line. This extends around the factory district of Waterloo and ties together all steam lines entering Waterloo. In connection with this belt line, trap-car service is operated to supplement the terminal freight operation in East Waterloo. The East Waterloo terminal is only five or six blocks from the principal business district of Waterloo.

At the terminal on the Denver Division, 17 miles north, connection is made with the Chicago Great Western Railroad to secure a shorter route to points north and west. A traffic agreement was entered into whereby freight directed to or coming from points north or west of Waterloo is turned over from the steam road to the electric line for handling. This agreement opened up a great territory for the jobbers and merchants of

Waterloo and enabled both the steam and electric lines to develop business in the new territory. It also helped the steam line to win competitive business which it had not been able to secure before on account of its inability to meet the time schedule of other steam lines.

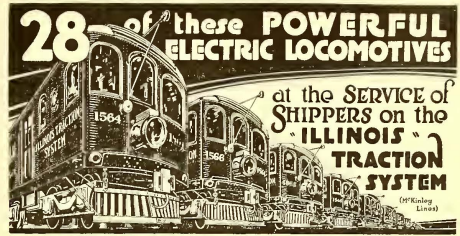
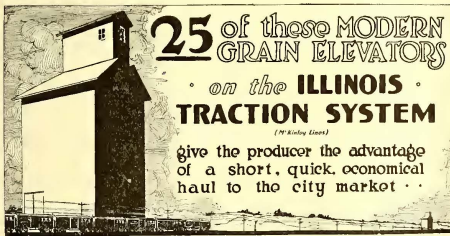
REAL FREIGHT SALESMANSHIP

One of the small country towns on the Waterloo, Cedar Falls & Northern line was visited by a traffic officer. Through conversation with a bank cashier he learned that the bank was in correspondence with four or five farmers in Illinois with reference to securing farms at some point in Iowa. Following up this slight clue, the officer went to Illinois to see the farmers, expecting, if successful, to secure the haulage of six or seven carloads of household goods and farm implements. The farmers, impressed by such intelligent inquiry, became interested to the extent that they bought farms located at different points along the electric line. All these farmers were progressive men. One of the first things they did on occupying their new farms was to begin tiling them for drainage. The older farmers in this vicinity were so impressed that several hundred

trials shipments to and from the various points and from farms along the line, including milk shipments for city dairies. The milk, which is picked up at country road crossings by the passenger cars, is handled by the duplicate ticket arrangement, each milk can bearing a ticket of the required denomination. Milk tickets are on regular sale at any of the company's stations. At various country crossings several co-operative creameries deliver to the road their butter shipments for Chicago and New York. This traffic, which is handled in refrigerator cars, averages one or more cars a week throughout the year.

To speak strictly, the express business is handled by the American Express Company, which looks after the development of this line. Therefore the responsibility for handling express does not fall upon the railway.

The traffic department of the Waterloo, Cedar Falls & Northern Railway is headed by a general freight and passenger agent, who is in complete charge of all traffic. Under him are two assistant general freight and passenger agents at two important terminals, and a traveling freight agent who makes his headquarters at the largest terminal city. The assistant general freight



BUILDING FREIGHT TRAFFIC WITH CAR CARDS ON THE I. T. S.

more cars of drain tile are shipped annually to this territory than in former years.

This line was further developed by keeping in touch with building contractors and men handling materials for new construction. By watching the award of contracts and following them up, it has been possible to secure the routing over the electric line of large quantities of brick, cement, plaster, hollow block, stone, sand, etc., purchased at points in the tributary territory.

In developing l.c.l. shipments, or package freight, a careful investigation was made of the shipments of milk and express parcels. When the Cedar Valley road placed in operation several years ago the line between Waterloo and Cedar Falls, and package freight was first handled, it was necessary to meet the competition of a dray line in order to get the business. The two towns were only 8 miles apart, but the slow dray service was well developed. A motor express car service of two round trips per day was installed. This service was well advertised. By degrees the dray competition was eliminated, so that now practically all the package freight between the two cities is handled by the interurban motor freight express cars at a great saving in time. This service is also handled in connection with the Chicago Great Western Railroad, shipments from Chicago into Cedar Falls aggregating a considerable amount daily.

In the factory district the electric line handles indus-

and passenger agent at the headquarters of the railway is in charge of assigned special duties, while the other assistant has charge of the solicitation of traffic. The traveling freight agent makes all competitive towns on the system, and a general agent in a small city on one of the branches has charge of all local traffic solicitation there. Then come the usual way-station agents.

To secure business to and from any point in the United States the general freight and passenger agent spends about one-half of his time in visiting the various trunk-line points throughout the country. His work is followed up by special agents across the United States. These call upon those large manufacturers who prohibit trunk line solicitations but who may be prevailed upon to route via electric lines. Agents and representatives of foreign lines with whom the electric line has business are also visited. These remarks apply before government control went into effect.

Records compiled from information secured by the traffic department are used to keep track of both the volume and the origin of business. These records are kept according to firms, towns, companies and information secured by personal contact with brokers.

In addition to the use of facilities like grain elevators and stockyards, several other excellent means new to freight business are pursued to increase traffic. Thus, competitive points are visited by the traveling freight

agent to induce elevator men to ship their grain over the electric line. Milling-in-transit arrangements permit grain coming from points on the electric line, its trunk-line connections or other points in Iowa and surrounding states, to be milled in transit and then shipped to destination as a completed product. For instance, a carload of corn routed to Chicago via the electric line is set out at Cedar Rapids, milled into starch and then forwarded to destination on the original billing. Thus the electric line can offer every advantage of the steam railroad in addition to its superior speed.

Reciprocal switching arrangements between the electric line and all trunk lines making connections in cities served by the former enable business industries located on other roads to be handled as if they originated on the electric line itself. By this arrangement all classes of business can be solicited regardless of location. For example, a complete train of automobiles routed from a connecting steam railroad was shipped from Flint, Mich., to Waterloo, Iowa, via the electric line.

Very often the projectors of an electric railway will find in examining territory that little more than a few stagnant villages and some discouraged farmers exist, but a closer study of the country itself will often disclose an enormous number of verdant forests, undeveloped quarries, sand-pits, ice-producing lakes and promising fruit and dairy-lands. It is not enough for the railway men to consider furnishing merely the means of transportation for these products. It is just as important that they assist considerably in encouraging the investment of capital in order to exploit these resources so that a profitable outlet may be found for each product and dormant communities may be aroused to the new possibilities that stand before them.

FREIGHT SERVICE MUST BE ADVERTISED

While it has always been the custom of railroads, both steam and electric to advertise their passenger business elaborately, in many instances electric lines have failed to foster their freight business, by means of advertising and constructive publicity.

It is not sufficient to advertise on the time table that a company has fast freight service. It is important that other mediums be used. First of all a small double-column newspaper "ad" about 2 in. deep, run every day, is one form of keeping the service before the public.

Another good form is the use of car cards. A notable example is the case of the Illinois Traction System, which advertises its facilities, not only motive power, but also grain elevators. Two of this company's cards are reproduced on page 47.

In connection with advertising motive power, it is always well to bear one thought in mind. This is, that it is highly necessary for confidence to be established in the minds of the shipping public. This is possible through telling them about the service and then, in turn, about the facilities that make this service possible, showing them that the company has the proper rolling stock to insure prompt and reliable transit.

Blotters are also an effective means of advertising freight service. The company publication, which is generally placed in the car rack, is an excellent medium to keep this service constantly in the minds of the public.

Another effective medium is bill-board advertising. A few bill-boards placed at strategic points along the

line may be of considerable service, as generally an attractively painted billboard is hard for a passerby—be he riding or walking—to get away from. A number of electric lines have resorted to this type of advertising for passenger service. Why not consider using such for freight service, which is much more profitable?

The Union Traction Company of Indiana, through a monthly publication known as the *Union Indiana Traction System Magazine*, distributes articles on truck farming and other subjects of interest to its communities. This magazine has proved to be of considerable force in fostering friendly feeling.

THIS IS THE SITUATION

In conclusion, the outstanding points of the electric railway freight situation are these:

1. Electric railway freight haulage is economically one of the most important factors in many of the rapidly growing communities of the country, especially in the Middle West. The field for hauling electric railway freight has not been thoroughly developed, because operators of electric railway properties have not gone into this phase of railroading in an analytical way.

2. A study of operating statistics will show that electric railways have handled freight as a side issue. Very few electric railway properties throughout the country show a freight business of more than 15 per cent of their gross revenue and many not 5 per cent. In the case of steam railroads the freight business has always been the backbone of gross receipts.

3. The "jitney" took millions of dollars from the electric railway before it was regulated, and the motor truck will take many more if electric railway managements do not wake up to the fact that they have an economic duty to perform for the communities served. This duty must be fulfilled by developing to the utmost the commercial and social side of the public by giving adequate freight service and last, but not least, first-class passenger service.

4. To develop freight business properly, it is necessary not only to analyze the field to be served, but also to employ proper facilities in the way of: A well-organized traffic bureau; station facilities according to the character of business to be handled; proper motive-power and rolling-stock equipment; a large number of trailer freight cars and last an unlimited and unrestricted imagination.

Denver Union Station Loop Improvements

Since the article on the layout of the Union Station loop in Denver, published in the issue of the *ELECTRIC RAILWAY JOURNAL* for Dec. 28, 1913, was prepared, information regarding several improvements at this point has been received. It has been agreed by the city and the Union Station interests, on the one hand, and the Denver Tramway on the other, that a covered runway will be built from the viaduct stairs to the point where the route to car is shown in the panoramic picture on page 1032 of that issue. A telephone booth, an inspector's station and a sand box will be placed at this point, and a large concrete platform will be put in. This will be another stopping point for cars going around the loop, as well as a transfer point to and from all north-side, east-side, and south-side lines that come together at the viaduct.

New Electric Rolling Stock for 1918

The Number of New Cars Ordered, Together with Those Built in Shops of Various Railways, Is Approximately the Same as in 1917, but the Number of Companies Ordering Cars Decreased Considerably—The Increasing Demand for One-Man Cars Is Shown by the Large Number of This type Ordered as Compared with Previous Years

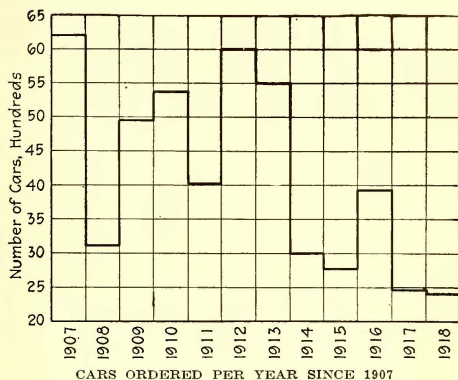
IN THE TABLES given herewith is this journal's annual compilation of the statistics for new rolling stock ordered by electric railways or built in their shops during the past year. While the total number of new cars placed in service is less than for any previous year recorded, the closeness of the 1918 total to the number for the year 1917 is especially encouraging, and comes somewhat as a surprise as it was the general opinion of most officials that very few cars had been ordered during 1918.

This compilation of figures received from the various electric railways in the United States and Canada represents the railways having about 97 per cent of all the electric cars operated. The total number of new cars so reported for this year is 2419 and is but thirty-six cars less than the number so reported for the year 1917. The number of companies which reported new equipment is 140 as compared with 182 for the year 1917.

Table I gives a comparison in condensed form of rolling stock purchased since 1907. The cars are classified according to the service in which they are used as city, interurban and miscellaneous. In this summary cars for operation on subway and elevated lines have been classed as in city service, and those for interurban or a combination of both interurban and city service have been placed in the interurban column. Electric locomotives, freight and express cars, snowplows and sweepers, and work cars for line and track, have been placed in the miscellaneous column. The numbers of interurban and miscellaneous cars purchased during 1918 has increased slightly over the figures given for the year 1917, and the number of city cars has decreased slightly.

Some of the special features that have been brought out by the canvass are given in Table II, and for com-

number of interurban trailers increased from twenty-seven for 1917 to fifty-five for the past year. Trailers which may be considered for city service numbered but 130. This included fifty for train operation on the Boston Elevated System. The difference from former years is affected by previous orders for subway trailers purchased by the Interborough Rapid Transit Company,



this latter company having purchased no cars during 1918. The number of locomotives ordered was forty-four, which is a decrease of five from the previous year.

The largest orders of passenger cars for an individual company reported were for 280 cars for use on the lines of the Philadelphia Rapid Transit Company, part of which were ordered by the United States Emergency Fleet Corporation for service to shipyards and part by the United States Housing Corporation, particularly for service to the League Island Navy Yard

TABLE I—NEW ROLLING STOCK ORDERED SINCE 1907

Year	City Cars	Interurban Cars	Freight and Miscellaneous Cars	Total
1907	3,483	1,327	1,406	6,216
1908	2,208	727	176	3,111
1909	2,537	1,245	1,175	4,957
1910	3,571	990	820	5,381
1911	2,884	626	605	4,015
1912	4,531	783	600	6,000
1913	3,820	547	1,147	5,514
1914	2,147	384	479	3,010
1915	2,072	336	374	2,782
1916	3,046	374	522	3,942
1917	1,998	185	272	2,455
1918	1,842	255	322	2,419

TABLE II—SPECIAL COMPARISONS OF NEW ROLLING STOCK

	1918	1917	1916
Total number of cars ordered.....	140	182	250
Number of locomotives purchased.....	2,419	2,455	3,942
Number of one-man cars ordered.....	644	280	187
Number of two-men and trail cars ordered for city service.....	*1,198	1,718	2,859
Number of locomotives purchased.....	44	49	31
Number of cars built in railway companies' shops.....	89	281	445
Number of interurban trailers purchased.....	55	27	71
Number of city trailers purchased.....	130	402	128

* Includes 100 motor cars for subway and elevated use.

parison the results for 1916 and 1917 have been included. The most notable of these is the increase in the number of one-man cars purchased. There were 644 purchased during the past year as compared with 187 and 280 for 1916 and 1917 respectively. Cars of all kinds built in railway shops total but eighty-nine, which is a large decrease over previous years. The

and the Frankford Arsenal, and an order for 200 motor cars and fifty trailers placed by the Boston Elevated Railroad. The United States Housing Corporation reported a total of 280 passenger cars which it had ordered for various railway properties. In the accompanying list the various railways reporting new equipment have been arranged alphabetically. Space limitations have

made it necessary to condense the data as much as possible. All cars are specified as either passenger or miscellaneous, and locomotives are entered separately. The classification of cars for city or interurban service has been made here in the same manner as previously explained. No attempt has been made to give details of construction other than over-all length. The majority of passenger cars are of either semi-steel or all-steel construction.

Although reports from all companies were not received in time for compilation and while studies of this

magnitude which must close on a definite date which necessarily precludes the possibility of a 100 per cent report from the industry, still the figures present very complete and accurate data. Through the courtesy and co-operation of the various car builders, equipment manufacturers and government organizations which have been interested in electric railways as a war measure, complete lists have been obtained so that it has been possible to check the companies' figures from several different sources. This courtesy and co-operation in supplying statistics is fully appreciated.

New Electric Rolling Stock Ordered in 1918

Railway	Number	Type	Overall Length	City or Interurban	Motor or Trailer	One or Two Man	Railway	Number	Type	Overall Length	City or Interurban	Motor or Trailer	One or Two Man
Allis-Chalmers Co.	1	Sn.Pl.	28' 0"		Mot.		Hydro-Elec. Power Commission	12	Locos.	36' 0"	50 tons		
Auburn & Syracuse Elec. R.R.	1	Loco.		30 ton				1	Sn.Pl.				
Augusta, Aiken Ry. & Elec. Corp.	2	Psg.	63' 0"	City	Int.	Two		2	Work Cars	32' 0"			
Bamberger Electric R.R.	3	Psg.	63' 0"	Int.	Mot.	Two		200	Dump Cars	20 cu yd.			
Bangor Ry. & Elec. Co.	23	Psg.	27' 9 1/2"	City	Int.	One	Illinois Traction System	6	Loco.	32' 0"	Int.	Mot.	
Boston Elevated Ry.	200	Psg.	48' 9 1/2"	City	Int.	Two		1	Misc.	72' 0"	Int.	Trail	
Brooklyn Rapid Transit Co.	50	Psg.	48' 2 1/2"	City	Int.	Two		1	Swpr.	28' 0"	City	Mot.	
Buffalo, Lockport & Rochester Ry.	6	Swpr.	39' 0"	City	Int.	Two		30	Psg.	50' 0"	Int.	Mot.	
Buffalo & Lake Erie Traction Co.	10	Psg.	30' 0"	Int.	Trail	Two		1	Loco.	60 ton	Int.	Trail	
Capital Traction Co.	20	Psg.	43' 1 1/2"	City	Int.	Two		1	Psg.	58' 0"	Int.	Trail	
Charleston Consolidated & Ltg. Co.	6	Psg.	41' 0"	City	Int.	Two		25	Psg.	27' 9 1/2"	City	Int.	Trail
Charleston Interurban R.R.	2	Psg.	47' 3 1/2"	Int.	Mot.	Two		15	Psg.	47' 0"	City	Int.	Trail
Chestor & Eddystone St. Ry.	22	Psg.	40' 6"	Int.	Trail	Two		2	Sn.Pl.	40' 0"	Int.	Trail	
Chicago, Lake Shore & South Bend Ry.	1	Psg.	43' 0"	Int.	Trail	Two		3	Psg.	32' 4"	City	Int.	Trail
Chicago, Milwaukee & St. Paul Ry.	5	Loco.	76' 0"	Int.	Trail			6	Psg.	45' 6"	Int.	Trail	
Chicago, North Shore & Milwaukee R.R.	1	Loco.	37' 4"	50 ton	Int.	Trail		10	Psg.	47' 3 1/2"	Int.	Trail	
Chicago & West Towns Ry.	2	Psg.	40' 0"	City	Int.	Two		1	Sn.Pl.	41' 4"	Int.	Trail	
Cincinnati & Columbus Traction Co.	1	Frt.	50' 0"	Int.	Trail			1	Swpr.	28' 0"	City	Int.	Trail
Cleveland, Alliance & Mahoning Valley R.R.	1	Psg.	55' 0"	Int.	Trail	Two		5	Psg.	39' 4"	City	Int.	Trail
Colorado Springs & Int. Ry.	24	Psg.	27' 9 1/2"	City	Int.	Two		7	Psg.	27' 9 1/2"	City	Int.	Trail
Columbia Ry. Gas & Elec. Co.	3	Psg.	50' 0"	City	Int.	Two		1	Swpr.	27' 9 1/2"	City	Int.	Trail
Columbus R.R. of Georgia	8	Psg.	27' 9 1/2"	City	Int.	One		3	Psg.	47' 5 1/2"	Int.	Trail	
East St. Louis Ry.	2	Psg.	27' 9 1/2"	City	Int.	One		6	Psg.	45' 0"	Int.	Trail	
Eastern Transat. Co.	9	Psg.	48' 0 1/2"	City	Int.	Two		3	Psg.	45' 0"	Int.	Trail	
Empire State R.R. Corp.	1	Sn.Pl.	27' 9 1/2"	Int.	Trail			10	Psg.	32' 0"	City	Int.	Trail
Fort Dodge, Des Moines & Southern R.R.	1	Psg.	29' 3 3/4"	City	Int.	One		1	Loco.	36' 0"	40 tons		
Fort Wayne & N. Indiana Traction Co.	25	Psg.	30' 7 1/2"	City	Int.	One		3	Psg.	48' 0"	Int.	Trail	
Galveston Elec. Co.	1	Sn.Pl.	22' 0"	City	Int.	One		2	Psg.	27' 9 1/2"	City	Int.	Trail
Gary Street Ry.	10	Psg.	48' 0"	Int.	Trail	Two		9	Psg.	57' 10"	Int.	Trail	
Glady & Valparaiso Ry.	2	Psg.	54' 7 1/2"	Int.	Trail	Two		4	Psg.	27' 9 1/2"	City	Int.	Trail
Glenade & Montrose Ry.	3	Psg.	27' 9 1/2"	City	Int.	Two		8	Psg.	47' 0"	Int.	Trail	
Grafton & Upton R.R. Co.	6	Loco.						240	Psg.	45' 6"	City	Int.	Trail
Grays Harbor Ry. & Lt. Co.	6	Psg.	27' 9 1/2"	City	Int.	One		15	Psg.	27' 9 1/2"	City	Int.	Trail
Hammard, Whiting & East Chicago Ry.	10	Psg.	27' 9 1/2"	City	Int.	One		25	Psg.	27' 9 1/2"	City	Int.	Trail
Harrisburg Ry.	5	Psg.	43' 10"	City	Int.	Two		15	Psg.	47' 8"	City	Int.	Trail
Hot Springs Street Ry.	7	Psg.	27' 9 1/2"	City	Int.	One		6	Psg.	27' 9 1/2"	City	Int.	Trail
Houston Elec. Co.	8	Psg.	27' 9 1/2"	City	Int.	One		2	Exp.	45' 0"	Int.	Trail	
Ivy Electric Co.	1	Swpr.	46' 0"					1	Loco.	45 ton	Int.	Trail	
								28	Psg.	46' 0"	City	Int.	Trail
								1	Psg.	27' 9 1/2"	City	Int.	Trail
								100	Subwy	67' 0"	City	Int.	Trail
								2	Psg.	52' 0"	Int.	Trail	
								1	Sn.Pl.	40' 0"	Int.	Trail	
								3	Psg.	27' 9 1/2"	City	Int.	Trail
								1	Loco.	37' 4"	60 ton	Int.	Trail
								10	Psg.	27' 9 1/2"	City	Int.	Trail
								10	Psg.	32' 0"	City	Int.	Trail
								1	Loco.	36' 0"	40 tons		
								3	Psg.	48' 0"	Int.	Trail	
								3	Psg.	27' 9 1/2"	City	Int.	Trail
								9	Psg.	57' 10"	Int.	Trail	
								4	Psg.	27' 9 1/2"	City	Int.	Trail
								5	Psg.	27' 9 1/2"	City	Int.	Trail
								8	Psg.	47' 0"	Int.	Trail	
								240	Psg.	45' 6"	City	Int.	Trail
								15	Psg.	47' 8"	City	Int.	Trail
								25	Psg.	27' 9 1/2"	City	Int.	Trail
								15	Psg.	47' 8"	City	Int.	Trail
								1	Frt.	50' 0"	City	Int.	Trail
								6	Psg.	27' 9 1/2"	City	Int.	Trail
								2	Psg.	27' 9 1/2"	City	Int.	Trail
								6	Psg.	27' 9 1/2"	City	Int.	Trail
								4	Psg.	27' 9 1/2"	City	Int.	Trail
								25	Psg.	27' 9 1/2"	City	Int.	Trail
								25	Psg.	50' 0"	City	Int.	Trail
								33	Psg.	48' 4 1/2"	City	Int.	Trail
								15	Psg.	27' 9 1/2"	City	Int.	Trail
								2	Psg.	30' 0"	City	Int.	Trail
								1	Misc.	32' 0"	City	Int.	Trail
								1	Work	45' 0"	City	Int.	Trail
								1	Swpr.	28' 0"	City	Int.	Trail
								24	Psg.	36' 6"	City	Int.	Trail
								1	Loco.		50 ton		
								10	Psg.		City	Trail	

Railway	Number	Type	Overall Length	City or Interurban	Motor or Trailer	One or Two Man
Saginaw Bay City Ry.....	7 Pgr.	42' 0"	City	Two	One	One
	14 Pgr.	27' 9 1/2"	City	Two	One	One
	1 Swpr.	40' 0"	City	Two	One	One
	1 Sn.Pl.	45' 6"	City & Int.	Two	One	One
Sand Springs Ry.....	1 Line car	30' 0"	City	Two	Two	Two
Scioto Valley Trac. Co.....	2 Pgr.	60' 0"	Int.	Two	Two	Two
	4 Pgr.	60' 0"	Int.	Two	Two	Two
	1 Frt.	50' 0"	Int.	Two	Two	Two
	6 Frt.	42' 0"	Int.	Trail	Two	Two
Seattle Municipal Ry.....	12 Pgr.	27' 9 1/2"	City	One	One	One
	25 Pgr.	43' 2 1/2"	City	Two	Two	Two
Sheffield Co.....	9 Pgr.	44' 0"	City	Trail	Two	Two
Shore Line Elec. Ry.....	2 Pgr.	45' 8 1/2"	Int.	Two	Two	Two
Southern New York Pr. & Ry. Corp.....	4 Box for mail service					
Southern Public Utilities Co.....	4 Pgr.	38' 2"	City	Two	Two	Two
Southwest Missouri R.R.....	7 Pgr.	44' 0"	Int.	Two	Two	Two
Springfield Trac. Co.....	12 Pgr.	27' 9 1/2"	City	One	One	One
Stark Elec. R.R.....	2 Pgr.	55' 0"	Int.	Two	Two	Two
St. Cloud Public Service Co.....	4 Pgr.	34' 0"	City	One	One	One
Steuenville, East Liverpool & Beaver Valley Tr. Co.....	1 Swpr.	28' 0"	City	One	One	One
St. Joseph Ry., Lt., Ht. & Fr. Co.....	12 Pgr.	27' 9 1/2"	City	One	One	One
Stockton Electric R.R.....	5 Pgr.	27' 9 1/2"	City	One	One	One
Tacoma Municipal Ry.....	20 Pgr.	43' 0"	City	Two	Two	Two
Tacoma Ry. & Fr. Co.....	29 Pgr.	27' 9 1/2"	City	One	One	One
Tampa Elec. Co.....	24 Pgr.	27' 9 1/2"	City	One	One	One
Terre Haute, Indianapolis & Eastern Trac. Co.....	5 Frt.	40' 0"	Int.	Trail	Two	Two
Terre Haute Trac. & Lt. Co.....	30 Pgr.	27' 9 1/2"	City	Two	Two	Two
Texas Elec. Ry.....	6 Pgr.	27' 9 1/2"	City	Two	Two	Two
Tomrup, Geo. H. (St. Louis).....	50 Pgr.	27' 9 1/2"	City	Two	Two	Two
Trenton & Mercer County Trac. Corp.....	20 Pgr.	27' 9 1/2"	City	Two	Two	Two
Tusealoosa Ry. & Utilities Co.....	1 Pgr.	43' 5 1/2"	City	Trail	Two	Two
Union Ry.....	1 Sn.Pl.					
Union Street Ry.....	6 Pgr.	44' 0"	City	Two	Two	Two
United Rys. & Elec. Co.....	50 Pgr.	44' 0"	City	Two	Two	Two
Utah-Idaho Central R.R.....	5 Pgr.	27' 9 1/2"	City	One	One	One
Vicksburg Lt. & Trac. Co.....	4 Pgr.	27' 9 1/2"	City	One	One	One
Virginia Ry. & Tr. Co.....	50 Pgr.	27' 9 1/2"	City	One	One	One
Washington, Baltimore & Annapolis E. R.R.....	5 Pgr.	57' 0"	Int.	Two	Two	Two
Washington Ry. & Elec. Co.....	50 Pgr.	43' 1 1/4"	Int.	Two	Two	Two
Washington-Virginia Ry.....	22 Pgr.	48' 0"	Int.	Two	Two	Two
Webster, Manassas, Belle Vernon & Fayette City St. Ry.....	20 Pgr.	48' 0"	Int.	Trail	Two	Two
Western New York & Penn. Trac. Co.....	5 Pgr.	45' 0"	Int.	Two	Two	Two
Waterville, Fairfield & Oakland Ry.....	2 Pgr.	43' 6"	City	Two	Two	Two
Webster, Manassas, Belle Vernon & Fayette City St. Ry.....	3 Pgr.	32' 0"	City	Two	Two	Two
Western New York & Penn. Trac. Co.....	2 Pgr.	47' 0"	Int.	Two	Two	Two
West Penn. Rys. & Elec. Co.....	4 Pgr.	57' 10"	Int.	Two	Two	Two
Western Washington Pr. Co.....	4 Swpr.	28' 0"	Int.	Two	Two	Two
White Trac. Co.....	10 Pgr.	48' 0"	Int.	Two	Two	Two
Winnipeg Elec. Ry.....	29 Pgr.	50' 0"	City	Two	Two	Two
	1 Swpr.	37' 8 1/2"	City	Two	Two	Two

* Included to have table represent all known orders.

An Engineering Magazine to Be Published in Spanish

REALIZING the value of the international exchange of ideas on things engineering, the McGraw-Hill Company on March 1 will begin publication of a magazine dedicated to that purpose. While eventually it is expected to appear in editions in several languages, the original issue will be in Spanish, under the name *La Ingenieria Internacional*, aimed to serve Latin-America and Spain.

The purpose of the new magazine, which has been under consideration for some years, is to afford a medium for presentation of those developments in American engineering which may be of value to engineers, contractors and manufacturers in other lands. At the same time, following the practice of the present McGraw-Hill publications, a far-flung editorial organization will be developed, so that there will be drawn into the paper the best of engineering practice in Latin America, Spain and other Spanish-speaking countries. Aside from this function, the new magazine will be an important developer of international good-will, and at the same time a medium by which American manufacturers engaging in export trades can carry their message to prospective buyers in foreign lands.

It may be a cause for surprise that the McGraw-Hill Company, whose specialized papers circulate so widely overseas, should establish a magazine to serve the foreign field. The reason, however, is not hard to find. The present highly-specialized papers appeal primarily to those who are situated where engineering enterprise has made such progress that there is room for the specialist and need for the last refinement in equipment and design.

But everywhere the world over are territories newly developing, where the engineer, the contractor and the manufacturer must undertake not one but many lines. It is to serve the general practitioner so situated that the new magazine, and its later companions in other languages, will be started. The spe-

cialized papers in English will still hold their place as the recorders of the best in the advanced practice of engineering in America and abroad.

1917 Census of Street and Electric Railways Due Soon

S. L. ROGERS, Director of the Census, in his annual report to the Secretary of Commerce, made public in Washington the past week, announces that his bureau will soon be able to present to the public the result of the census of electrical industries which was taken during 1917. The census, which was begun in April, will present information as to the number of establishments engaged in electrical industry, character of ownership, traffic, equipment, expenses, employees, salaries and wages, finances, etc. The compilation of this information is now under way. An abstract of the 1912 census report was printed in the issues of the *ELECTRIC RAILWAY JOURNAL* for Jan. 9 and 16, 1915, pages 96 and 130.

In his annual report Director Rogers says:

This census, which, under the act creating the permanent Census Bureau, has been taken quinquennially since 1902, covers central electric light and power stations, street and electric railways, telephones and telegraphs, and municipal electric fire alarm and police patrol signaling systems. The current inquiry is being made as of Dec. 31, 1917.

By reference to the various records available, supplemented by correspondence with some 14,000 postmasters throughout the country, with state telephone associations, and with public service commissions, a card index of establishments engaged in electrical industries was prepared. In formulating the schedules used, criticisms and suggestions were requested and obtained from the Interstate Commerce Commission, the American Telephone & Telegraph Company, the independent telephone companies, the American Electric Railway Association, the American Railway Accountants' Association, and the National Electric Light Association, and a number of conferences were held with representatives of these organizations. All the organizations named have given their hearty co-operation and have rendered valuable assistance to the bureau in the revision of the schedules and the preparation of the reports.

New Track Constructed and Track Rebuilt During 1918

Reports Received from the Various Electric Railways in the United States and Canada Show a New Electric Mileage of 346 Constructed During the Past Year and 275 Miles of Steam Lines Electrified—The Amount of Track Reconstruction Was Very Small

THE single track mileage for new lines built or electrified during the year 1918 together with the mileage of track rebuilt by electric railways in the United States and Canada is given in the accompanying tabulation. The data for this record have been received from electric railways comprising about 97 per cent of the total mileage under electric operation and are quite complete in view of the difficulties involved in conducting a canvass of such large proportions.

In order to facilitate comparison with similar data for previous years the following table has been prepared from the statistical tables published by the ELECTRIC RAILWAY JOURNAL for the years since 1907. In this the amount of electrified steam mileage has been separated from the new electric mileage.

The total new electric railway track mileage exclusive of the electrified steam lines for the year amounting to 314 is but 63 miles less than that reported during 1917. When the difficulties that most roads have experienced in obtaining new rails and special work is considered this record is very gratifying. However most of this is made of spurs and short extensions and few additions of any considerable extent were carried out due to the extreme conditions. Of the 314 miles of new electric railway track built, 80.85 miles was for the various additions to new rapid transit lines in New York City. In addition to this there was 135.56 miles of new track built for city service and 97.4 miles constructed for interurban operation. Although a comparison of the new electrified mileage placed in operation in the last two years shows a decrease from the figures of 1916 still the year 1918 more nearly approached these figures. Both the 1916 and the 1918 electrified mileages were augmented by the extensions of the Chicago, Milwaukee & St. Paul electrification which amounted to 225 miles in 1916 and

211 miles in 1918. Outside of this the greatest amount of electrified mileage reported for this year was 51.15 miles of main and branch line track together with sidings and yards electrified by the Norfolk & Western Railway.

In the general compilation of the statistics received the usual plan of grouping the roads by states has been followed. New York heads the list of states with a

COMPARISON OF NEW TRACK BUILT—BY YEARS

Year	New Electric Railway Track Built	Electrified Steam Line	Total New Electric Mileage
1907			1,880.0
1908	1,174.5	84.0	1,258.5
1909	774.7	112.4	887.1
1910	1,204.8	192.4	1,397.2
1911	1,105.0	86.5	1,191.5
1912	869.4	80.8	950.2
1913	974.9	119.0	1,093.9
1914	716.5	229.0	946.4
1915	596.0	448.2	1,044.2
1916	356.3	388.0	744.3
1917	376.7	66.0	442.7
1918	313.82	275.7	589.53

total of 87.93 miles of new track and 25.59 miles of track rebuilt. This, of course, excludes the states of Montana and West Virginia, in which large amounts of steamroad electrification were included. Following this comes California with 28.94 miles and Washington with 24.65 miles of new track constructed, the greater part of which was for city service.

In Canada the Niagara Construction Railway built 28 miles of interurban track between Stamford, St. David's and Queenstown, Ontario. This was the greatest amount reported.

The total rebuilt mileage for the year was 155.43 as compared with 375.4 miles for the year 1917 or less than half as much. Most of this was in short stretches, there being but seven companies which rebuilt more than 5 miles and the largest amount reported was but 9 miles.

	New Track Miles	Rebuilt Mileage
ALABAMA		
Mobile & Pensacola Ry. & Navigation Co.....	0.00	2.00
Peoples Railroad	1.50	0.00
	1.50	2.00
ARKANSAS		
Intercity Terminal Ry.....	0.00	1.10
	0.00	1.10
CALIFORNIA		
Municipal Railway of San Francisco.....	9.72	0.00
Pacific Electric Railway.....	15.04	0.00
Pacific Gas & Electric Co.....	0.04	0.00
Petaluma & Santa Rosa Ry.....	0.16	0.00
San Diego Electric Ry.....	1.21	2.00
United Railroads of San Francisco.....	2.87	2.50
	28.94	4.50
COLORADO		
Arkansas Valley Ry., Lt. & Pr. Co.....	0.00	2.25
Denver Tramway.....	0.24	0.63
	0.24	2.88

	New Track Miles	Rebuilt Mileage
CONNECTICUT		
Connecticut Co.....	1.57	1.15
The Shore Line Electric Ry.....	0.00	1.10
	1.57	2.25
DISTRICT OF COLUMBIA		
Capital Traction Co.....	1.02	0.59
Washington & Maryland Ry.....	0.93	0.00
	1.95	0.59
FLORIDA		
Jacksonville Traction Co.....	6.41	0.00
	6.41	0.00
GEORGIA		
Columbus R. R.....	0.50	0.00
Savannah Electric Co.....	4.88	0.00
	5.48	0.00
IDAHO		
Caldwell Traction Co.....	12.00	0.00
	12.00	0.00

	New Track, Miles	Rebuilt Mileage		New Track, Miles	Rebuilt Mileage
ILLINOIS			NORTH CAROLINA		
Chicago Surface Lines.....	7.00	8.50	Durham Traction Co.....	0.00	0.75
Chicago & Interurban Traction Co.....	0.00	0.50	Tidewater Pwr. Co.....	4.00	0.00
Chicago & Oak Park Elevated R. R.....	0.00	2.57		4.00	0.75
Chicago, North Shore & Milwaukee R. R.....	2.30	0.00			
Evanston Ry.....	0.00	1.00	NORTH DAKOTA		
Hammond, Whiting & Eastern Traction Co.....	0.00	0.23	Northern States Power Co.....	0.00	0.33
Metropolitan West Side Elevated Ry.....	0.00	0.34		0.00	0.33
Northwestern Elevated R. R.....	0.00	1.52			
	10.15	14.26	OHIO		
INDIANA			City Ry., Dayton.....	0.00	0.87
Chicago, South Bend & Northern Indiana Ry.....	5.00	0.00	Columbus, Delaware & Marion Electric Co.....	0.00	1.00
Fort Wayne & Northern Indiana Traction Co.....	0.79	1.20	Maboung & Shenango Ry. & Lt. Co.....	4.90	0.00
Terre Haute, Indianapolis & Eastern Traction Co.....	0.00	0.50	Northern Ohio Traction & Lt. Co.....	2.96	0.04
Union Traction Co. of Indiana.....	0.00	0.77	The Oakwood Street Ry.....	0.57	0.00
Vincennes Traction Co.....	0.60	0.40	Ohio River Electric Ry. & Pwr. Co.....	0.00	1.00
	6.39	2.97	Richard Public Service Co.....	0.00	0.17
IOWA			Springfield Terminal Ry. & Pwr. Co.....	0.10	0.00
Moline, Rock Island & Eastern Traction Co.....	0.70	0.00		8.53	3.58
Ottumwa Ry. & Light Co.....	0.00	0.27	OKLAHOMA		
Tri-City Ry.....	1.72	0.82	Enid City Ry.....	0.00	0.30
	2.42	1.09	Oklahoma Union Ry.....	10.00	0.00
KANSAS			Sand Springs Ry.....	3.00	3.00
Kansas City, Lawrence & Topeka R. R.....	0.00	0.06		13.00	3.30
Manhattan City & Interurban Ry.....	0.10	0.00			
	0.10	0.06	OREGON		
LOUISIANA			Pacific Pwr. & Lt. Co.....	0.05	0.00
New Orleans Ry. & Lt. Co.....	1.67	1.07	Portland Ry., Lt. & Pwr. Co.....	0.16	0.54
	1.67	1.07		0.21	0.54
MAINE			PENNSYLVANIA		
Bangor Ry. & Electric Co.....	0.00	0.27	Conestoga Traction Co.....	0.23	0.00
Lewiston, Augusta & Waterville Street Ry.....	1.84	0.44	Harrisburg Rys.....	0.00	0.45
Portland R. R.....	0.29	0.62	Lewisburg, Milton & Watsontown Pgr. Ry.....	0.31	0.00
Waterville, Fairfield & Oakland Ry.....	0.00	0.25	Penn Central Ry.....	3.50	0.00
	2.13	1.58	Philadelphia Rys.....	4.75	8.00
MARYLAND			Pottstown & Phoenixville Ry.....	0.00	3.00
United Rys. & Electric Co.....	4.75	9.15	Reading Transit & Lt. Co.....	0.00	2.25
	4.75	9.15	Woodlawn & Southern Street Ry.....	0.18	0.00
MASSACHUSETTS				8.97	13.70
Blue Hill Street Ry.....	0.00	1.50	RHODE ISLAND		
Boston Elevated Ry.....	3.64	9.00	The Rhode Island Co.....	0.00	3.10
Holyoke Street Ry.....	0.00	1.00		0.00	3.10
Middlesex & Boston Street Ry.....	0.00	0.35	SOUTH DAKOTA		
Springfield Street Ry.....	0.00	1.00	Sioux Falls Traction System.....	0.00	9.70
Union Street Ry.....	0.11	1.56		0.00	9.70
Worcester Consolidated Street Ry.....	0.88	1.50			
	4.73	15.91	TEXAS		
MICHIGAN			Dallas Ry.....	3.43	2.71
Detroit, Jackson & Chicago Ry.....	0.00	0.12	Eastern Texas Electric Co.....	0.00	0.10
Detroit United Ry.....	11.18	1.88	El Paso Electric Ry.....	0.00	2.25
Escanaba Traction Co.....	0.00	0.80		3.43	3.56
	11.18	2.80	VIRGINIA		
MISSOURI			Newport News & Hampton Ry., Gas & Elec. Co.....	4.04	0.20
Kansas City Rys.....	1.61	4.42		4.04	0.20
Missouri Electric R. R.....	0.21	0.00	WASHINGTON		
Southwest Missouri R. R.....	15.00	0.00	Seattle Municipal Street Ry.....	23.00	0.00
St. Louis & Jennings Ry.....	0.00	1.25	Tacoma Municipal Ry.....	1.85	0.00
United Rys. Co. of St. Louis.....	4.01	19.41		24.65	0.00
Vicksburg Lt. & Traction Co.....	0.00	5.00	WEST VIRGINIA		
	20.83	21.08	Charleston Interurban R. R.....	1.90	6.30
MONTANA			Lewisburg & Ronceverte Electric Ry.....	0.70	0.00
Anaconda Copper Mining Co.....	1.0	0.00	Monongahela Valley Traction Co.....	4.00	0.18
Chicago, Milwaukee & St. Paul Ry.....	211.0	0.00	Norfolk & Western Ry.....	51.15	0.00
	212.0	0.00		57.75	6.48
NEBRASKA			WISCONSIN		
Omaha & Council Bluffs Street Ry.....	0.00	1.00	Madison Rys.....	0.21	0.00
	0.00	1.00	Wisconsin Ry., Lt. & Pwr. Co.....	0.00	1.00
NEW JERSEY				0.21	1.00
Millville Traction Co.....	0.00	0.50	MANITOBA		
Public Service Ry.....	3.04	0.00	Suburban Rapid Transit Co.....	0.25	0.00
	3.04	0.50	Winnipeg Electric Ry.....	1.76	0.00
NEW MEXICO				2.01	0.00
Las Vegas Transit Co.....	0.00	1.06	ONTARIO		
	0.00	1.06	Grand River Ry.....	2.00	0.00
NEW YORK			Quebec Rapid Ry. System (Surface).....	0.00	0.50
Auburn & Syracuse Electric R. R.....	0.23	0.00	Niagara Construction Ry.....	28.00	0.00
Buffalo & Depew Ry.....	0.50	3.00	Port Arthur Civic Ry.....	0.00	0.92
Buffalo & Lake Erie Traction Co.....	3.80	0.76	Sandwich, Windsor & Amherstburg Ry.....	3.00	0.00
Bush Terminal R. R.....	0.05	0.41	Toronto Civic Ry.....	1.99	0.00
Hornell Traction Co.....	0.00	0.10		34.99	1.42
Interborough Rapid Transit Co.....	55.50	0.00	QUEBEC		
International Ry.....	0.00	1.36	Hull Electric Ry.....	1.33	1.33
New York Central R. R.....	0.90	6.30	Levis County Ry. Traction Co.....	0.00	4.00
New York Municipal Ry. Corp.....	25.25	0.00	Shawinigan Falls Terminal Ry.....	1.00	0.00
New York Rys.....	0.00	1.04		2.33	5.33
New York State Rys. (Syracuse-Utica Line).....	1.92	1.92			
Niagara Junction Ry.....	0.58	0.00			
Northern New York Pwr. & Ry. Corp.....	0.00	3.00			
Third Ave. Ry.....	0.00	7.50			
	87.93	25.59	Total for all companies.....		
				589.53	156.43

Data on Automatic Substations

THE automatic control of substation equipment, and to a less extent that of power plant equipment, is a development of but a few years. So far but one manufacturer has gone into this field extensively, but one other has already entered it and others may be expected to do so in time. War conditions have hampered progress but the installations and the apparatus ordered, as listed in the accompanying table, make a creditable showing. Interest in the "automatic" is so great now that the year 1919 should bring a substantial increase in its application.

It has seemed wise to include the automatic control equipment for electric generators in this first table. Another year may make a separate list of this desirable. Included in the table also is an automatic synchronous condenser control used for correcting power factor on the lines of the Interstate Light & Power Company. This is another field automatic control which illustrates the flexibility and adaptability of the fundamental scheme.

The forerunner of the automatic substation, the remote-control substation installed by the Detroit Edison Company in 1913, is not included in the table as being outside of its scope. This substation should

not be overlooked, however, as the Detroit Edison is now operating five of these 500-kw. remote-controlled lighting converter substations on its 4600-volt, 60-cycle supply lines. The last one was put into commission in 1918. The pioneer true "automatic" was that started in July, 1915, on the line of the Elgin & Belvidere Electric Company, as shown in the second line of the table.

Details of the novel features of practically all of this equipment listed in the table have been given in recent issues of the ELECTRIC RAILWAY JOURNAL. In an early issue Charles H. Jones will take up the substation of the Chicago, North Shore & Milwaukee Railroad, and other articles will supplement those already printed.

Coal-Saving Bonus in London

The London County Council is distributing a coal-saving bonus among motormen and conductors on its tramways. During the past quarter the saving was more than \$16,000, one-half of which has been distributed. This is slightly under 5 per cent of the value of the total consumption, and it is expected that even better results will be secured as the possibility of saving becomes more clearly understood by the men.

AUTOMATIC SUBSTATIONS INSTALLED BY, OR ON ORDER FROM, THE GENERAL ELECTRIC COMPANY

Company	No. of Stations	No. of Contr. Eqp't.	Kilowatt Rating	Type of Machine	Trolley Voltage	Power Supply Voltage	Frequency, Cycles per Second	Remarks	Placed in Operation
New South Wales Government Railways.....	1	1	450	Synchronous converter	600	6,600	25	Remote control	February, 1916
Elgin & Belvidere Electric Co.	3	3	300	Synchronous converter	600	26,400	25		February, 1916 October, 1915 June, 1916
Potomac Electric Company	1	1	500	Synchronous converter	600	12,500	25		
Milwaukee Electric Railway & Light Company... 1	1	2-300	300	Synchronous converter	1200	13,200	25	Two machines operating in series	May, 1917 February, 1917
Interstate Light & Power Co., Hazel Green, Ill. 1	1	1	3000	Synchronous converter	600	2,300	60		
Des Moines City Railway	1	1	500	Synchronous converter	600	2,250/4,500	25		October, 1916
Des Moines City Railway	1	1	500	Synchronous converter	600	4,500/22,500	25	Portable substation	September, 1916
Inter Urban Railway, Des Moines, Iowa.	2	2	300	Synchronous converter	600	22,500	25		December, 1916 February, 1917
Inter Urban Railway, Des Moines, Iowa.	1	1	500	Synchronous converter	600	22,500	25		November, 1917
Grand Rapids, Grand Haven & Muskegon Railway 1	1	1	300	Synchronous converter	600	17,500	30		April, 1917
Adirondack Electric Power Corporation.....	1	1	300	Synchronous converter	600	17,300	40		
Rhode Island Company	1	2	300	Synchronous converter	600	13,200/11,200	25	Operate in Parallel	May, 1918
Rhode Island Company	1	1	500	Synchronous converter	600	11,000/22,000	60		February, 1918
Chicago & Interurban Traction Company	1	1	500	Synchronous converter	600	33,000	25		August, 1917
Columbus Railway, Power & Light Company... 1	1	500	Synchronous converter	600	13,200/22,800	60	Remote control	March, 1918	
Boston & Maine Railroad	1	1	500	Water wheel generator	500	22,000/13,200	60	Direct feed	July, 1917
Des Moines City Railway	2	2	500	Synchronous converter	600	2,200/4,400	25		November, 1917
Butte Electric Railway	1	1	500	Synchronous converter	600	3,800	60		January, 1918
Aurora, Elgin & Chicago Railroad	1	1	500	Synchronous converter	600	26,400	25		January, 1918
Chicago & Interurban Traction Company	1	1	300	Synchronous converter	600	33,000	25	Portable	August, 1918
Iowa Railway & Light Company	1	1	500	Synchronous converter	600	16,500/33,000	60		April, 1918
Kansas City Railway	1	1	500	Synchronous converter	600	6,000/13,200	25		June, 1918
Chicago, North Shore & Milwaukee Railroad... 1	1	500	Synchronous converter	600	33,000	25		April, 1918	
Des Moines City Railway	2	2	500	Synchronous converter	600	2,250/4,500	25		April, 1918 May, 1918
Chicago, North Shore & Milwaukee Railroad... 1	1	500	Synchronous converter	600	33,000	25		December, 1917	
New York State Railways	1	1	300	Synchronous converter	600	60,000	40		
Northern Ohio Traction & Light Company	2	2	300	Synchronous converter	600	22,000	60		
Kansas City Railway	1	1	1000	Synchronous converter	600	6,600	25		
Transit Supply Company	1	1	1500	Synchronous converter	600	12,500	35		
New York State Railways	1	1	250	Synchronous converter	600	11,000	25		
Chicago, North Shore & Milwaukee Railroad... 1	1	1	500	Synchronous converter	600	33,000	25		November, 1918
Chicago, North Shore & Milwaukee Railroad... 1	1	1	1000	Synchronous converter	600	13,200/33,000	25		
Omaha & Council Bluffs Street Railway	1	1	1000	Synchronous converter	600	13,200	25		
Chicago & Joliet Electric Railway	1	1	300	Synchronous converter	600	13,200	60		
Salt Lake, Garfield & Western Railway	2	2	600	Motor generator set...	1500	44,000	60	One—remote control	
Oklahoma Union Railway	1	1	300	Synchronous converter	600	6,600	60		
Consolidated Traction Company	1	1	300	Synchronous converter	600	11,000	25		
New South Wales Government Railways	1	1	200	Synchronous converter	600	6,600	25	Remote control	
Duluth Street Railway	1	1	500	Synchronous converter	600	13,200	25		
Des Moines City Railway	1	1	500	Synchronous converter	600	2,250/4,500	25		
Cincinnati, Lawrenceburg & Aurora Electric Street Railway	2	2	200	Synchronous converter	600	33,000	60		
Duluth Street Railway	1	1	1000	Synchronous converter	600	14,200	25		
Pacific Electric Railway	1	1	1000	Synchronous converter	600	15,000	50		
Pacific Electric Railway	1	1	1000	Motor generator set...	600	15,000	50		
Wisconsin Light, Heat & Power Company	1	1	300	Motor generator set...	600	66,000	60		
Inter Urban Railway, Des Moines, Iowa.	1	1	500	Synchronous converter	600	22,500	25		
Inter Urban Railway, Des Moines, Iowa.	1	1	300	Synchronous converter	600	22,500	25		
Chicago, North Shore & Milwaukee Railroad... 1	1	500	Synchronous converter	600	13,200/23,000	25			
Sacramento Northern Railway	1	1	300	Synchronous converter	600	2,300	60		

The Worst Year the Industry Has Experienced

Mileage Placed in Receivership in 1918 Is Three and a Half Times the Average for the Last Ten Years—Nearly 500 Miles and \$16,525,000 of Capitalization Involved in Dismantlement or Suspension of Service

A HARD YEAR for electric railways—such must be the conclusion reached after a review of the receiverships, foreclosure sales and abandonments in the industry during 1918. The high cost of operation, owing to the increased prices of labor and materials, and the difficulty of securing compensatory revenues left many a company in a crippled condition. Of course the financial difficulties of some companies were the result of accumulated burdens of regulation, of unrestricted competition, of over-capitalization or of organization weaknesses, but the chances of such companies being able to effect satisfactory reorganizations so as to insure the continuance of service were greatly reduced during the last year on account of the decreased net earning power of the industry.

The year 1918 has resulted in more than the usual number of companies being operated or sold under court orders for the protection of investors or creditors. This fact, however, does not indicate the most significant phase of the situation. The big point in the year's record is that so many properties have grown weary from hope long deferred and have preferred dismantlement at present-day scrap prices rather than prolonged existence as losing ventures. Almost three score companies have suspended service in whole or in part, and in most cases they have dismantled or have secured permission to dismantle their lines. Sometimes the owners have voluntarily scrapped the properties; and sometimes, in the case of forced sales, the junk dealer has been the only bidder.

The total wrecks of the year, it will be noticed, were in the main small properties, and without a doubt some had probably been founded upon hopes rather than upon a sound knowledge of utility operation and community needs and thus had at best a restricted future. Yet all the abandoned companies had managed to live through other lean years, and their final collapse in 1918 is only cumulative evidence of the grievous burdens that today are bearing down upon every company, be it small or large.

These burdens, of course, have made themselves felt in different ways and in varying degrees for individual cases. The accompanying compilations are designed to cover all companies from those for which court aid was sought in 1918 to those whose car wheels then turned for the last time. These do not show to the full, however, the damage of 1918 to the industry, for many other companies are near the danger line as far as earning power, credit and adequate service are concerned. Many dividends have been cut or omitted; many interest payments have been allowed by bondholders to run at default in the hope of friendly readjustments, and many companies have announced that curtailment or suspension of service will be inevitable unless relief is granted. No effort has been made to tabulate such instances, but the fact that they exist is mentioned to make more

emphatic the statement that the financial condition of all electric railways not included in the compilations can by no stretch of the imagination properly be considered as sound.

To take up the compilations in turn, consider first the receiverships. The accompanying record for the last ten years shows clearly the extent to which the number, the mileage and the capitalization of companies placed in receivers' hands in 1918 far exceeded those of 1915, the record year theretofore. The 1918 mileage was about three and a half times the average for the preceding nine years. The receivership of the Brooklyn Rapid Transit Company on the last day of 1918 naturally runs the totals for this year to a high figure, but even without this company the 1918 figures are in the main larger than in any preceding year. The mileage placed under receivership during 1918 represents more than 4 per cent of the total mileage of the country.

RECORD OF ELECTRIC RAILWAY RECEIVERSHIPS

	Number of Companies	Miles of Track	Outstanding Stock	Outstanding Funded Debt
1909	22	558.00	\$29,962,200	\$22,325,000
1910	11	696.61	12,629,400	75,490,735
1911	19	518.90	29,533,450	38,973,293
1912	26	373.58	20,410,700	11,133,800
1913	18	542.84	31,006,900	47,272,200
1914	10	362.39	35,562,590	19,050,460
1915	27	1,152.10	40,298,050	39,372,375
1916	15	559.26	14,476,000	10,849,200
1917	21	1,177.32	33,918,775	33,718,400
1918	29	2,107.61	92,130,388	163,257,102

It should be added that the receivership figures for 1917 have been adjusted to include the following cases, information about which was received too late for use in connection with last year's compilation: Abilene (Tex.) Street Railway—4.75 miles, \$25,000 of stock and \$30,000 of funded debt; Morgantown & Wheeling (W. Va.) Railway—27 miles, \$345,800 of stock and \$354,000 of funded debt; and Lewisburg (W. Va.) & Roncove Electric Railway—6.2 miles and \$50,000 of stock.

Table I presents the details of electric railway receiverships in the last calendar year. An effort was made in every case to secure figures from the most up-to-date and authoritative source, and to obtain the correct data in case of disagreement among financial reports, a not infrequent occurrence. The railways thrown into receivers' hands in 1918 were in the majority of cases small in mileage. In each of nine receiverships, however, 48 miles or more of single track were involved, and in each of the two leading cases, Pittsburgh and Brooklyn, more than 600 miles.

Most of the receiverships were caused by a default in interest due to the generally disappearing margin between revenues and expenses, or to operation in territory of a poor character or to inherent defects in organization, or to a combination of these conditions, but in certain instances special reasons existed. For example, the Brooklyn Rapid Transit Company was con-

fronted with large capital requirements for new construction, the possibility of heavy damages because of a recent severe accident, delay in the opening of vitally necessary sections of the new city rapid transit lines and opposition on the part of city officials to relief through a higher fare. The receivership in Des Moines was precipitated by a construction company after the company had for three months unsuccessfully tried to secure a higher fare. The Southern Traction Company, Inc., Bowling Green, Ky., was placed in receivership by the city, after service had been suspended, in order to prevent dismantlement if possible. Automobile compe-

of the Washington Electric Railway, Chehalis, Wash. The reason for the omission is that this company in 1916 disposed of its 19-mile line to the Cowlitz, Chehalis & Cascade Railway, which is now operating the line, and the receivership of the predecessor company is simply for the purpose of making a final settlement of its corporate affairs.

The foreclosure sales in 1918, as shown by the accompanying record for the past decade, were of more than average importance. Although the number of companies and the mileage involved were less than in 1917 (which year is adjusted to include the belated report of the South Fork-Portage Railway with 7.5 miles, \$150,000 of stock and \$230,000 of bonds), the capitalization in 1918 was greater. Moreover, the 1918 figures generally exceeded those for the other years before 1917 with the exception of 1910 and 1911. Two factors have undoubtedly tended during 1918 to keep the foreclosure sales from numbering even more than they did—first, the fact that financial conditions rendered difficult of accomplishment the readjustments that usually accompany the foreclosure sales of large properties and thus made advisable the continuation of some receiverships until more settled times; and second, the fact that more than a few companies deemed their situation so hopeless that they voluntarily went out of business without going through receivership and forced sale.

The detailed foreclosure sales are shown in Table II, in the preparation of which all the various forms of reorganization, readjustment and change in ownership without formal foreclosure sales were passed over. The

RECORD OF ELECTRIC RAILWAY FORECLOSURE SALES

	Number of Companies	Miles of Trunk	Outstanding Stock	Outstanding Funded Debt
1909	21	488.00	\$22,265,700	\$21,174,000
1910	22	724.36	19,104,615	26,374,065
1911	25	660.72	91,354,800	115,092,750
1912	18	267.18	14,197,300	10,685,250
1913	17	502.28	15,243,700	19,094,500
1914	11	181.26	26,239,700	44,054,241
1915	19	308.31	30,508,817	16,759,997
1916	19	430.14	13,895,400	22,702,300
1917	26	745.90	27,281,900	27,313,045
1918	23	524.22	37,740,325	20,149,384

tion brought the receivership of the Rockland, South Thomaston & St. George (Me.) Railway, and municipal restrictions that of the Fort Scott (Kan.) Gas & Electric Company, while the effort of the receiver of the Buffalo & Lake Erie Traction Company to abandon the lease of the Buffalo & Lackawanna Traction Company caused the latter company to be placed in the hands of a receiver.

A 1918 receivership not included in the list is that

TABLE I—ELECTRIC RAILWAY RECEIVERSHIPS IN 1918.

	Miles	Outstanding Stock	Outstanding Funded Debt
Binghamton (N. Y.) Ry.	49.74	\$978,995	\$2,390,000
Brooklyn (N. Y.) Rapid Transit Co.	754.82	75,571,368	119,588,927
Buffalo & Depew Ry., Buffalo, N. Y.	13.59	305,000	550,000
Buffalo & Lackawanna Traction Co., Erie, Pa. (a)	8.80	100,000	1,000,000
Claremont (N. H.) Railway & Lighting Co.	8.60	160,000	150,000
Columbus, Magnetic Springs & Northern Ry., Richmond, Ohio (b)	18.50	230,000	250,000
Consolidated Street Ry., Strong City, Kan.	2.00	10,000	None
Cumberland Ry., Carlisle, Pa.	12.40	30,000	404,700
Denver & Intercity R.R., Denver, Colo.	51.94	101,500	1,079,000
Des Moines (Ia.) City Ry.	85.00	1,305,000	5,995,000
Evansville (Ind.) Ry.	61.50	1,519,400	2,129,000
Fort Scott (Kan.) Gas & Electric Co. (c)	7.00	116,700	97,000
Hartford & Springfield Street Ry., Warehouse Point, Conn.	48.00	785,000	961,000
Iola (Kan.) Electric Ry.	10.50	150,000	150,000
Lewiston, Augusta & Waterville Street Ry., Lewiston, Me.	165.65	3,000,000	3,659,000
Memphis & Rugby (Tenn.) Ry.	2.50	80,800	None
Paducah (Ky.) Traction Co.	19.34	350,000	1,023,000
Penn Yan (N. Y.) & Lake Shore Ry., Pittsburgh (Pa.) Ry.	10.00	94,000	100,000
Plymouth & Sandwich (Mass.) Street Ry.	605.25	5,000,000	18,534,000
Rockland, South Thomaston & St. George Ry., Rockland, Me.	17.43	151,800	None
St. Joseph Valley Traction Co., Elkhardt, Ind.	9.00	110,200	240,000
St. Paul (Minn.) Southern Electric Ry., St. Petersburg (Fla.) & Gulf Ry.	17.54	658,225	364,400
Scranton (Pa.) & Binghamton R.R., Southwestern Interurban Ry., Winfield, Kan.	26.11	300,000	250,000
Southern Oregon Traction Co., Medford, Ore.	25.00	150,000	50,000
Southern Traction Co., Inc., Bowling Green, Ky. (d)	8.19	150,000	150,000
Springfield (Vt.) Electric Ry.	4.50	10,000	24,500
	9.07	100,800	100,000
	2,107.61	\$92,130,388	\$163,257,102

(a) Receivership resulted from petition of receiver of Buffalo & Lake Erie Traction Co. to abandon its lease of the Lackawanna line.

(b) Sale has been set for Jan. 15, 1919. See "Suspensions" in Table of Abandonments.

(c) Railway investment represents approximately one-third of company capitalization.

(d) This company suspended service in 1917, but the city has caused a resumption of service under a receiver.

TABLE II—ELECTRIC RAILWAY FORECLOSURE SALES IN 1918

	Miles	Outstanding Stock	Outstanding Funded Debt
Adirondack Lakes (N. Y.) Traction Co.	5.00	\$60,000	\$94,000
Central Crossown R.R., New York & N. Y. (a)	6.32	1,250,000	3,570,809
Cincinnati, Milford & Loveland (Ohio) Traction Co.	37.00	1,649,425	441,000
Claremont (N. H.) Ry. & Lighting Co., Consolidated Street Ry., Strong City, Kan.	8.60	160,000	150,000
Eastern New York R.R., Ballston Spa, N. Y.	2.00	10,000	None
Freeport (N. Y.) R.R.	15.00	275,000	150,000
Lewisburg & Roneverte Electric Ry., Lewisburg, W. Va.	2.92	20,000	50,000
Memphis & Rugby (Tenn.) Ry.	6.20	50,000	None
Minneapolis, St. Paul, Rochester & Northern Electric Traction Co. (b)	2.50	None	80,000
Northern Cambria Street Ry., Patton, Pa.	42.00	6,248,250	750,000
Northwestern Electric, Chicago, Cal.	13.00	431,750	395,000
Orleans-Kenner Electric Ry., New Orleans, La.	217.65	25,000,000	12,157,000
Petaluma & Santa Rosa (Cal.) Ry., Rockland, South Thomaston & St. George Ry., Rockland, Me.	11.60	250,000	250,000
St. Louis Valley Traction Co., Elkhardt, Ind.	43.41	994,100	872,000
St. Joseph, Lakewood & Grant Park (Mo.) Ry. (c)	5.71	122,400	37,575
San Angelo (Tex.) Power Street Ry. Co. (d)	9.00	110,200	240,000
Selma (Okla.) Street & Suburban Ry., Southwestern Interurban Ry., Winfield, Kan.	4.00	300,000	85,000
Ware & Brookfield (Mass.) Street Ry., Woodstock & Sycamore Traction Co., Genoa, Ill.	1.00	25,000	None
8.00	125,000	125,000	
25.00	150,000	50,000	
11.71	100,000	135,000	
26.50	292,600	485,000	
20.10	116,600	52,000	
	524.22	\$37,740,325	\$20,149,384

(a) The sale covered the lease of the Christopher & Tenth Street Railroad, which is included.

(b) A 14-mile section of this road was sold to bondholders in 1917 and included in the 1917 Table of Foreclosure Sales. The other part was sold in 1918 to an organization of citizens along the line. They bought in the 14-mile section and the whole property is now in the hands of a reorganized company, the Minneapolis, Northfield & Southern Railway.

(c) Not in operation since flood of 1915.

(d) This company abandoned service in 1916 and disposed of most of its 4-mile property. The remainder came into possession of the city under an agreed judgment of the district court and was sold in 1918 to the San Angelo Water, Light & Power Company. This company has related some track in connection with street paving but has not yet operated its 1 to 1 1/2 mile line.

items in the table generally speak for themselves, but a few special points merit comment. The Northern Electric Railway sale was the culmination of a reorganization pending since 1914. The part of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company not sold in 1917 was sold this year and, as explained in detail in the note in the table, has been reuniting in a new company with the other section. The Claremont (N. H.) Railway & Lighting Company was purchased by local manufacturers to save the line. The

majority of the properties foreclosed in 1918 are still operating in some reorganized or new form, but nine out of the total of twenty-three either went on to the junk dealer or seem headed in that direction.

These wrecked companies, together with those whose abandonment in 1918 was a voluntary act or the aftermath of receivership and sale in prior years, are shown in Table III. An effort was made to segregate abandoned companies into two classes, the first, or "Dismantlements," including properties actually scrapped in whole

TABLE III—ELECTRIC RAILWAY ABANDONMENTS IN 1918

I. Dismantlements				II. Suspensions			
	Miles	Outstanding Stock	Outstanding Funded Debt		Miles	Outstanding Stock	Outstanding Funded Debt
Adirondack Lakes (N. Y.) Traction Co.	5.00	\$60,000	\$94,000	San Jose (Fla.) Traction Co., Jacksonville, Fla.	3.00	\$50,000	None
Billings (Mont.) Traction Co. (a)	6.00	100,000	None	Taunton & Pawtucket Street Ry., Taunton, Mass., (b)	14.00	100,000	200,000
Bluffton (Ind.) Geneva & Celina Traction Co.	19.00	675,000	None	Topsfield (Kan.) Ry. Co.	11.00	45,000	39,600
Bristol (Conn.) Traction Co. et al.	15.30	143,800	192,500	Twin Falls (Ida.) R. R.	12.00	\$50,000	250,000
Carolina Traction Co., Rock Hill, S. C. (c)	3.00	.....	.....	Uvalde & Leona Valley (Tex.) Interurban Ry.	8.00	32,000	\$26,000
Charlestonville (Ga.) R. R.	11.25	.....	.....	Ware & Brookfield (Mass.) Street Ry.	11.71	100,000	135,000
Central of Florida Ry., Daytona, Fla.	5.00	130,000	100,000	Woodstock & Sycamore Traction Co., Genoa, Conn.	26.50	292,600	485,000
Consolidated Street Ry., Strong City, Kan.	2.00	10,000	None	Worcester & Warren Street Ry., Brookfield, Mass.	20.10	116,600	52,000
Cornice & Oxford (Ga.) Street Ry., Dayton, Springfield & Xenia Southern Ry., Dayton, Ohio (d)	12.00	159,425	150,100	Yazoo (Miss.) Municipal Street Ry.	4.00	.....	50,000
Dayton, Springfield & Xenia Southern Ry., Dayton, Ohio (d)	12.00	159,425	150,100				
Delaware Valley Traction Co., Gettysburg (Pa.) Ry.	6.50	50,000	47,000				
Interurban Ry. & Terminal Co., Cincinnati, Ohio	23.00	946,750	446,325				
Lake Erie, Bowling Green & Napoleon Ry., Bowling Green, Ohio (e)	12.50	346,000	218,600				
London & Lake Erie Ry. & Transportation Co., London, Ont.	28.00	2,000,000	840,000				
Martha's Vineyard (Mass.) Street Ry., Martha's Vineyard (Mass.) Street Ry., Memphis & Rugby (Tenn.) Ry.	1.10	8,000	None				
Middletown (Ohio) Street Ry.	1.00	.....	80,000				
Montecito R. R., Los Angeles, Cal.	1.46	20,000	None				
New Jersey Rapid Transit Co., Sea Beach, N. J.	8.00	200,000	120,000				
Northwestern Traction Co., Brazil, North Dakota	5.00	.....	.....		
Normal, Canton & Sharon Street Ry., Foxboro, Mass. (Norwood Division) (f)	2.50	12,500	11,500				
Oak Hills (Mass.) Street Ry.	4.37	60,000	None				
Oklahoma Union Ry., Sapulpa, Okla.	1.50	24,000	.....			
Oklahoma (Va.) & Rappahannock River Ry. (g)	16.30	321,000	314,580				
Rockland, South Thomaston & St. George Ry., Rockland, Me.	5.71	122,400	37,575				
Rutland Ry., Light & Power Co., Rutland, Vt.	12.50	120,000	75,000				
St. Joseph Valley Traction Co., Elkhardt, Ind. (h)	7.50	110,200	240,000				
St. Louis, Lakewood & Grant Park Ry. (i)	4.00	300,000	85,000				
St. Simons R. R., Brunswick, Ga.	1.70	12,000	18,000				
Sand Point (Ida.) & Interurban Ry., Ida.	6.00	312,100	None				
Sioux City, Crystal Lake & Homer Elec. Ry., Dakota City, Neb.	4.00	50,000	10,300				

* Authorized amount; outstanding amount not ascertainable.
 † This represents only a small fractional abandonment; in other words, almost all of the old mileage of this company is still in operation.
 (a) Partially dismantled in 1917 by heirs of chief stockholder refuse to operate losing line, and the property remaining is for sale.
 (b) This company suspended service in 1917. Early in 1918 an effort was made to restore the existing line to the Huntington Valley division, but now this and the city lines have both been dismantled.
 (c) The company's three storage battery cars have been sold, but the tracks and charging plant have not yet been removed.
 (d) The branch line from Beavertown to Spring Valley has been torn up. The company's remaining trackage, 27.97 miles, is being operated.
 (e) Dismantled section represents Bethel division only. The company still operates 62 miles.
 (f) The company was sold in 1916, with the option to junk. The 12-mile section between Bowling Green and Pemberville was sold to and is being operated by the Toledo, Fostoria & Findlay Railway. Dismantlement was begun on the remaining part, but the final authorization for junking was not received from the Ohio Supreme Court until 1918.
 (g) Same company as in "Suspensions" below. Service on the whole 6.5 mile line was suspended in March, and in this month the company was sold, not at public auction, to a New Jersey syndicate represented by a Mr. Farr of New York. The 2.1 mile division now foreclosed division has been junked, but the 4.4-mile Sharon division lies untouched at the moment.
 (h) Abandoned under commission order because controlled Sapulpa Electric Interurban Railway served same territory for slightly greater distance.
 (i) A 9.10 mile section of this 25.40 mile property, which went into receivership in 1917, was sold under court decree in 1917 to the Richmond & Seven Pines Railway. The remainder is now abandoned as the result of the voluntary discontinuance of the Richmond & Rappahannock Railway.
 (j) See this company in Table of Receiverships and Table of Foreclosure Sales, which was sold to a banking company, but W. H. Foster, mayor of Elkhardt, purchased a 1/2 mile section in that city and is now operating it.
 (k) Not in operation since flood of 1915.
 (l) This company, 17.5 miles long, was sold in 1917 under the unassisted mortgage of the predecessor company, the Bristol County Street Railway, and all has now been abandoned except a 3.5 mile section purchased by the city of Andover for \$18,000 to form the "A. R. C. Railway."
 (m) On March 1, 1918, the city of Andover authorized the discontinuance of 125 mi. of unprofitable lines, but up to the latest report furnished only 30.4 of unsafe track had actually been closed down. A petition, however, for the discontinuance of 288.2

miles at least during the winter months because of failure to earn operating expenses is now pending.
 (n) Operation temporarily suspended on line from Lanesboro to Cheshire. Capitalization represented is arbitrarily halved between stock and bonds. Line from East Lee to Huntington, 23.84 miles, is not included as the express service is still in operation, although all passenger service has been discontinued.
 (o) This line was sold for junk in 1917 and included in the Table of Abandonments of that year. The dismantling, however, was stopped late in 1918 by an injunction from the Ohio Supreme Court.
 (p) See "Complete suspension" in "Dismantlements" above. The company last March was notified not to resume operation until re-inspected by the Massachusetts Public Service Commission, for the roadbed was said to be in a dangerous condition.
 (q) Company suspended service in October, 1918, and says that it will not operate again. Committee of local business men is trying to interest capital for purchase of the property.
 (r) It is expected that this suspension will result finally in dismantlement and sale.
 (s) Sale is awaiting decision by federal courts; receiver, who has been in power since that line was dismantled.
 (t) Property is awaiting decision of Massachusetts Supreme Court relative to writ of mandamus to compel town of Plymouth to keep its promise to pay the cost of construction of 11.5 mile extension (total cost, \$250,000) from Fresh Pond to Sagamore completed in 1916. Town voted to contribute this sum, but selectmen refused to vote, and service was suspended pending settlement of matter in the courts.

Total dismantlements	327.10	\$7,542,975	\$4,318,000
2. Suspensions			
Bay State (Mass.) Street Ry. (l)	130.40	\$834,000	\$827,700
Berkshire (Mass.) Street Ry. (m)	15.05	69,215	69,215
Bristol & Norfolk Street Ry., Randolph, Mass. (n, m)	6.44	100,000	70,000
Columbus, Magnetic Springs & Northern Ry., Richwood, Ohio (o)	18.50	230,000	250,000
Conway (Mass.) Electric Street Ry., Ferrisburgh, Vt.	6.60	100,000	100,000
Fernandina (Fla.) Municipal Ry., Genoa, Conn. (k), Gas & Electric Co. (o)	2.00	.....	None
Fryeburg (Me.) Horse R. R. (p)	7.00	116,700	97,000
Hamilton (Ont.) Radial Elec. Ry. (pp)	3.00	5,175	None
Oxford Electric Co., Norway, Me. (q)	11.30	111,150	160,000
Lebanon & Franklin Traction Co., Dayton, Ohio	10.80	80,000	135,000
Madison Light & Ry. Co., Madison, Ind. (r)	3.50	150,000	146,000
Mt. Vernon (Ohio) Ry. (s)	9.00	10,000	40,000
Norwood, Canton, Sharon Street Ry., Foxboro, Mass. (Sharon Div.) (t)	4.00	20,000	18,500
Ocean City (N. J.) Electric R. R. (u)	10.00	100,000	75,000
Oxford Electric Co., Norway, Me. (v)	2.13	80,000	175,000
Parkersburg (W. Va.) & Ohio Electric Ry. (w)	5.00	150,000	150,000
Plymouth & Sandwich (Mass.) Street Ry. (x)	17.43	151,800	None
Total suspensions	171.25	\$2,328,620	\$2,332,665
Grand total	498.35	\$9,871,595	\$6,650,745

or in part, in the process of being so scrapped or with the necessary legal sanction for such treatment, as well as certain small companies which are known to be out of business and of which nothing can be learned to give hope of a reopening. The second class, or "Suspensions," includes those companies whose service has been in whole or in part discontinued either temporarily or permanently, but which in the latter event have not received the necessary permission for dismantlement.

In 1918 the number of companies involved in dismantlements and suspensions was about three times as large as in 1917, and the mileage and the capitalization concerned were about two-and-a-half times as great. The following record of the last two years tells a plain story of increased burdens:

	Number of Companies	Miles of Track	Outstanding Stock	Outstanding Funded Debt	
1917	Dismantlements.....	13	126.97	\$2,048,900	\$2,006,450
	Suspensions.....	7	80.51	1,173,300	1,542,000
	Total.....	20	207.48	\$3,222,200	\$3,548,450
1918	Dismantlements.....	41	327.10	\$7,542,975	\$4,318,080
	Suspensions.....	18	171.25	2,328,620	2,332,665
	Total.....	59	498.35	\$9,871,595	\$6,650,745

It will be observed that Table III includes a few operating companies which—the Bay State Street Railway is the leading example—abandoned a small part of their lines in 1918 and even in some cases scrapped this part of their properties. The list of cases of this sort is not intended to be complete, for no canvass has been made of all operating companies to ascertain to the last inch how much track has been torn up or allowed to become a streak of rust. The cases cited are those which have attained prominence before commissions, courts or city authorities, and they are included merely to indicate the necessity which companies feel of curtailing unprofitable service. The capitalization in these cases is reported on a mileage basis.

Regarding the seven companies reported in last year's list of suspensions, it may be said that three have since been dismantled, the Bristol (Tenn.) Traction Company, the Bluffton, Geneva & Celina Traction Company and the Taunton & Pawtucket Street Railway. The Richmond & Chesapeake Bay Railway has not resumed service, but at a recent sale all bids were refused because no one would state an intention to operate the line. The Fort Smith-Oklahoma Light & Traction Company is likewise still existent but inoperative, and there is said to be no indication of a resumption of service in the near future. As before stated, the Southern Traction Company, Inc., Bowling Green, Ky., is being operated by a receiver. The Amarillo (Tex.) Street Railway has not yet resumed operation.

The special circumstances attaching to individual cases of dismantlement or suspension in the 1918 table are believed to be sufficiently explained in the notes, but a few references to companies not included in the table will be used to complete the story as follows:

The 1917 purchasers of the Southwestern Traction Company, Temple, Tex., have been desirous of dismantling the property, but suspension of operation has been prevented by an injunction secured by citizens, city councils and county officials in the company's territory.

The Gary & Interurban Railroad, Gary, Ind., sold in 1917, was succeeded by the Gary Street Railway as far as the original Gary & Interurban and the controlled

East Chicago Street Railway lines were concerned. A third constituent part of the old system, the Goshen, South Bend & Chicago Railway, was included in the 1917 Table of Abandonments; and the remaining sections, the Gary Connecting Railways and the Valparaiso & Northern Railway, seemed destined also to meet an early end. The Gary & Valparaiso Railroad, however, was incorporated to operate these last two lines pending an appeal to restrain dismantlement, and during 1918 this company has been aided by the government in its rehabilitation work, as described elsewhere in this issue.

The Dunkirk (N. Y.) Street Railway, after repeated efforts, has at last secured permission from the Public Service Commission for the Second District of New York to abandon parts of its system, with an "if" attached. The commission's order is not to become effective until certain security is given to the city for taxes and until the receiver of the holding company, the Buffalo & Lake Erie Traction Company, obtains authorization from the Supreme Court for the abandonment.

The California Railroad Commission has just granted the owners of the Fresno Interurban Railway the right to suspend passenger service on its line in the city of Fresno. Like the Berkshire Street Railway line noted in Table III, however, the Fresno company is not included in the list of suspensions because some class of service is still maintained, this being freight service to the end of its 15-mile line.

In New York State numerous petitions have been presented to the Second District Commission for approval of declarations to abandon parts of lines. The Fishkill Electric Railway, the New York, Westchester & Connecticut Traction Company, the Yonkers Railroad and the Westchester Electric Railroad have all taken this step, but the applications are still pending. The three companies last named are controlled by the Third Avenue Railway, New York, N. Y.

Other petitions for the abandonment of certain portions of the property are pending before the courts or the commissioners in the cases of the Danbury & Bethel (Conn.) Street Railway; the Washington Water Power Company, Spokane, Wash.; the Los Angeles (Cal.) Railway; the Kansas Electric Utilities Company (Parsons Division), and the Exeter, Hampton & Amesbury Street Railway, Exeter, N. H. In addition the Indiana Utilities Company has a case pending before the State commission for the abandonment of the Angola-Lake James railway property, and the Los Angeles & San Diego Beach Railway one before the California Railroad Commission for complete discontinuance of service and dismantlement.

The twelfth year of operation of the tramways in Penang, Straits Settlement, was somewhat uneventful, the usual services being maintained without accident or serious interruption. The revenue totaled \$87,275 (gold), and the gross profit was 10 per cent. The number of passengers carried showed a satisfactory increase, but enhanced prices had to be paid for all materials, and no work of a capital nature was carried on owing to the impossibility of obtaining materials. An electric locomotive to deal with freight haulage was ordered from America.

Electric Railway Statistics

Figures Are Given by States of the Miles of Track and Numbers of Cars Owned

THE accompanying table gives statistics of the miles of track and cars of the electric railway companies in the United States, made up from the August, 1918, "Electric Railway Directory" of the McGraw-Hill Company. The dates of the reports in this directory average about June, 1918, so that the table may be considered to represent the statistics of the industry at about that time.

A comparison of the totals given in this table with those in a somewhat similar table, published in the issue of Jan. 5, 1918, will show that for all states a total of 991 companies instead of 1,029, a decrease during the year of 38. The miles of track this year total 48,484 as compared with 48,175 in June, 1917, an increase during the year of 209, and the motor passenger cars this year total 80,270 as compared with 81,393, last year, a decrease of 1,123. The total number of cars, according to the table, increased from 102,359 to 102,379, or a total of 20. The decrease in the number of companies is due in part to the abandonment of operation of electric lines by companies which had not found the service financially profitable, and in a number of cases to the abandonment of gasoline motor lines. There were a few consolidations and also several cases of the splitting up of former consolidated properties by action of the court or for some other reason. Some of these cases of segregation have brought changes in the mileage credited to the different states, because, under the plan followed, the miles of track and number of cars belonging to each company are credited to the state in which the greater part of the mileage lies. Nominally there has been an increase of 200 miles, but this increase is not significant, in the opinion of the compilers, as it is less than one-half of 1 per cent, and owing to the unavoidable limitations in the method of compiling the statistics, accuracy within that figure is not claimed. The same statement applies to the figures on cars. This is one reason why an attempt should not be made to establish a very close comparison between the figures in this table and in those elsewhere in this issue on track built and abandoned and cars purchased during the year. Another reason of course is the difference in period, the other tables being for the calendar year while these are approximately for the year ended in June. The figures do not differ greatly, however, indicating that all are approximately correct.

A few other words of explanation are necessary. The electrified mileage of steam railroads is included, but as this is reported to the Directory usually as route mileage, that figure is continued in the table, although the mileage of the city and interurban companies is figured as single track as usual. Under "Cars" the statistics include for electrified steam railroads only the electric locomotives and the motor passenger cars. Gasoline motor cars are classified under the head of "motor passenger cars."

Many companies seem to use the expressions "express cars," "freight cars," and "service cars" as interchangeable terms. The table shows the way in which cars of these types are reported by the different companies, but what is known as a service car on one road may be called

a freight car or an express car by another road. In a few cases where a company owns a large number of freight cars compared with the number of passenger cars owned, the total number of such freight cars has been intentionally omitted from the table. The most notable instances of this are the Chicago Tunnel Company with 3000 "other" cars, the Fort Dodge, Des Moines & Southern Railway with 2,800 "other" cars and the East St. Louis & Belleville Electric Railway with 510 "coal" cars. In fact, "other cars" as reported by a company may mean almost anything other than motor cars.

Every effort was made to prevent duplication of mileage and cars when reported by a holding company and again by an operating company, but there may be certain cases of this in the table.

TABLE SHOWING STATISTICS OF ELECTRIC RAILWAY COMPANIES IN THE UNITED STATES

	No. of Cars	Miles of Track	Motor Passenger Cars	Trial Passenger Cars	Electric Locomotives	Express or Light Motor Car	Freight Cars	Service or Other Cars	House or Cable Cars
<i>New England States:</i>									
Connecticut.....	7	1,608	1,922	3	104	300	.....	123	.....
Maine.....	16	535	511	.....	11	85	30	151	.....
Massachusetts.....	39	3,227	7,873	354	9	29	33	1,076	.....
New Hampshire.....	3	248	285	.....	2	6	.....	41	2
Rhode Island.....	3	428	1,030	25	.....	.....	.....	246	.....
Vermont.....	10	128	151	.....	.....	1	12	14	.....
Total.....	89	6,174	11,752	390	126	421	75	1,651	2
<i>Eastern States:</i>									
Delaware.....	2	153	309	.....	.....	.....	.....	81	.....
District of Columbia.....	8	425	1,066	54	.....	.....	.....	438	.....
Maryland.....	12	685	2,114	54	.....	19	70	92	.....
New Jersey.....	29	1,595	3,285	.....	.....	2	19	4	77
New York.....	105	5,633	16,989	1,228	151	62	35	2,116	2
Pennsylvania.....	122	4,746	8,154	23	3	24	86	1,165	4
Virginia.....	13	381	891	63	.....	12	14	317	.....
West Virginia.....	21	652	574	.....	.....	.....	5	117	.....
Total.....	312	14,470	33,382	1,371	181	161	200	4,339	6
<i>Central States:</i>									
Illinois.....	70	3,737	5,999	701	52	9	1,125	517	.....
Indiana.....	41	2,465	1,730	28	39	85	.....	455	.....
Iowa.....	24	885	967	13	16	3	.....	354	.....
Kentucky.....	10	464	1,005	14	.....	12	.....	70	.....
Michigan.....	26	1,736	2,384	57	16	80	.....	598	.....
Minnesota.....	14	737	1,320	4	7	1	.....	171	.....
Missouri.....	22	1,137	2,512	144	1	.....	59	285	.....
Ohio.....	72	4,234	5,501	89	14	59	24	1,285	.....
Wisconsin.....	18	763	913	117	2	67	.....	79	.....
Total.....	297	16,196	22,331	1,167	147	316	1,149	3,614	2
<i>Southern States:</i>									
Alabama.....	15	365	411	28	.....	.....	.....	248	.....
Arkansas.....	10	122	242	13	.....	.....	.....	44	.....
Florida.....	9	191	289	23	.....	1	.....	41	.....
Georgia.....	16	499	679	19	.....	26	.....	58	2
Louisiana.....	61	330	687	.....	.....	3	.....	135	.....
Mississippi.....	11	120	150	2	.....	.....	.....	24	.....
North Carolina.....	12	285	314	.....	16	1	.....	8	195
South Carolina.....	5	129	188	25	.....	.....	.....	3	74
Tennessee.....	14	482	799	57	1	13	3	.....	.....
Total.....	103	2,523	3,759	144	17	44	11	819	2
<i>Western States:</i>									
Arizona.....	4	54	44	1	.....	.....	.....	.....	.....
California.....	38	3,313	3,733	84	66	9	467	1,531	119
Colorado.....	13	494	415	149	6	57	.....	206	2
Idaho.....	5	185	61	2	3	.....	.....	.....	.....
Kansas.....	17	546	411	14	.....	.....	12	157	3
Montana.....	9	663	134	20	42	32	.....	17	.....
Nebraska.....	6	253	578	10	1	.....	.....	65	.....
Nebraska.....	2	11	12	.....	.....	.....	.....	.....	.....
Nevada.....	2	11	16	.....	.....	.....	.....	.....	.....
New Mexico.....	4	27	58	.....	.....	.....	.....	8	.....
North Dakota.....	16	312	301	.....	.....	.....	.....	73	.....
Oklahoma.....	10	682	721	85	22	26	449	206	.....
Oregon.....	3	25	30	4	.....	.....	.....	.....	.....
South Dakota.....	3	25	30	4	.....	.....	.....	.....	.....
Texas.....	34	1,001	1,221	134	7	2	31	163	.....
Utah.....	5	453	669	.....	.....	.....	.....	251	.....
Washington.....	20	1,069	1,027	28	27	7	442	483	48
Wyoming.....	2	22	15	10	.....	.....	.....	4	.....
Total.....	190	9,121	9,046	541	174	165	1,310	3,194	172
Total of all States.....	991	48,484	80,270	3,613	645	1,107	2,745	13,817	182

Railway Conditions are Encouraging

War Has Proved Need of Public for Dependable Service—Some Sort of Service-at-Cost Plan of Operation Favored

BY CLARENCE RENSHAW

General Engineer Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

THE beginning of the new year on a peace basis finds the electric railways with much to be thankful for. While in many cases their revenues are shamefully inadequate, their physical property run down and their working forces depleted by the severe strains they have been through, there is every reason to believe that the bottom has at last been reached, and that the future will bring improvement.

The war has brought many hardships to the industry, but it has also destroyed several handicapping prejudices which had seemed so deep-rooted as to be almost impregnable, and in their place it has established some valuable precedents. Its effects, therefore, have not been entirely without compensation.

Among the most important of the ideas which have been relegated to the past is the mysterious idealization of the nickel as the necessarily logical unit of car fare and the strong conviction that only a single unit should be charged within the boundaries of a given municipality, no matter how great the mileage. The necessity for stopping the cars at every street corner, also, regardless of the fact that in many cases these corners are only five or six car lengths apart, has likewise been removed and a rational basis generally recognized for the location of stopping points.

IMPORTANT PRECEDENTS ESTABLISHED

In the matter of precedents the national recognition which has been given to the necessities of the electric railways and to the value of their services is an important item. It is stated on reliable authority that of the 158 cities having a population of 40,000 or more, increased rates in one form or another have been granted in ninety, or nearly 60 per cent, and that they are pending in fifty-one others. In many instances, it is true, the granting to the railway companies of the increased rates for which they asked has not proved a solution of their financial problems. However, the recognition of the fact that rates must be adjusted to meet costs, which these increases have shown, is extremely encouraging, especially in view of the idea previously prevalent that fares could be changed in the downward direction only.

The most convincing testimonial, perhaps, as to the value of local transportation has been the loaning to electric railways in various parts of the country, by at least two different departments of the national government, of money at reasonable interest where such financing was necessary to secure service for important industries. Another encouraging recognition of the same sort was the practice adopted by manufacturers in many cases of loaning men from their own forces to the railway companies for operating cars during the rush hours. The difference between the amounts paid these men by their employers and those refunded by the railway companies, often amounting to nearly \$5 a day per car, was cheerfully assumed under the circumstances as a legitimate charge for readiness to serve. These prac-

tices, moreover, are not merely recognitions of service. They are precedents which will be carefully borne in mind on account of their possible bearing on the ultimate solution of the transportation problem.

With such a background, there is every reason why the electric railways should attack their problems in a spirit of optimism. Never before has the idea of justice and fairness been so noticeable among the people and their representatives as now at the conclusion of a war entered for the sake of these principles. Never before has the management of the railways been controlled by such broad-minded and skillful executives, and never before have the manufacturers of equipment been so adequately prepared to supply the physical needs of the industry. What the results will be it would, of course, be rash to predict. Certain tendencies, however, can be recognized with a fair degree of certainty.

TENDENCY IS TOWARD SERVICE AT FAIR RATES

The general trend in public relations will apparently be away from the municipal franchise with its iron-clad provisions and toward state control by the more flexible commission form. In those cases where previous relations have been severely strained, the tendency will be to adopt some form of service at cost with more or less fixed guarantees of capital return. Where conditions have been better, however, and proper technical skill is utilized, it will most likely be feasible to devise means for profitable operation under present forms of control.

To operate successfully under the latter alternative, commercial methods must be more generally adopted. Service of the proper kind, not too much nor too little, but rightly gaged to the needs of the community, must not only be given but must be widely advertised. Reliable, rather than cheap equipment, must be employed with train operation, one-man cars and other modern devices where necessary. Obviously, this will mean highly-trained men in both traffic and mechanical departments. Rates properly proportioned to encourage maximum use of the transportation for sale will likewise be an essential element. Restrictive legislation will not handicap any railway which operates on this basis, for, presenting the case in its bearing on service to the people rather than its effect on the company, it will be able to secure any enactment for which it asks.

On either basis the electric railways in the future will undoubtedly be run for the benefit of the community, and this being properly made known with suitable publicity of all matters of management, the people will be entirely willing to pay the necessary price.

The importance of studying the employees outside of working hours was emphasized in some remarks recently made by Edward Marshall before the station operating committee of the Ohio Electric Light Association. He said, "Do you think most of us give our help the proper consideration and attention? Should we not have in each plant some one whose duty it is to investigate each employee's home life and the conditions under which he labors? Should we not know whether our employees are living economically? We all know that a man in debt is not a good employee. Some system of education and relief for such should be provided."

Renewing "K" Controller Shafts and Handles

The Position of Controller Contacts Should Be Located Accurately from the Machined Portion of the Shaft

By R. S. BEERS

General Electric Company, Schenectady, N. Y.

THE handles of most "K" controllers are made removable, which requires that the hole in the handle be slightly larger than the shaft. The continual use of the operating handle increases this difference in size, until in extreme cases the fit may become so loose that the controller cannot be turned fully "on" or "off." Usually, rebushing the handle will be found sufficient to correct the trouble.

But in other cases where the shaft is badly worn it may be brought back to its original dimensions by cut-

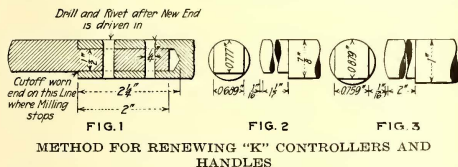


Fig. 1—Method of renewing handle fit on controller shaft. Fig. 2—Handle end of shaft for K-10, K-11, K-12, K-27 and K-63 controllers. Fig. 3—Handle end of shaft for K-6, K-28, K-29, K-36, K-36, K-40, K-51 and K-66 controllers

ting off the worn end and drilling a hole to receive a new shaft end as indicated by Fig. 1. The part that goes in the hole of the old shaft should be turned to a drive fit.

A simple plan for locating the new shaft end is to put the cylinder in a controller frame, with the pawl in the "off-position" notch of the star wheel. Then the new shaft end is put into a new handle, the handle is set in the "off position" as indicated by the "off-position" stop on the cap plate and the new shaft end is driven into place. After it is driven in, the shaft is removed and drilled and the new end is pinned to the old shaft. This method of repairing removes the oil-way to the upper bearing but a substitute oil-way can be made by drilling a small hole through the water cap.

A second and much more difficult method of repair is to build up the shaft end with a welding outfit. This has the advantage of maintaining the original strength of the shaft as well as the oil-way to the upper bearing. It has the disadvantage, however, of requiring that, while the weld is being made, the shaft be kept cool where the insulation begins. In addition it is necessary, on the repaired cylinder, to machine the end for the handle in a milling machine having an index head, or else an angle plate and surface gage must be used. Care must be taken to insure that the flat surface for the handle will be correctly located.

In the manufacture of controller cylinders the milled end for the handle-fit is located by measuring from one of the flat sides of the hexagon or, in the case of the round-shaft type, from the keyway. All other angular distances such as those to segment screw holes and star-wheel notches are located from this milled end. Where a new end for the handle is to be made the operation

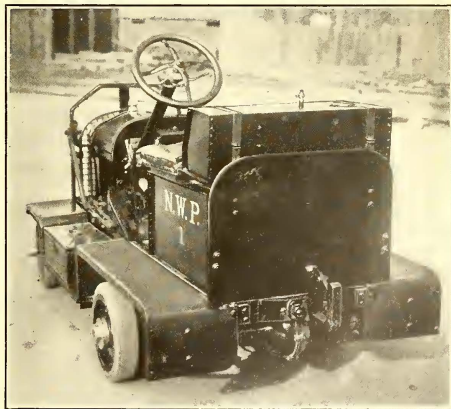
should be reversed, in the following manner: Take a new cylinder and determine the angular distance from a segment screw hole to one of the milled surfaces and use the distance for locating this surface on a repaired cylinder. Fig. 2 gives the dimensions of the handle end of the main cylinder shaft for the K-10, K-11, K-12, K-27 and K-63 controllers. Fig. 3 gives similar dimensions for the K-6, K-28, K-29, K-35, K-36, K-40, K-51 and K-66 controllers.

Recently several handles have been put on the market that are provided with an adjustment to take up the wear on old controller shafts. At the present time the manufacturers of "K" controllers furnish such a handle with their standard equipments. This particular one is known as a "wedge-lock handle," because the wear is taken up by a wedge forced into place by a spring.

Tractor Made from Rebuilt Ford Expedites Terminal Work

FOR use at the Sausalito terminal of the Northwestern Pacific Railroad in California, Model T. Ford automobiles have been rebuilt into tractors for conveying mail, baggage and express trucks from boats to trains and vice versa. The tractors have now been in operation for about a year and are said to have reduced the time as well as the man power required for the transfer between rail and water. Their operation is reported to be very economical.

The tractors have a tread narrower than the automobile standard, the new axles being made of the same length as those on the baggage trucks. The original rear axles were cut down so as not to project. The new rear axle is set ahead of the original and is driven by chain and sprocket on each end, thus permitting the use



TRACTOR FOR BAGGAGE, MAIL AND EXPRESS TRUCKS

of the differential just as arranged for the standard car. The diameter of the front wheels is 14 in. and of the rear wheels 12 in., solid rubber tires being provided throughout. A large water tank was built in under the seat so that the total weight of the machine could be brought up to 1900 lb. This was considered necessary as at low tide considerable traction is required in draw-

ing a string of loaded trucks up the inclined apron from the boat. The fuel tank was set on top of the water tank, arranged as a back rest for the operator.

The speedy transfer from boat to train is important at this point because it is the custom for the mail and express to be taken from the front end of the boat before the passengers are permitted to land. This makes possible transfer from the trucks into the trains while the passenger coaches are filling up, and thus trains can pull out quicker than if the trucks were not taken from the boat until the passengers were ashore. Making the passengers wait, however, did not gain popularity for the system, particularly when the baggage trucks had to be pulled up an incline, one at a time, in front of the waiting throng. Since the advent of the tractors the passengers are released much quicker as a tractor backs onto the boat immediately the apron is lowered and all of the trucks are coupled on and taken off in a single trip. The tractors are provided with a very convenient coupling device, as shown in the accompanying view, which automatically locks over the baggage truck handle when the latter is hastily thrust into place. The tractors were built in the shops of the Northwestern Pacific Railroad under the direction of J. K. Brassil, superintendent.

Some Facts About Monel Metal

IN A RECENT issue, London *Engineering* gives some valuable data regarding monel metal, for which many uses are now being found. Readers of the ELECTRIC RAILWAY JOURNAL will remember that one of the earliest electric railway uses was in the resistance strips connecting the armature windings and commutator bars in the single-phase railway motor. According to the *Engineering* article, the ore from which the metal is produced is mined at Sudbury, Canada, and it is called a "natural alloy" in that the proportions of the constituents are about the same in the refined alloy as in the original ore. Roughly, the composition is as follows: Nickel, 66 per cent, copper 29 per cent, manganese and iron, 3½ per cent, silicon from 0.1 to 1½ per cent. Traces of phosphorus, sulphur and aluminum are also present.

The tensile strength of the metal is about 80,000 lb. per square inch and the yield point about 40,000 lb. The strength of the metal is largely "natural" and does not depend much upon the physical treatment. The structure is a solid solution, and the rolled metal shows sharply defined crystal grains, usually twined. The cast material shows only the cord arrangements found in such alloys as German silver. The metal has been largely used on account of the strength which it possesses at high temperature.

According to a report presented to the Dover (England) Tramways Committee recently by Dick, Kerr & Company, the corporation tramways in that city are in bad shape. As a result of failure to provide proper allowance for maintenance the corporation is faced with the alternative of spending a considerable sum of money at a time when materials are very expensive or selling the whole equipment as scrap. In commenting on this situation the *Electrician* notes that the tramways have literally been starved as regards upkeep.

Chipping and Sand Blasting of Glass at Omaha

Cost of Chipping Is Reduced 85 Per cent—
Sand Blasting Equipment Made
In Shop

THE Omaha & Council Bluffs Street Railway, Omaha, Neb., uses chipped glass quite extensively in the various windows of some of its rolling stock. Like any other glass this is subject to constant breakage, and to replace at the market price would make quite an item

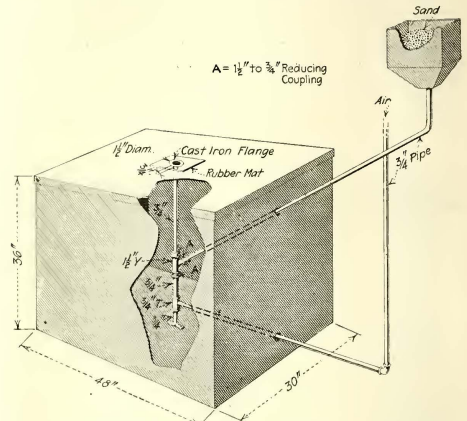


FIG. 1—SAND BLASTING EQUIPMENT MADE IN OMAHA SHOPS

of expense, as chipped glass costs about 40 cents per square foot.

As a matter of economy the company does all of its own glass chipping. The glass is cut entirely from scrap material, and the work is done during the winter months when there are not enough cars in the shop to keep the men busy. A piece of heavy brown paper is pasted around the edge to give a clear edge, and then the glass is covered with a coating of carpenters' glue. When the glue dries the glass chips off with it. This offers a salvage for all scrap glass, and costs about 6 cents a square foot for labor.

Instead of painting signs and instructions on the



FIG. 2—SAMPLES OF GLASS SAND BLASTING AND CHIPPING DONE AT OMAHA

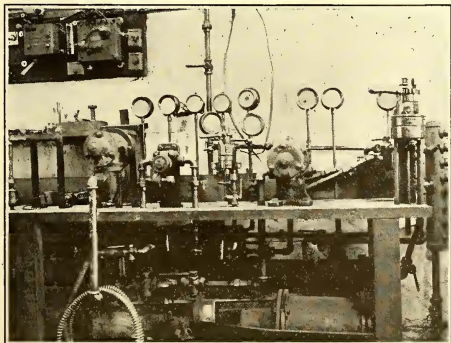
glass car doors and bulkhead windows, to be washed off in cleaning, the Omaha company sand blasts the words into the glass. Many fancy borders are also put on in this way. The lettering is put on by pasting heavy brown paper over the glass, using a templet and pounce bag, and cutting the letters out with a sharp knife. The glass is then ready for the sand blast.

The sand blaster shown in the accompanying sketch, Fig. 1, is a simple piece of equipment made in the railway shops at very slight expense. Sand feeds by gravity from a galvanized iron-box through a $\frac{3}{4}$ -in. pipe into a $1\frac{1}{2}$ -in. V. Air entering through a $\frac{3}{4}$ -in. pipe passes through a $\frac{3}{4}$ -in. T to the $1\frac{1}{2}$ -in. Y, and forces the sand up through a $\frac{3}{4}$ -in. nozzle pipe. A piece of $\frac{3}{4}$ -in. pipe with the end sealed is screwed into the lower end of the T, and the pipe is split, forming a standard, which is screwed inside the bottom of a box 30 in. x 48 x 3 ft. high. The end of the $\frac{3}{4}$ -in. nozzle pipe is $\frac{3}{4}$ in. below the lid of the box, and directly over the pipe is a hole $1\frac{1}{2}$ in. in diameter. A square piece of rubber matting on the top of the lid serves as a cushion for the glass, and the edge of the hole is lined with a cast-iron flange.

The Omaha company not only does all of its own work, but also handles some commercial work for outside interests. A sample of both the sand blasting and the chipping is shown in Fig. 2.

Compact Testing Stand for Air-Brake Valves

RAILWAY companies using air brakes, particularly automatic air brakes, find it necessary to provide means for testing triple valves, feed valves, operating valves, etc., and various kinds of testing stands are in use. A compact stand, shown in the accompanying



AIR BRAKE VALVE TESTING STAND AT
FREMONT, OHIO

photograph, is used in the Fremont, Ohio, shops of the Lake Shore Electric Railway.

In this arrangement the air-brake cylinder and reservoir, with piping, are mounted under the table and the valves are placed at a height convenient for inspection and adjustment above it. Gages are tapped in at points necessary to show the condition of all parts of the equipment when the brake application is made.

LETTER TO THE EDITORS

The "Latest" in Arc Welding

ARC WELDING MACHINE COMPANY, INC.

NEW YORK, N. Y., DEC. 27, 1918.

To the Editors:

We have read your resumé of the report of subcommittee A on welding of the Association of Railway Electrical Engineers. This report undoubtedly represents standard practice of to-day. However, it does not by any means represent the LATEST practice, as the title of your abstract seems to indicate.

Several new developments in arc-welding equipment have been put on the market in the last few years, that are not even mentioned in this report, probably, because they have not come into any extensive use, although one of them has been used extensively in railway jobs.

I refer to the alternating-current welding transformer, the 35-volt generator with automatically regulated resistance in series with the arc, and the constant-current closed-circuit system. All of these systems eliminate the major portion of the power loss, which is the chief objection to the constant-potential system. Two of these systems provide automatic control of the current, and one of them gives voltage limitation. Therefore, no article under the head of "latest practice" would be complete, without including a description of these three systems.

O. A. KENYON, Chief Engineer.

Campaign for Public Works Construction

A GREAT building campaign, involving the construction of highways, public works of other character, homes and public utilities, is about to be undertaken by the government, largely for the purpose of making certain that employment will be found for demobilized soldiers. An organization to conduct the campaign is now being created in Washington, with headquarters at 16 Jackson Place, under the general supervision of Secretary Wilson of the Department of Labor, with the co-operation of the American Federation of Labor and other labor interests. The following slogan for the campaign has been adopted: "Build now for greater and better America. A billion for roads; two billions for public works; three billions for a million new American homes. What are you doing to help this campaign?"

The Department of Labor is sending the following message to wage earners throughout the country: "Use your influence with your city fathers, your selectmen and other town officers to start at once municipal and town improvement." Cities and towns are being urged to build school houses, engine houses, roads, canals and other improvements. To those who believe that the cost of building will be less in a few years from now than it is now, the Department of Labor is replying that "probably 95 per cent of the cost of a residence ultimately goes to labor whenever a home is built, so that the cost is almost immaterial to wage earners as a class." Secretary Baker of the War Department is also co-operating in the campaign, and has asked all the Governors of the States, to urge in their inaugural messages the immediate resumption of building of every character.

Recent Happenings in Great Britain

Reform from Within Speedily Carried Out Is the Plan for Settling Problems Fancied and Real

(From Our Regular Correspondent)

At the time of writing, Great Britain and Ireland face a general election (the first that has taken place for eight years). The Coalition party which will doubtless be returned to power has put forward a program of reform and reconstruction ambitious and far-reaching beyond all precedent. It is a British manifestation by way of ordered development of that new heaven and new earth idea which is a product of a great war and which in some other European countries is producing revolution and in some cases anarchy. There is a widespread feeling that if we are to escape revolution, drastic social and economic changes must be speedily brought about through the agency of the existing government institutions. The bulk of promised benefits is apparently to go to the working classes. All other people are called on to labor, not for their own advantage so much as for that of manual workers.

RAILWAY TRANSFORMATION PROMISED

Transportation is among the subjects in regard to which a transformation is promised. In the tremendous program which the leaders of the coalition have put forward, the subject of development of railways, tramways, road automobile transport and canals is given a prominent place. It has at length been borne in on British statesmen—albeit they admit the fact only tacitly—that the development of means of transport in this country has for years been smothered by legislative and municipal action. This is especially true as regards street tramways and interurban light railways. Expert committees appointed by the government have recently reported on the subject in unmistakable terms.

In the manifesto to the electors of the United Kingdom issued by the Coalition leaders, Lloyd George and Bonar Law, the following passage occurs:

HELP THE AGRICULTURIST

"A systematic improvement in the transport facilities of the agricultural areas must form an essential part of every scheme for the development of the resources of the soil, and the governments are preparing plans with a view to increasing these facilities on a large scale."

And again:

"By the development and control in the best interests of state, and the economical production of power and light of the railways and the means of communication . . . output will be increased, new markets opened out and great economies effected in industrial production."

Lloyd George, who, as the highly successful Prime Minister associated with the winning of the war, speaks with authority in this country, was a little

more explicit in an address with which he opened the election campaign. As a collateral subject he spoke of the necessity for the development of a great electric power supply scheme for all purposes, but he insisted on the necessity for improved transportation for the revival of dead rural life and for the development of housing schemes in suburban and rural areas. "You must," he said, "have good services of tramways, light railways, lorries and whatever enables people and goods to pass along great spaces in order to make use of the surface" of the country. "The war has demonstrated that transportation is a service for which the state should accept direct responsibility. . . . Unless this happens, the poorer neighborhoods will always suffer."

From all this it is clear that formidable changes lie ahead. The point on which practical men want information is where there is to be state ownership and operation of public utilities, or where there is simply to be state aid and facilities for development along with a certain amount of state co-ordination and control. For the sake of the country itself as well as for the sake of development of the industries concerned, it is to be hoped that the latter will be the alternative. In any event, it is quite clear that a whole host of obstructions to transportation development are likely to be swept away. The municipal as well as the Parliamentary deadhand should be removed. The latest development at the time of writing is a recommendation by a parliamentary committee in favor of unified ownership and management of chief railways either under the state or under a company.

JEALOUSY CROPS OUT

Fresh opportunities continue for the display of jealousy by the English municipal tramway element of all that concerns companies' interests in the matter of tramways. When months ago the Board of Trade appointed a tramways committee to settle priority of claims for materials and to see that under war scarcity conditions all tramways essential for war work should be operated to the fullest extent, the municipal element complained that it was not sufficiently represented on the committee and that the chairman of it was a company, not a municipal, man. An additional municipal representative was then added to the committee, which consists of tramway managers. Fuel has now been added to the old fire by the appointment of A. H. Pott to be visiting technical officer to the committee at a salary of £750 a year. The municipal grievance is that Mr. Pott has been "a company man," having been engineer and manager to the London United Tramways and the Metro-

politan Electric Tramways. No doubt exists as to his qualifications for the post. Perhaps the municipal jealousy may be mollified by the reflection that as the war has come to an end the necessity for the existence of the tramways (Board of Trade) committee should disappear.

OTHER CHANGES IN PERSONNEL

The appointment of Mr. Pott is one in a series of linked changes which have recently been made in the management of some of the most important tramway systems in England. The great organization associated under the name of the Underground Electric Railways, London, has from time to time attracted to its service some of the most prominent municipal tramway managers in Britain. The latest transfer of the kind, which took place during the autumn, was that of C. J. Spencer, manager of Bradford Corporation Tramways, and honorary secretary of the Municipal Tramways Association. He entered the service of the London group without any public notification of the post which he was to fill. On the appointment of Mr. Pott to the tramways (Board of Trade) committee, referred to above, it was announced that Mr. Spencer was appointed manager of the Metropolitan Electric Tramways and the London United Tramways, both of which undertakings are controlled by the Underground Electric Railways, London. Mr. Spencer's place at Bradford was filled by the appointment of R. H. Wilkinson, tramway manager and engineer to the Huddersfield Corporation, while now it is announced that A. A. Blackburn, chief engineer and assistant to the manager of the Belfast Corporation Tramways, takes the place of Mr. Wilkinson at Huddersfield.

Some importance to tramway and electric railway undertakings attaches to a report by the Advisory Council of the Ministry of Reconstruction on the standardization of railway equipment. Among other things, the Council proposes that the standardization of wheels, axles, wheel centers, tires, running gear, draw gear, buffing gear, bogies, brakes and underframes should be dealt with immediately by the engineering standards committee. That committee has done valuable work for a number of years in bringing about standardization in engineering industrial products.

COMMITTEE ON PRODUCTION A MISNOMER

That official body with the misleading name, the committee on production, issued in the end of November an award on a further demand by British tramway employes for increases of wages to meet the still advancing cost of living. Some of the claims are not allowed, but for adult men and also for women who are doing the work of men pay is increased to 30s. per week above pre-war rates. Thus the financial position of many tramway undertakings becomes more and more difficult.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

Mopping Up

New York Putting the Finishing Touches to Its \$300,000,000 of New Rapid Transit Lines

A review by the Public Service Commission for the First District of New York of the progress made in 1918 of the rapid transit work under the dual system shows that about 75 per cent of the work is finished, and the promise is made that nearly all of the remaining 25 per cent will be ready for the operation of trains before the end of 1919.

CITY ADMINISTRATION MUST HELP

Emphasis is laid on the fact that it will not be possible to keep this promise unless there is cordial and prompt co-operation between the commission and the Board of Estimate of the city of New York not only in relation to the work yet to be contracted for, but as to the work now under way and for which appropriations are needed.

There are 341 track-miles in the entire system, and not more than 35 track-miles, or thereabout, will remain uncompleted twelve months hence. Within a few months after New Year's Day in 1920 trains will be operating over the entire stretch of this rapid transit highway, and plans for the extension of the system will be ready for consideration.

These new plans are known to include:

1. The extension of the Queensboro subway from Times Square, its present Manhattan terminus, west to the Hudson River.

2. A subway in Eighth Avenue extending south to the Battery and north to the northern edge of the Bronx.

3. The extension of the Broadway subway from Fifty-ninth Street, where it will turn east and go to Queens via tunnel at the foot of Sixtieth Street, direct north under Eighth Avenue to the Bronx.

4. A moving platform from Times Square to the Grand Central Station instead of the present shuttle, with exits and entrances at all intersections.

FEW UNAWARDED CONTRACTS

The contracts still to be let for the completion of the dual system provide for the construction of the elevated part of the Fourteenth Street-Eastern line in Williamsburg, the extension of the steel work on Westchester Avenue east of the Bronx River on the Pelham Bay Park line, the extension of the Queensboro subway from Park Avenue to Times Square, and for the Nassau Street subway connecting the

Centre Street loop in the Municipal Building with the Whitehall Street-Montague tunnel to Brooklyn.

These contracts will be ready to let early in 1919 as well as other contracts for track installation, station finish and the odds and ends to make the work complete. Other important work to be done will be the acquisition of real estate for storage yards for the Pelham Bay Park line, the Corona Elevated line and the Livonia Avenue branch of the Eastern Parkway line in Brooklyn. The time of trouble in getting steel to carry on the work is past, the commission believes, and the hope is expressed that from now until the end there will be plenty of men and material and plenty of money, too, if the Board of Estimate will lend a helping hand.

Contracts already made by the commission for the city-owned lines of the dual system aggregate approximately \$208,000,000. The operating companies, exclusive of real estate, have spent about \$102,000,000 for equipping these and company-owned lines.

Arbitrators Will Fix Wreck Costs

Whether the Brooklyn (N. Y.) Rapid Transit Company shall charge to operating expenses the costs growing out of the Malbone Street tunnel accident on Nov. 1 is to be decided by a board of arbitration consisting of Louis Marshall of the law firm of Guggenheimer, Untermeyer & Marshall, who was named by the Public Service Commission, ex-Secretary of War Lindley M. Garrison of the law firm of Hornblower, Garrison, Miller & Potter, who was chosen by the company, and ex-Justice Charles E. Hughes, who was named by Chief Judge Frank H. Hiscock of the Court of Appeals, because the company and the commission could not agree upon the third member.

Under the dual contracts between the company and the city the latter is entitled to a share of the receipts after operating expenses are met. If all the expenses of the accident were charged against operating expenses the result would be that the city would be paying at least half of the costs of the accident. It was also provided in the contract that any disagreement concerning charges should be determined by arbitration.

The commission has notified the members of the Board of Estimate that arbitration proceedings are under way, so that care can be taken to keep any expenditures due to the accident out of the accounts showing the city's interest on investment or its share in receipts.

Labor Reports

Supply and Demand Seem to Be Pretty Well Equalized in Most of the Country

The statement as to labor conditions throughout the country made up from the weekly reports obtained by the Department of Labor by telegraph from local representatives of the United States Employment Service shows that in Portland, Me., the indications are that supply and demand are equal. In Boston, Lynn and Worcester, Mass., there have been slight decreases from firms reporting, caused by the laying off of men. The rest of the State shows supply and demand equal. Reports from Providence indicate a reduction in employees, with supply and demand equal. Connecticut, according to reports received, is the only state in New England that shows any marked surplus.

In New York Buffalo appears to be the only city in the State reporting a large surplus.

In New Jersey a shortage is indicated by most of the cities reporting, with a marked reduction in Newark.

No surpluses are indicated in Pennsylvania. Throughout that State the principal shortages indicated are found among electricians, laborers, machinists, railroad workers and blacksmiths.

Heavy unemployment is indicated in reports from Cleveland and Dayton.

In Illinois supply and demand are now reported to be about equal. Especially is this true of Chicago. Throughout the State there appear to be shortages in labor, railroad workers, and agriculture. Detroit, Mich., reports a large surplus, probably caused by holiday lay-offs and inventory. A small laying-off of men in Minneapolis and St. Paul is reported. Reports from Duluth indicate a slight increase.

Atlanta, Baltimore, Norfolk continue to show shortages. Shortages in Georgia are indicated in carpenters, laborers and textile workers, with a heavy shortage in Maryland of coal miners and laborers. Nashville reports a surplus of 2000. In New Orleans supply and demand are about equal.

Salt Lake City still indicates a surplus, though slight, with a shortage from Little Rock. Kansas City reports a slight lay-off. St. Louis a slightly increased lay-off.

San Francisco indicates a surplus of 7500 as against 7000 in a previous report. The Oakland surplus is still given as 2500. In Los Angeles supply still equals demand. There is a shortage in Seattle, but supply and demand are about equal in Portland, Ore.

Revenue Bill Provisions

Some Provisions of Measure Regarded as Working Further Hardship on Public Utility Companies

The revenue bill has passed the Senate and is now before the conference committees of Congress. Two sections of the bill are of particular importance to public utility companies.

One of these is Section 240. It deals with the consolidated returns of public utility companies, and was amended by the Senate. The Washington representative of the ELECTRIC RAILWAY JOURNAL reports that public utility men who have recently visited Washington from various sections of the country hope that the Senate amendment in respect to consolidated returns will be acquiesced in by the House conferees. These representatives of the utilities express the opinion that the Senate amendment gives an apparent equity and convenience to holding companies whose properties are widely scattered and are operated under varying conditions of public regulation.

BILL UNDULY BURDENSOME

The other section of the bill of interest to public utilities is that embodied in Senate Amendment 488. Public utility men recently in Washington in this instance, however, regard this amendment as imposing an undue burden upon public utility companies for the reason that during the war a great shrinkage occurred in the real value of public utility stocks. As the bill was passed by the Senate, the basis of computing for capital stock tax was made "the net assets shown by the books," instead of "the fair average value of the capital stock for the preceding year." In connection with this measure representatives of the utilities point out that during and since the war, in connection with the great shrinkage in the real value of their stock, dividends have been suspended in order that funds might be made available for the carrying out of the numerous requirements for extensions and betterments of service as demanded by public authorities and by the government's needs in the prosecution of the war.

It is stated, therefore, that the book assets of the companies do not represent an equitable measure of taxable value and that the use of such a basis would constitute a gross injustice to the industry, which has been burdened more than any other during the war because of its inability automatically to increase its rates sufficiently to absorb the enormous advances in the cost of materials, fuel and labor, all of which have been adjusted upwards through agencies of the federal government.

It is regarded as of the utmost importance that the section as changed by Senate Amendment 488 should not be approved by the House conferees and that the former basis of computing the tax from "the fair average

value of the capital stock for the preceding year," should be reinstated.

The language of the two sections of the bill in question is as follows:

CONSOLIDATED RETURNS, SECTION 240

(a) That corporations which are affiliated within the meaning of this section shall, under regulations to be prescribed by the Commissioner with the approval of the Secretary, make a consolidated return of net income and invested capital for the purposes of this title and Title III, and the taxes thereunder shall be computed and determined upon the basis of such return. In any case in which a tax is assessed upon the basis of a consolidated return the total tax shall be computed in the first instance as a unit and shall then be assessed upon the respective affiliated corporations in such proportions as may be agreed upon among them, or in the absence of any such agreement, then the basis of the net income and invested capital property is apportioned to each corporation. In computing the income tax only one specific credit of \$2,000 (as provided in section 311) only one specific exemption of \$3,000; and in computing the excess profits credit (as provided in section 312) only one specific exemption of \$3,000.

(b) For the purpose of this section, two or more corporations engaged in the same or related business shall be deemed to be affiliated.

(c) If one corporation owns directly or controls through closely affiliated interests or by a nominee or nominee substantially all the stock of two or more corporations is owned or controlled by the same interests, or if one such corporation buys from or sells to another product at prices above or below the current market, thus effecting an artificial distribution of profits, or in any way so arranges its financial affairs with another corporation as to assign to it a disproportionate share of net income or invested capital.

(d) A corporation shall not be deemed to be affiliated with a domestic corporation unless a majority of the voting stock is owned or controlled by such domestic corporation or a resident taxpayer or group of resident taxpayers or by such domestic corporation and a resident taxpayer or group of resident taxpayers closely affiliated with the management of said domestic corporation. Where under this subdivision a foreign corporation is affiliated with a domestic corporation, the total tax (computed as a unit as above provided) shall be reduced by the credit authorized in section 238.

TITLE X.—SPECIAL TAXES. SECTION 1000

(a) That on and after July 1, 1918, in lieu of the tax imposed by the first subdivision of section 407 of the Revenue Act of 1916:

(1) Every domestic corporation shall pay annually a special excise tax with respect to carrying on or doing business, equivalent to \$1 for each \$1,000 of the excess over \$5,000 of the amount of its net assets shown by its books as of the close of the preceding annual period used by the corporation for purposes of making its income tax return; but if the corporation made no such return, then of the excess over \$5,000 of the amount of its net assets shown by its books as of the 30th day of June preceding. * * *

War Board Challenged

The National War Labor Board on Dec. 30 began an inquiry into hours and conditions of labor on the Third Avenue Railway, New York.

On behalf of the employees, application was made to the board for a recommendation that employees alleged to have been discharged during the present year for belonging to a union should be reinstated and paid for the interval during which they were without employment. The board was also

asked to rule that the company, which has employed women in recent months, should take back into its employ all men employees who wish to go back into the service. Higher wages and shorter hours were also asked for.

The company was not represented by counsel at the hearing, but a memorandum was submitted on its behalf, denying the authority of the War Labor Board, as follows:

Neither the federal government nor any federal agency has power or authority to regulate, interfere with, or in any way control the operation of a street surface railway located wholly within a state. The decisions of your board relative to labor employed by such a street surface railway must necessarily affect the operating expenses of such railway, and yet the power to increase or regulate the rates of fare of such railway is vested only in the state.

Any federal legislation, act, or proclamation purporting to give to your board power to pass upon, or control in any way, matters relative to labor employed by a street surface railway, or otherwise to regulate the expenditure and operation of a street surface railway, is confiscatory and unconstitutional, in that neither the federal government nor any federal agency has the power to afford to such street railway corporation any necessary increase in rates or revenue to enable it to carry out any decision of the War Labor Board requiring, or which may result in, additional or increased expenditures by such street surface railway.

Improving Short Line

Eighteen-Mile Massachusetts Road Being Completely Equipped for Trolley Operation

Plans for further development of the Grafton & Upton Railroad are under way. The company operates a standard-gauge railroad about 18 miles long, running from Milford, Mass., through Hopedale, Upton, West Upton and New England Village to North Grafton, where it connects with the main line of the Boston & Albany Railroad about 6 miles east of Worcester.

The passenger service on this road has been operated by the Milford & Uxbridge Street Railway for about sixteen years, the street railway cars using the railroad track between centers of towns, with detours into the streets and village centers at each place above named.

The railroad right-of-way is now being completely equipped with overhead trolley construction (in addition to the sections hitherto used by the Milford & Uxbridge cars) and the company has purchased 20 30-ton General Electric locomotives for handling freight over the line at night. One additional electric locomotive may be purchased later if the traffic conditions warrant. Two steam locomotives are owned by the road.

The electric freight service has not yet been started, but the indications are that this will be done during the present winter, or in the early spring at the latest. H. A. Billings, the Draper Company, Hopedale, Mass., is in charge of the operation of the Grafton & Upton line. At North Grafton there is a crossing of the Worcester Consolidated Street Railway. Power is purchased from the Milford & Uxbridge Street Railway.

New York Commissioners Resign

Charles Bulkley Hubbell, chairman, and Samuel H. Ordway, resigned on Dec. 31 as members of the Public Service Commission for the First District of New York. Mr. Hubbell addressed his resignation to Governor Whitman, while Commissioner Ordway wrote to Governor-elect Alfred E. Smith. The term of office for which Chairman Hubbell was appointed would have expired on Feb. 1, 1919, and that of Commissioner Ordway on Jan. 20.

In his letter of resignation Mr. Hubbell recalled Mr. Smith's declarations regarding the reorganization of the Public Service Commission, and said that he wished to resign so as to give the Governor-elect a free hand immediately after he takes office.

Commissioner Ordway explained in his letter to Mr. Smith that he had not sought the office of Public Service Commissioner and had accepted it with reluctance. His appointment was made during a recess of the Senate and has never been confirmed.

News Notes

War Labor Board to Visit Cincinnati.—On Jan. 6 examiners of the War Labor Board will visit Cincinnati to inquire into the scale of wages paid to employees of the Cincinnati Traction Company, other than platform men. The schedule provides for a minimum wage of 42½ cents an hour.

Wage Increase in Youngstown.—The Mahoning & Shenango Railway & Light Company granted the men a substantial increase in wages. A new agreement has also been signed. The men will be advanced from 34 cents to 48 cents an hour. More than 500 men are affected.

New Member Iowa Conciliation Board.—C. F. Harrington, Sioux City, Iowa, banker, has been named to the vacant place on the Iowa Conciliation Board. His selection was agreed upon by the Iowa League of Municipalities and the public utilities organization. Mr. Harrington takes the place of J. H. Ingwerson, who has moved from the State.

Ottumwa Strike Settled.—The strike of employees of the Ottumwa Railway & Light Company, Ottumwa, Iowa, was only of forty-eight hours' duration and was ended by the members of the City Council agreeing to grant the 6-cent fare which was asked by the company in order to increase the wages of the employees. The fare increase is for the period until peace is declared.

I. C. C. Rate Authority to Stand.—Authority of the Interstate Commerce Commission will stand regardless of

federal control of the railroads. In a far-reaching decision, the commission has made clear its authority to act, and also determine the status of all cases now before it as well as the validity of decisions rendered before the government took control of the roads.

Hearing on Women Again Changed.—The hearing involving the employment of women on the lines of the Detroit (Mich.) United Railway set for Chicago on Jan. 4 instead of at Washington has again been changed by the War Labor Board and it is understood that the Chicago date has been cancelled and that the hearing will probably be in Washington at a date yet to be determined.

Receiver Satisfies Pittsburgh Men.—Charles A. Fagan, receiver for the Pittsburgh (Pa.) Railways, on Dec. 18 following a conference with union officials, ordered the reinstatement of a carman discharged for refusing to take out an unheated car, and announced that within five days heaters would be installed in the vestibules of all the cars, as provided for in the agreement between the receivers and the employees.

Toronto Fine Sustained.—The judgment of the Ontario Railway & Municipal Board, imposing a fine of \$24,000 on the Toronto (Ont.) Railway, as a penalty, at the rate of \$1,000 a day, for delay in putting 100 new cars into service, has been confirmed by the Provincial Appellate Court. The company disputed the authority of the Ontario Railway & Municipal Board to impose such a fine. The board was sustained.

Association of Oklahoma Operators.—The Oklahoma Utilities Corporation is the official designation of the union of all public utilities in Oklahoma, including city electric railways, interurban companies, etc. The purpose is to bring into closer touch and co-operation the managers of all such companies and to make for uniform service and regulations throughout the State. Headquarters will be maintained in Oklahoma City.

Labor Department Organizes New Divisions.—Secretary W. B. Wilson of the Labor Department announces the establishment of three new divisions as follows: Division of industrial hygiene and medicine, to develop standards of sanitation and medical practice in industries; division of labor administration, to advise employers as to employment systems and labor management policies; and division of safety engineering, to develop standards and practices for accident prevention.

Wants to Void Occupation Tax.—The Omaha & Council Bluffs Street Railway, Omaha, Neb., has asked the District Court to declare void the occupation tax, under which it pays the city of Omaha between \$75,000 and \$100,000 a year. The petition was filed in connection with a motion to vacate an injunction obtained by the city against the company in which Mayor

Smith sought to have the courts order the company to restore service while the recent strike was in effect.

More Politics.—As a result of the blow aimed at the Public Service Commission for the First District of New York by the Board of Estimate on Dec. 30 almost the entire inspectional force on subway construction had to be cut off. Other employees vital to the pushing of the new subways had to be released. It is probable that the Legislature will be asked to appoint a special committee to investigate the way in which the work of the commission has been hampered.

Up to the Incoming Council.—The City Council of London, Ont., at its final meeting of 1918, rejected a resolution to cancel the franchise, of the London Street Railway and eject it from the streets. It was alleged that the company had refused to comply with the city's time and speed requirements, and that it had defied the Council's order for the collection of a fine of \$10 a day for delay. The outgoing Council, however, indorsed the spirit of the resolution and recommended that action be taken at the first meeting of the Council of 1919.

Council Opposes New Depot Ordinance.—A resolution was adopted on Dec. 23 by the City Council of Cleveland, Ohio, opposing the proposed union depot ordinance, initiated by the officers of the Cleveland Union Terminals Company, to be voted upon at an election on Jan. 6. The resolution is intended as a recommendation to voters to defeat the ordinance, in the belief that the company will then propose another grant that will be more satisfactory to the Council and the engineers and organizations which have criticised the proposal.

Co-operative Store Idea Abandoned.—Groceries and canned goods of the New York (N. Y.) Railways valued at \$150,000, are being offered at auction. The sale marks the last step in the dissolution of the chain of co-operative stores which the Interborough and the New York Railways Company established to lower the cost of living for their employees. The stores were given up by the companies for lack of patronage on the part of the employees, for whose exclusive use they were opened several years ago. The salaries of grocery clerks and butchers and the upkeep of the stores were paid by the companies so that the goods could be sold strictly at cost without figuring in overhead expenses.

Program of Meeting

Illinois Electric Railway Association

The annual meeting of the Illinois Electric Railway Association will be held in Chicago on Jan. 17. It is expected that P. H. Gadsden, chairman of the committee on readjustment of the American Electric Railway Association, will address the association.

Financial and Corporate

New Angles at Columbus

Stockholders' Protective Committee
Confers with Management About
Settlement of Problems

The stockholders' protective committee of the Columbus Railway, Power & Light Company, Columbus, Ohio, conferred with Norman McD. Crawford, vice-president, on Dec. 27 relative to certain demands which have been made by the members. Chairman Emil Keiswetter afterward stated that conferences so far held had not resulted in much progress. It is said that the committee will insist that the control and responsibility of operation be localized. The committee asks to be represented at the annual meeting on Jan. 28 by three out of the five members of the proxy committee.

Clarence M. Clark, vice-president of the company, conferred with the committee on Dec. 23 and 24. At that time both Mr. Clark and the committee felt that progress had been made toward an understanding. Mr. Clark expressed the belief, however, that the organization of a stockholders' protective committee was ill-advised.

CONCLUSIONS OF REPORT CRITICIZED

Both Mr. Clark and Mr. Crawford criticized the conclusions and estimates that E. W. Bemis has drawn from the figures presented in his report. No one, they said, could make an estimate of what the results would have been during September and October, 1918, had the old rate of fare been used. The figures given in the report, they say, bear out the company's claim as to losing money. Mr. Crawford said that, on June 30, before the change in fare had been made, the railway department had \$241,584 with which to meet interest charges and depreciation on its proportion of the company's investment, after paying all operating expenses and taxes. The interest charges alone would have been about \$210,000, he said, leaving \$31,000 to meet depreciation charges of about \$333,000. The railway department, therefore, fell short more than \$300,000 in six months.

On Dec. 24, an owner of ten shares of stock filed a petition in Common Pleas Court in which the appointment of a receiver was asked. The petition alleged that the repudiation of the old rate of fare of eight tickets for a quarter had damaged the company's securities.

SUIT NOT SERIOUS

H. W. Clapp, general manager of the company, said on Dec. 30 that this suit was brought by an attorney, representing a number of small stockholders, in order to fix their status in the matter. It did not represent an action by minority stockholders, and there was nothing serious about it. The court, he said, is not likely to take any action on it soon, if at all.

On the same day C. M. Clark, representing the Clark Management Company, and the stockholders' protective committee held another conference.

B. R. T. in Receiver's Hands

Lindley M. Garrison Called Upon by
Court to Administer Affairs of
Sorely Beset Railway

Judge Julius M. Mayer of the United States District Court at New York, after the close of business on Dec. 31, made an order appointing Ex-Secretary of War Lindley M. Garrison temporary receiver of the Brooklyn Rapid Transit Railroad Company, the New York Municipal Railroad Corporation, and the New York Consolidated Railroad Corporation, these two being subsidiaries of the Brooklyn Rapid Transit Company. The order was made upon the application of the Westinghouse Electric & Manufacturing Company, a creditor, for material furnished. The companies did not oppose the action, for they felt that they would be subserved by a temporary receivership.

MANY MILLIONS NEEDED

The immediate requirements were for meeting on Jan. 1 obligations for about \$2,000,000, and this could have been obtained, but to complete the construction and equipment work now under contract and to provide for additional expenditures for similar purposes during the coming year will require the raising of many millions more, and the general situation affecting street railroads, with their stationery fares and rising costs, had injured their credit and made impossible up to the present time provision for the investment of fresh capital.

Col. Timothy S. Williams, president of the Brooklyn Rapid Transit Company, made a statement in which he said in part:

"Every possible effort to provide for these construction and equipment needs, including informal applications to the War Finance Corporation, had been taken by the directors, but without substantial results, and it seems wise to face the issue now with the hope that general knowledge and appreciation of the necessities would suggest a way for their solution.

COMPANY HANDICAPPED BY CITY

"The company has been greatly handicapped by the delay of the city in completing its subways. These should have been mostly in operation two years ago.

"The essential parts of them are still under construction. In the meantime a large part of our \$60,000,000 investment is unproductive, and existing and completed parts of the system cannot be effectively or profitably operated.

"In addition to this handicap the high cost of labor and materials and the other hardships, caused by the war,

have largely reduced the net earnings. The effort on the part of the company to restore rates of fare authorized by their franchisees or to get the right to charge fares sufficient to meet the cost of service, has thus far failed.

"It is greatly to the advantage of the property that the court has appointed as receiver a man of executive and of administrative ability, ex-Secretary of War Garrison."

Mr. Garrison, the receiver, was in Washington on Jan. 1 but he denied his visit was for the purpose of seeking further government aid.

W. F. C. ADVANCED \$17,320,500

On June 20 last the directors of the War Finance Corporation decided, upon certain conditions, to make a direct advance of not exceeding \$17,320,500 to the Brooklyn Rapid Transit Company for the purpose of enabling the company in part to meet the \$57,735,000 face amount of its six-year 5 per cent secured gold notes, maturing on July 1, 1918. For this advance the War Finance Corporation was to receive new three-year 7 per cent secured gold notes of the Brooklyn Rapid Transit Company at par. The War Finance Corporation at that time was willing, on the consummation of the plan then presented for the extension of the maturing notes of the Brooklyn Rapid Transit Company, to make advances in proper cases to banks, bankers, and trust companies, as provided in Section 7 of the War Finance Corporation act, upon the new three-year 7 per cent secured gold notes of the company.

WANTS CITY REPRESENTATION

Corporation Counsel William P. Burr after reading certain comments on the matter said the situation was too complicated for observations that were only intended to be smart. It was Mr. Burr's judgment that it would be to the advantage of all concerned that the city have representation in the management of the affairs of the company by the appointment of a co-receiver to be named by the city and appointed by the court.

The security holders were quick to organize. A committee headed by Albert H. Wiggin is calling for deposit of stock. The Central Union Trust Company, Kuhn, Loeb & Company and Kidder, Peabody & Company are asking for the deposit of the three-year 7 per cent secured gold notes and the six-year 5 per cent secured gold notes of the Brooklyn Rapid Transit Company and the first mortgage 5 per cent sinking fund gold bonds, series A, due on Jan. 1, 1966, of the New York Municipal Railway Corporation.

Fare Increases Show Results

Forty-Three Per Cent of Companies Reporting for September Have Raised Their Rates

The tables just made public by the information bureau of the American Electric Railway Association show the revenues and expenses of electric railways operating over 5000 miles in the United States, for the nine months ending Sept. 30, 1918, as compared with the nine months ending Sept. 30, 1917, and for the month of September, 1918, as compared to September, 1917.

The latter table is particularly interesting as reflecting in some measure the effect of fare increases granted throughout the country. Of the roads, whose statistics are included in this table, nearly 43 per cent have increased their fares since September, 1917. The result is shown in the lowest percentage decrease in net earnings recorded

since August, 1917. Fifty-one per cent of the roads reporting in the Eastern District have received increases, and 33 per cent, in both the Southern and Western Districts.

The result is reflected in the figures, the Eastern district showing an actual percentage gain in net earnings, as against a loss in both of the other districts. That the situation is by no means taken care of by the increases already granted, however, is indicated from the operating ratio for the month which is 68.08 per cent for 1918, as against 64 per cent for 1917.

The operating ratio as shown in the table covering nine months operation, is also discouraging, being 67.20 for 1918 as against 63.32 for 1917, an in-

crease of nearly 4 per cent. The operating ratio for the first nine months of 1916 was 60.96 per cent, so that in two years there has been an actual increase of nearly 7 per cent.

A drop in net earnings of 4.26 per cent for the nine months period is shown, with the Western companies showing the largest loss, 8.10 per cent; the Eastern companies 3.16 per cent and the Southern companies 2.59 per cent. The Western showing is further aggravated by the fact that a strike lasting during the first six months of 1917 took place on one of the largest Western properties, and kept earnings down and expenses up during that period.

That there is nearly twice the percentage increase in operating expenses as compared to operating revenues is the outstanding fact of the table for the nine-month period. This holds true in all districts and both with com-

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS SEPTEMBER, 1918 AND 1917

Account	United States			Eastern District			Southern District			Western District						
	Per Mile of Line			Per Mile of Line			Per Mile of Line			Per Mile of Line						
	Amount, September 1918	1918	% Increase Over 1917	Amount, September 1918	1918	% Increase Over 1917	Amount, September 1918	1918	% Increase Over 1917	Amount, September 1918	1918	% Increase Over 1917				
Operating revenues.....	\$11,786,768	\$2,234	\$2,003	11.53	\$7,944,601	\$2,298	\$2,038	12.76	\$1,238,860	\$1,760	\$1,623	8.81	\$2,603,307	\$2,332	\$2,117	10.16
Operating expenses.....	8,024,487	1,521	1,282	18.64	5,382,908	1,557	1,318	18.13	819,929	1,169	934	25.16	1,821,650	1,632	1,376	18.60
Net earnings.....	3,762,281	713	721	11.21	2,561,698	741	720	2.92	418,951	597	689	15.95	781,657	700	741	15.53
Operating ratio, per cent.....	1918, 68.08; 1917, 64.00			1918, 67.75; 1917, 64.67			1918, 66.19; 1917, 57.55			1918, 69.98; 1917, 65.00						
Av. No. miles of line.....	1918, 5,275; 1917, 5,192			1918, 3,458; 1917, 3,446			1918, 701; 1917, 648			1918, 1,116; 1917, 1,098						

COMPANIES REPORTING TAXES

Operating revenues.....	\$7,726,352	\$2,204	\$1,964	12.22	\$4,673,233	\$2,102	\$1,868	12.53	\$481,799	\$2,185	\$1,828	19.53	\$2,571,332	\$2,42	\$2,196	10.29
Operating expenses.....	5,467,565	1,560	1,318	18.37	3,360,161	1,512	1,299	16.40	311,684	1,414	1,011	39.86	1,795,720	1,692	1,424	18.82
Net earnings.....	2,258,792	644	646	10.37	1,313,071	590	569	3.69	170,109	771	817	15.63	775,612	736	772	15.44
Taxes.....	431,345	123	124	10.87	244,093	110	113	12.65	38,286	174	154	12.99	148,363	140	140	
Operating income.....	1,827,447	521	522	10.19	1,068,978	480	456	5.26	131,823	597	663	19.95	627,649	590	632	16.65
Operating ratio, per cent.....	1918, 70.78; 1917, 67.11			1918, 71.93; 1917, 69.54			1918, 64.71; 1917, 55.31			1918, 69.86; 1917, 64.85						
Av. No. miles of line.....	1918, 3,505; 1917, 3,473			1918, 2,223; 1917, 2,212			1918, 212; 1917, 217			1918, 1,061; 1917, 1,044						

†Indicates decrease.

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR NINE MONTHS, JANUARY-SEPTEMBER, 1918 AND 1917

Account	United States			Eastern District			Southern District			Western District						
	Per Mile of Line			Per Mile of Line			Per Mile of Line			Per Mile of Line						
	Amount, January-September, 1918	1918	% Increase Over 1917	Amount, January-September, 1918	1918	% Increase Over 1917	Amount, January-September, 1918	1918	% Increase Over 1917	Amount, January-September, 1918	1918	% Increase Over 1917				
Operating revenues.....	\$97,697,830	\$18,844	\$17,600	7.07	\$65,816,918	\$19,547	\$18,291	6.87	\$10,018,751	\$14,286	\$13,153	8.61	\$21,862,161	\$19,586	\$18,113	8.13
Operating expenses.....	65,657,286	12,664	11,145	13.63	43,893,296	13,056	11,572	12.65	6,226,296	8,878	7,601	16.80	15,537,694	13,920	11,930	16.68
Net earnings.....	32,040,544	6,180	6,455	14.86	21,923,622	6,511	6,719	19.10	3,792,455	5,408	5,552	12.69	6,324,467	5,666	6,183	18.36
Operating ratio, per cent.....	1918, 67.20; 1917, 63.32			1918, 66.69; 1917, 63.27			1918, 62.14; 1917, 57.79			1918, 71.07; 1917, 65.86						
Av. No. miles of line.....	1918, 5,184; 1917, 5,101			1918, 3,367; 1917, 3,355			1918, 701; 1917, 648			1918, 1,116; 1917, 1,098						

COMPANIES REPORTING TAXES

Operating revenues.....	\$63,374,872	\$18,560	\$17,264	7.51	\$38,025,382	\$17,831	\$16,761	6.38	\$3,745,507	\$16,986	\$14,742	15.22	\$21,603,983	\$20,352	\$18,810	8.20
Operating expenses.....	45,556,188	13,342	11,613	14.89	27,962,833	13,112	11,598	13.05	2,286,466	10,369	8,169	26.93	15,306,889	14,420	12,357	16.69
Net earnings.....	17,818,684	5,218	5,651	17.66	10,062,549	4,719	5,163	18.60	1,459,041	6,617	6,573	0.67	6,297,094	5,932	6,453	18.07
Taxes.....	4,447,243	1,302	1,181	10.25	2,626,056	1,231	1,148	7.23	308,880	1,401	1,318	6.30	1,512,307	1,425	1,220	16.80
Operating income.....	13,371,441	3,916	4,470	12.89	7,436,493	3,488	4,015	13.83	1,150,161	5,216	5,255	10.74	4,784,787	4,507	5,233	13.87
Operating ratio, per cent.....	1918, 71.89; 1917, 67.27			1918, 73.53; 1917, 69.20			1918, 61.04; 1917, 55.41			1918, 70.85; 1917, 65.69						
Av. No. miles of line.....	1918, 3,415; 1917, 3,383			1918, 2,133; 1917, 2,122			1918, 220; 1917, 217			1918, 1,062; 1917, 1,044						

†Indicates decrease.

panies reporting taxes and those which do not. It is modified somewhat in the September tables, where fare increases have evidently helped out the revenues of the companies.

The returns from the city and interurban electric railway companies, as shown in detail in the tables on page 69.

\$116,785,500 in Maturities

Nearly Half Grand Total of \$261,887,600 Utility Maturities in 1919 Fall to Electric Railways

Public utility securities maturing during 1919 aggregate \$261,887,600, compared with \$210,500,000 in 1918, according to the *Wall Street Journal*. Owing to conditions arising from the war public utility companies found it difficult during the last three years to sell long-term bonds at normal rates of interest, so that the short-term method was employed in many cases to tide over the tight money market. Since the armistice was signed, however, market conditions have improved considerably. Therefore, in the coming year, according to the *Journal*, there should be a gradual shift from the practice of short-term financing to the long-term bond method. Below is given in detail, as compiled by Dow, Jones & Company, the various electric railway issues of more than \$200,000 maturing in 1919, in order of their due dates.

January	
East St. Louis & Sub. Co. conv.	\$2,094,000
Intorboro Cons. bank loan	700,000
Chattanooga Elec. Ry. Ist.	625,000
Pensacola Elec. 3-yr. notes	500,000
Knoxville Ry. & Lt. 2-yr. notes	400,000
Seashore Elec. Ry. Ist. ext.	200,000
General Gas & Elec. notes	200,000
Winnipeg Elec. 2-yr. notes	200,000
Twin State Gas & El. 1-yr. nts.	300,000
Total	\$5,769,000
February	
American Ry. Co. 3-yr. notes	1,672,000
Eighth Ave. R.R. etc. of debt	750,000
Connecticut Co. prov'd. deb.	250,000
Zanesville Electric Ry. Ist.	250,000
Washington Water Pow. notes	2,600,000
Total	\$5,522,000
March	
Public Serv. of N. J. 3-yr. notes	\$7,500,000
Union Ry. Gas & El. 3-yr. notes	3,000,000
Fort Wayne & N. Ind. tr. notes	1,164,000
Jacksonville Trac'n & N. notes	750,000
Am. Public Service cv. notes	500,000
Total	\$12,914,000
April	
Montreal Tram & P. 2-yr. notes	\$5,350,000
Union Ry. Gas & El. 2-yr. notes	7,000,000
Denver Tramway 3-yr. cv.	2,500,000
Denver City Tramway Ist.	2,000,000
Birmingham Ry. Lt. & P. notes	1,312,000
Total	\$14,162,000
May	
West Va. Trac. & El. 2-yr. notes	1,800,000
United Traction Co. deb.	456,000
WaterViet Turpike & R.R. Ist.	350,000
Marion City Ry. Ist. ext.	328,000
Madison Ry. 3-yr. notes	200,000
Total	\$3,134,000
June	
Michigan Ry. 5-yr. notes	\$6,500,000
N. Orleans Ry. & Lt. 1-yr. notes	4,000,000
Grand Rapids Ry. Ist. ext.	3,500,000
Elgin, Aurora & So. Tr. Ist. ext.	2,000,000
Ind., Newcastle & East Tr. Ist.	1,200,000
N. Orleans Ry. & Lt. 1-yr.	1,000,000
Miscellaneous	544,500
Total	\$18,744,500

have been classified according to the following geographical grouping: Eastern District—East of the Mississippi River and north of the Ohio River. Southern District—South of the Ohio River and east of the Mississippi River. Western District—West of the Mississippi River.

July	
Chicago Elev. Rys. notes ext.	\$13,601,000
American Cities Co. coll. tr.	7,500,000
Piedmont & No. Ry. 2-yr. notes	6,286,000
Union Traction of Indiana gen.	4,611,000
Northern Ohio Traction cons.	2,995,000
Stoa City Traction Ist. Ry.	750,000
Cin., Lawrenceburg & A. St. Ry.	750,000
Arkans. Valley Ry. L. & P. nts.	450,000
Chi., No. Shore & Mil. notes	345,000
Total	\$37,288,000

August	
Reading Trans. & Lt. 2-yr. nts.	\$2,450,000
West End Street Ry. deb.	1,581,000
St. Louis Ry. 2-yr. notes	1,000,000
Riverside & Arlington Ry. Ist.	200,000
Iowa Ry. & Light 2-yr. notes	700,000
Total	\$5,266,000

September	
Am. Pub. Utilities Co. notes	489,000
Ohio Traction Co. notes	350,000
Total	\$839,000

October	
Toronto & York Radial Ry. Ist.	\$1,640,000
Milford, Attleboro & W. St. Ry.	300,000
Total	\$1,940,000

November	
Brazilian Tr. Lt. & Pr. 3-yr. nts.	\$7,500,000
Memphis St. Ry. 2-yr. notes	1,250,000
Total	\$8,750,000

December	
Boston Suburban Elec. notes	\$1,100,000
Kans. City Rys. 2-yr. nts. & A.	1,000,000
Bay State Street Ry. notes	357,000
Total	\$2,457,000
Bonds and notes maturing in January	\$5,769,000
Bonds and notes maturing in February	5,522,000
Bonds and notes maturing in March	12,914,000
Bonds and notes maturing in April	14,162,000
Bonds and notes maturing in May	3,154,000
Bonds and notes maturing in June	18,744,500
Bonds and notes maturing in July	37,288,000
Bonds and notes maturing in August	5,266,000
Bonds and notes maturing in September	839,000
Bonds and notes maturing in October	1,940,000
Bonds and notes maturing in November	8,750,000
Bonds and notes maturing in December	2,457,000

Total electric railway maturities	\$116,785,500		
Grand total all public utility issues	\$261,887,600		
The following electric railway bonds, due in 1919, have been called for payment prior to their due date:			
Issue:	Due 19	Called	Amount
Pug Sd Trac. Lt. & P. nts.	Feb. 1 Aug. 1, '18		\$10,067,000
Monon. Val. Trac. nts. 6s.	Feb. 1 Oct. 1, '18		2,829,000
W. Penn. Pw. 2-yr. nts. 6s.	Aug. 1 Jan. 7, '19		2,000,000
Total called bonds			\$14,896,000
The following electric railway bonds, due in 1919, have been extended to a later maturity:			
Due '19 Extended to	Amount		
Min. St. Ry. Ist. Ss.	Jan. 15 Jan. 15, '22		\$5,000,000

Plan to Reclaim Road

The committee of residents and property owners from Ocean City, N. J., and near-by places appointed to take steps toward purchasing the Ocean City Electric Railroad by popular subscriptions has decided to start at once to acquire the road.

Frank H. Stewart, J. Frederick Martin and Harry Headley, Ocean City,

have been appointed a committee to consult with J. Pithian Tatem, solicitor for the railway, and the Henry D. Moore Corporation, the largest stockholders. The committee, headed by William E. Massey, president of the Ocean City Title & Trust Company, plans to convert the road into a figure eight shape, permitting the cars to traverse some of the main business streets of Ocean City, with continuous service thereon, and with limited, but sufficient service for South Ocean City.

Some time ago the bondholders' committee of the company notified the City Commissioners that it was planned to "junk" the road, because of its inability to meet running expenses. An offer was made to sell the road to the city for \$84,000. Mayor Champion then called a meeting of the citizens to consider the matter.

Wants Its Rental

Cornelius S. Sweetland, secretary-treasurer of the United Traction & Electric Company, Providence, R. I., on Dec. 26 notified the officers of the Rhode Island Company, that unless payment of rental of leased lines, due on Dec. 24, was made on or before Jan. 26 the United Traction & Electric Company would take over and operate the Rhode Island Company's properties under provisions embodied in the lease. Similar action was taken last September when payment was due. The rental due on Dec. 24 amounts to \$149,500.

The notice was served on the federal trustees, who hold the stock of the Rhode Island Company. The trustees two days before had decided to defer the payment of the rental indefinitely, because of the decision of the War Labor Board, which instructed the Rhode Island Company to pay \$72,066 to its employees, on or before Dec. 24. This sum represents one-third of the total of back wages due the employees under a previous award of the War Labor Board.

Twice during the past year the wages of employees have been increased, once voluntarily on the part of the company in May and again in October following an award of the War Labor Board. Fares have also been increased twice, but the burden of higher operating costs has not offset the advance in fares.

The Rhode Island Company is controlled by the New York, New Haven & Hartford Railroad through ownership of the entire capital stock. By the dissolution agreement made with the government in 1914, the New York, New Haven & Hartford Railroad transferred to five trustees, 96,855 shares, constituting the entire capital stock of the Rhode Island Company. The trustees were chosen for a term of five years. The electric railway system comprises 353 miles of electric railway and 8.41 miles of steam railroad, of which 39.92 miles are owned and 321.63 miles are leased, serving the cities of Providence, Pawtucket, Central Falls and all the rest of Rhode Island.

Capital Issues Suspends

Committee May Resume Its Functions If Necessary—Legislation to Check Worthless Securities

The Capital Issues Committee, a specially created arm of the Treasury Department for the control of the issue of new securities during the war, announced that it would suspend its activities on Dec. 31. Chairman Hamlin of the committee warns the public and directs the attention of Congress to the menace to holders of government bonds through the uncontrolled issue of fraudulent and worthless securities. Secretary Glass, in an accompanying statement, says that he will ask for legislation to check the traffic in worthless securities.

2000 APPLICATIONS EXAMINED

From May 17, the date of its organization, to Oct. 21 the committee examined more than 2000 applications. The proposed security issues totaled more than \$3,000,000,000. About 20 per cent of these applications were disapproved. These were mostly of a character involving new extensions, which would not be contributory to the winning of the war.

The committee will not be dissolved but will remain inactive, unless it is found that the sale of new securities competes unduly with government financing or for other reasons it may become desirable for the committee to resume its work, pending its dissolution by the President or by operation of law.

It is the intention of the Capital Issues Committee to make a supplemental report to Congress recommending a law to prevent impositions upon the investing public.

Secretary Glass made this comment on the action taken:

"The decision of the Capital Issues Committee to suspend its activities should not be interpreted by the business public as a warrant for any expenditure of capital for needless or unwise purposes, whether public or private in their nature. Should it become apparent that voluntary restraints are not being exercised so as to prevent the misuse of capital, I shall request the committee to resume its control.

INVESTOR SHOULD BE PROTECTED

"My chief misgiving in accepting the action of the committee arises out of the need the committee has frequently expressed, and the importance of which has become increasingly obvious, of protecting the public investor against the flood of worthless or doubtful securities which threaten the market when the restrictions are removed, and present conditions emphasize the importance of obtaining emergency legislation as speedily as possible, so as to be able to cope effectively with this evil. The government not only should protect itself as to future bond issues, but, as well, owes a duty to the millions of Liberty bond buyers to restrain

reckless and fraudulent promoters, particularly at this time.

"I intend to ask Congress immediately for legislation that will check the traffic in worthless securities while imposing no undue restrictions upon the financing of legitimate business, and shall urge that it be made effective before the close of the present session. Meantime, it may become necessary before such legislation is passed to reassemble the committee for the purpose of resuming its functions."

WORK OF COMMITTEE REVIEWED

In the period between May 17 and Dec. 7 the Capital Issues Committee had 2855 applications submitted to it for a total of \$3,172,912,000. Of this amount \$441,733,000 was for construction and equipment, \$148,156,000 for working capital, \$694,402,000 for refunding and \$1,290,055,000 for purposes of exchange. The total passed was \$2,574,346,000 and the total disapproved \$598,566,000.

There were 308 applications from public utilities. The total applied for from this source was \$755,656,000. Of this amount \$167,215,000 was for construction and equipment, \$6,429,000 for working capital, \$255,648,000 classified by refunding and \$302,427,000 for purposes of exchange, etc. The total of public utility issues passed was \$731,719,000 while the total disapproved was \$21,937,000.

Brockton & Plymouth Road to Continue

Under Chap. 288, Acts of 1918, Massachusetts Legislature, the towns of Hanson, Pembroke and Plymouth have voted to extend financial aid to the Brockton & Plymouth Street Railway rather than to have the property suspend operation through inadequate revenue. Stone & Webster, managers of the road, have announced that the service will be continued.

Under the new agreement the present board of directors will resign with the exception of one representative of the company who will remain on the board. The other directors will be chosen from the various towns served. It is planned to increase the present 6-cent fare unit to 10 cents. If the revenue is then inadequate, the deficiency is to be made up from local tax levies. It is expected that the town of Kingston, adjoining Plymouth, will shortly enter into an agreement with the company along the lines above indicated.

A six months' agreement has been accepted by the town of Plymouth, but the other towns have signed an agreement covering one year's operation.

The Brockton & Plymouth Street Railway operates 24 miles of standard gage electric railway connecting Plymouth, Kingston, Pembroke, Hanson, Whitman and Brockton. It has twenty-eight motor cars and eight other cars and sells energy for lighting and power purposes.

Evansville Reorganization

New Company Incorporated and Plans Being Worked Out for Reorganization After Foreclosure

The Evansville & Ohio Valley Railroad, Evansville, Ind., has filed articles of incorporation with the Secretary of State of Indiana, presumably as the successor of the Evansville (Ind.) Railways, operating the Evansville & Eastern Electric Railway, the Evansville, Henderson & Owensboro Railway and the Evansville & Mount Vernon Railway. The new company is capitalized at \$1,500,000. The directors are Marcus S. Sonntag, William H. McCurdy, C. Howard Battin, Albert F. Karges, William A. Koch, William A. Carson, and Chris M. Kanzler, Evansville, Ind.; Wesley Wilson, Newburgh, Ind.; Danby E. Cadick, Grandview, Ind., and Charles E. Tennis, Pittsburgh, Iowa.

PROTECTIVE AGREEMENT DRAWN

A protective agreement for the holders of the first mortgage 5 per cent gold bonds of the Evansville & Eastern Electric Railway, Evansville & Mount Vernon Electric Railway and the Evansville Terminal Railway was drawn some time ago. On the protective committee are Messrs. Walker, Karges, McCurdy, Sonntag, Jewett, McKee, Gwin, Rhodes and Batlin. In a circular to the depositing bondholders dated Sept. 19 they gave notice of the adoption of a plan of reorganization, to be put into effect in the event of the purchase of the properties by them.

Under this plan the successor company will have \$1,000,000 of common stock exchangeable for common stock of the Evansville Railways, \$500,000 of 6 per cent non-cumulative preferred stock exchangeable for preferred stock of the Evansville Railways, \$200,000 of first mortgage 6 per cent thirty-year bonds issuable for rehabilitation, \$1,200,000 of first and refunding 5 per cent thirty-year bonds, \$750,000 of thirty-year income bonds limited to a 5 per cent return, and \$300,000 of ten-year collateral trust 6 per cent notes.

NEW MORTGAGE PROPOSED

The new bonds will be secured by a mortgage covering all of the properties of the Evansville & Eastern Electric Railway, the Evansville & Mount Vernon Electric Railway and the Evansville Terminal Railway, together with the Evansville, Henderson & Owensboro Railway, subject, however, in the case of this property to \$203,600 of preferred stock and to a mortgage securing bonds which are to be issued as collateral for the ten-year notes. The present outstanding bonds and notes of the various companies will be exchanged on the basis of 50 per cent in first and refunding 5's and 50 per cent in general mortgage incomes for the existing issues.

The Evansville (Ind.) Railways went into the hands of W. A. Carson, vice-president, as receiver early in November.

Financial News Notes

Ironwood & Bessemer Bonds Offered.—Halsey, Stuart & Company, New York, N. Y., and Chicago, Ill., are offering \$200,000 of first mortgage 5 per cent bonds of the Ironwood & Bessemer Railway & Light Company, Ironwood, Mich. The bonds are dated Feb. 11, 1911, and are due on Feb. 1, 1936. They are being offered at 87 and interest, to yield 6½ per cent.

Cleveland Interest Fund Again at Minimum.—The November receipts of the Cleveland (Ohio) Railway enabled it to credit \$91,804 to the interest fund, which again brought it above the minimum of \$300,000. There was a deficit of \$80,270 in the fund, created before the maximum rate of fare specified in the Taylor ordinance was increased. The total receipts for the month were \$1,140,593.

Springfield Issues Approved.—The Springfield (Ill.) Consolidated Railway has been authorized to issue capital stock to the amount of \$79,500 by the Illinois Public Utilities Commission. The company was also authorized in the same order to issue \$107,000 of 5 per cent gold bonds maturing in thirty-five years and secured by a mortgage to the Fidelity & Columbia Trust Company and L. N. Bender, trustee, Louisville, Ky., under date of June 1, 1913.

Files Mortgage for Record.—The Fort Smith Light & Traction Company, Fort Smith, Ark., has filed for record a mortgage to secure \$1,000,000 of 5 per cent bonds dated Sept. 3, 1918, and due in 1921. The Continental Trust & Savings Company, Chicago, Ill., is made trustee. The new mortgage is subject to a mortgage of \$6,000,000, made in 1911.

City Would Intervene in Receivership.—Corporation Counsel Byers of Des Moines, Iowa, acting for the city, has filed a petition of intervention in the Federal Court at Des Moines, alleging that the North American Construction Company, complainant in the action which threw the Des Moines City Railway into the hands of the receiver, is controlled by the same interests that own the railway. He asks that the court dismiss the receivership on the ground that the action was brought not to settle a controversy, but solely to force the railway into bankruptcy.

Seven Per Cents Replace Sixes.—The East St. Louis & Suburban Company, East St. Louis, Ill., has advised holders of its five-year 6 per cent bonds due on Jan. 1, 1919, that it proposes to create a new issue of 7 per cent two-year convertible bonds, maturing on Jan. 1, 1921 to take care of the maturing bonds. Interest on the old convertible 6's was paid as usual on Jan. 1. The new bonds will be offered at 99 per cent in exchange for present issue, with 1 per cent discount, payable in cash. Bondholders are asked to deposit their holdings with the Pennsylvania Company for Insurance on Lives & Granting Annuities, Philadelphia.

Plans for Saving Small Ohio Line.—A. T. Van Diense, general manager of the Columbus, Delaware & Marion Electric Company, Columbus, Ohio, has made a proposition to the residents of Richwood and Magnetic Springs to finance the Columbus, Magnetic Springs & Northern Railway, which has not been in operation for some time. This road connects Delaware and Richwood. It is due to be sold some time in January. People of the towns through which the road passes and along the line are endeavoring to raise funds to meet the offer made by Mr. Van Diense, who also proposes to furnish electric light and power service to Richwood.

Employees' Wages 56 Per Cent. of Gross.—In speaking of the volume of

business of the Dallas (Tex.) Railway, Richard Meriwether, general manager, said the company now is maintaining an organization of more than 800 employees, consisting of 500 motormen and conductors, 100 mechanical and electrical men and 180 track workers. In the executive and accounting departments, about sixty persons are employed. Mr. Meriwether said: "At present we are paying in salaries to employees \$90,000 a month. The gross income of the company normally is about \$160,000 a month, and \$90,000 of this is returned in the way of wages and salaries to employees. During the middle of the day in normal times the company operates an average of 104 cars in regular service and during the rush hours it operates 190 cars."

New Cities Service Debentures.—The directors of the Cities Service Company, New York, N. Y., on Dec. 30 announced that the company would offer at par and interest \$10,000,000 new series C 7 per cent debentures to stockholders of record of Dec. 31, 1918, the subscriptions from stockholders closing on Jan. 25. The offering of new debentures has been underwritten by a syndicate of bankers. In case any of the \$10,000,000 should remain unsubscribed for by the stockholders the unsubscribed portion is to be offered to the public by the banking syndicate. The new series C debentures were created in the following manner: The stockholders authorized an issue of \$30,000,000 of 7 per cent debentures, series B. Of these \$12,500,000 were classed as series B, and then the issue was closed. In place of the \$17,500,000 authorized as series B, the directors on Dec. 30 authorized an issue of \$17,500,000 series C debentures, of which \$10,000,000 are now being offered. The series C debentures are convertible on and after Jan. 1, 1921, into nine shares of Cities Service preferred stock and one share of common, together with the accumulated cash and stock dividends on one share of common stock to the date of conversion.

Electric Railway Monthly Earnings

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Oct., '18	\$173,235	\$169,133	\$4,102	\$37,909	\$33,807
1m., Oct., '17	181,128	135,239	45,889	35,619	10,270
10m., Oct., '18	1,775,304	*1,530,066	245,238	361,838	116,600
10m., Oct., '17	1,819,988	*1,301,182	518,806	357,279	161,527
BATON ROUGE (LA) ELECTRIC COMPANY					
1m., Oct., '18	\$21,564	*\$13,398	\$8,166	\$3,939	\$4,227
1m., Oct., '17	19,338	*10,119	9,219	3,616	5,603
12m., Oct., '18	256,810	*136,038	120,772	75,067	45,705
12m., Oct., '17	228,746	*114,337	114,409	42,591	71,818

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

1m., Oct., '18	\$6,247	*\$9,295	\$33,048	\$1,434	\$4,842
1m., Oct., '17	9,509	*10,226	7,717	1,286	12,003
12m., Oct., '18	106,281	*118,601	112,200	16,571	728,891
12m., Oct., '17	124,190	*123,838	352	14,386	114,034

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO

1m., Oct., '18	\$43,562	*\$32,277	\$11,085	\$16,193	\$5,892
1m., Oct., '17	44,939	*\$2,230	12,689	11,692	917
10m., Oct., '18	460,188	*308,503	151,685	120,468	31,217
10m., Oct., '17	454,347	*281,900	172,447	116,839	55,609

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEXAS.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Aug., '18	\$94,589	*\$59,658	\$34,931	\$14,315	\$20,616
1m., Aug., '17	79,889	*45,938	33,951	12,419	22,535
12m., Aug., '18	1,054,375	*\$86,760	467,615	153,682	331,079
12m., Aug., '17	1,16,137	*\$68,222	417,915	125,164	330,752

EL PASO (TEX.) ELECTRIC COMPANY

1m., Sept., '18	\$104,289	*\$73,645	\$30,644	\$6,774	\$23,900
1m., Sept., '17	107,017	*\$67,806	37,211	6,592	30,619
12m., Sept., '18	1,261,203	*\$845,119	416,084	80,002	336,082
12m., Sept., '17	1,278,051	*\$67,460	510,591	63,385	447,206

LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO

1m., Oct., '18	\$176,118	*\$141,018	\$35,100	\$35,822	\$7,272
1m., Oct., '17	142,840	*107,995	34,845	35,321	1476
10m., Oct., '18	1,809,869	*1,303,542	506,327	361,112	145,215
10m., Oct., '17	1,475,625	*\$99,418	476,207	346,848	129,359

NEW YORK (N. Y.) RAILWAYS

1m., Oct., '18	\$934,683	*\$821,178	\$113,505	\$277,151	†\$120,815
1m., Oct., '17	1,103,614	*\$19,086	284,528	281,995	†\$5,022
4m., Oct., '18	3,715,819	*\$315,793	500,026	1,112,438	†\$1,238,739
4m., Oct., '17	4,388,906	*\$3,189,394	1,199,512	1,127,607	†272,795

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

Traffic and Transportation

Zone Plan Postponement

President McCarter Believes Problem Solved—Commission Grants Extension of Two Months

Thomas N. McCarter, president of the Public Service Railway, Newark, N. J., before the Public Utilities Commission on Dec. 30 requested and received an extension of two months of the period for the preparation of the zone fare report. In the order of the board of last July granting the company the right to charge 1 cent for transfers there was a stipulation that it investigate the possibilities of a zone system and submit the report of its discoveries on or before Jan. 1. The extension which has now been allowed fixes the date for delivering the report as March 1.

NEW PLAN FAIR TO ALL

Mr. McCarter declared the company believed its report would provide a zoning plan "fair to the public and fair to the company." One of the big problems, he said, had been the matter of the collection of fares as the cars pass through the zones that will exist on many of the lines, but he believed this had been solved.

In opening his statement Mr. McCarter said that immediately after the board had incorporated its zone inquiry stipulation in the July order the company had given the question serious consideration. As the first step a committee had been named, with himself as the head, to make the investigation. The other members of the committee were Richard E. Danforth, vice-president and general manager of the railway company; Harry C. Donecker, the assistant general manager; L. D. Howard Gilmour, general solicitor, and Matthew R. Boylan, general auditor.

The committee, he said, had held frequent consultations with Dr. Thomas Conway of the Wharton School of Finance, University of Pennsylvania, and that a sub-committee had later been formed by it. This committee visited every city where zones had been tried. Mr. McCarter said:

WORK OF SUB-COMMITTEE DESCRIBED

"This sub-committee has given unremitting attention to the matter. It has employed approximately 100 young men to ride the cars on given days and make tests of the riders for purposes of comparison as to lengths of rides and other facts and we think the tests made have been most comprehensive. This work took some time and involved the expenditure of a very considerable sum. There were two chief questions involved: First, it is possible to devise a plan of zoning that will be fair and acceptable to the public and

fair to the company, and second, if devised, was it practicable to collect fares? This question of the collection of fare was early recognized as a very serious matter.

"It would not be practicable to put the zone plan into immediate effect. There are numerous mechanical changes that would be necessary and these would require some time. When our report is complete we might file it as a rate schedule to bring the matter to a hearing with the possibility of making it effective July 1. I think we could be ready by that time."

In granting the time extension President Slocum of the commission said:

"The board knows the company has been working on this matter and that a serious effort is being made to meet its stipulation. It also knows that if its engineers are given access to the company's minutes no time will be lost by granting additional time, and it is therefore granted."

Columbus Fare Brief Filed

Attorneys for the Columbus Railway, Power & Light Company, Columbus, Ohio, filed a brief in the United States Supreme Court on Dec. 27 in support of the company's claim that the city cannot compel it to carry passengers at the rate of fare specified in its franchise. This is the case brought by the company in the United States District Court recently to prevent the enforcement of the terms of the franchise relative to the rate of fare and in which Judge D. C. Westenhaver announced that the court is without jurisdiction to interfere with a contract of that kind.

Arguments presented in the brief follow:

The claim of the city is based on the proposition that the two franchise grants represent contracts and that these contracts impose obligations upon the Columbus company to continue operating its street railway lines under these franchise grants and to charge the rates of fare therein described. The petition of the plaintiff and appellants may be summarized as follows:

The franchise ordinance granted permission to operate street cars on the streets of the city upon the terms and conditions therein prescribed, and the company was bound to comply with these terms and conditions so long as it continued to exercise the franchises, but these grants were permission only and have been surrendered and abandoned by the company. Its reasons for such surrender and abandonment were that the rates of fare prescribed in the grants were no longer compensatory but on the contrary had become confiscatory.

The situation that has been brought about by the war resulting in a most unexpected increase in operating expenses of all kinds and particularly the compulsory annual wage increase of \$50,000 due to the award of the National War Labor Board, cannot be held to have been within the contemplation of the parties to the franchises were granted and accepted and under these circumstances the company is entitled to a release of the obligations under which these grants may have imposed upon it to continue to operate under them.

Transfer Report Released

Results of Conferences With Washington Companies and of Independent Study Now Made Public

Sixteen transfer points, eight of which the companies already have agreed to accept, are recommended by John A. Beeler, expert for the Public Service Commission of the District of Columbia, for establishment between the lines of the Capital Traction Company, the Washington Railway & Electric Company and the Washington-Virginia Railway. The fact that this report had been made to the commission was noted in the *ELECTRIC RAILWAY JOURNAL* for Dec. 28, page 1157. The report itself, however, was not released by the commission until Dec. 26. It will be considered on Jan. 7.

The Beeler suggestions which are not concurred in by the companies contemplate the exchange of transfers at the busiest railway intersections.

Congestion will be increased at these intersections and Mr. Beeler points out the companies may not be able to carry all the passengers who will want to make use of the transfer privilege. They can, however, even during this period, carry some of them, and during a greater part of the day carry all of them.

Objection of the companies to transferring passengers from suburban to city lines develops in the report as being the biggest stumbling block in the way of universal transfers. It is the crux of the entire situation, Mr. Beeler declares. The companies agree, he states, that, once this is solved to the satisfaction of all parties, the principal difficulty will have been removed.

The reasons given by the companies for their objection to transferring suburban passengers to city lines follow:

1. The suburban passenger is now receiving more than full value for the fare he gives the company, and, therefore, no extension should be made for the benefit of a class already being served at a loss.

2. The long suburban lines have been built and operated with the idea that they should act as feeders only to the lines of the company that is sustaining and developing them. To open these lines as feeders to another company which bore no part of the expense of development appears to the companies unjust as well as a source of financial loss.

Figures are presented by Mr. Beeler in support of his conclusion that inter-company transfers will not affect materially the financial interests of the companies. He points out that at five of the transfer points recommended paid inter-company transfers now are in effect. He proposes that the transfer arrangements outlined in his report shall receive a trial during a period sufficient to determine what the exact financial results will be. If it develops that an injustice is being done by the issuance of free inter-company transfers, an arrangement should be made to compensate the companies.

Renew Fare Pleas

New York Companies Point Out Where
in Conditions Under Five-Cent
Fare Spell Disaster

Theodore P. Shonts, president of the Interborough Rapid Transit Company, New York, N. Y., in a letter to the Public Service Commission and the Board of Estimate, made public on Jan. 1, urged 8-cent fares on that company's subway and elevated lines and wrote in detail "of the serious situation confronting the dual subway enterprise." He said that the city could gain nothing by starving the Interborough into bankruptcy.

COMPANY AND CITY PARTNERS

In his letter Mr. Shonts describes the situation of the Interborough with the pooling arrangement between the company and the city in effect. At the outset he gives the history of the dual system, and tells of the invitation by the city for the company to share in the enterprise. The plan, he says, provided that the Interborough should contribute \$58,000,000, estimated at that time as one-half the cost. The agreement called upon the company to supply an additional \$22,000,000 for equipment. The Interborough, he says, raised \$160,000,000 by the sale of 5 per cent first and refunding bonds for both subway and elevated improvements. Then the letter says:

In view of the interest of the city and its taxpayers in the matter, it seems incumbent upon the company again to advise you, as the taxpayers' representatives, of the serious situation confronting the dual subway enterprise. The Interborough had accumulated a cash surplus of \$10,400,000 out of which to take care of operating losses during the lean years heretofore mentioned. Had it not been for the war such a sum would have been ample, with a 5-cent fare. But it is no longer adequate, and it is rapidly being exhausted.

For the year ended June 30, 1918, there was a deficit of subway earnings of \$620,438 and of elevated earnings of \$2,306,810 compared with the amounts the company was entitled to receive under its contracts. These deficits are payable out of future revenues, with interest compounded semi-annually, before the city is entitled to any share in either subway or elevated earnings.

For the fiscal year ending June 30, 1919, the outlook is much worse. According to the actual figures for the four months ending Oct. 31, 1918, the trend indicates that on June 30, 1919, the deficit under the subway contract will be \$2,837,000, and under the elevated contracts, \$4,952,000, or a total accrued for the year of \$8,829,000 ahead of the city's right to a return for the year ending June 30, 1919. To this must be added the accruals of last year, so that the aggregate subway accruals as of June 30, 1919, without interest, will be \$4,507,438, and the elevated accruals, also without interest, \$7,258,818, or a total of \$11,766,256.

If the fare be increased to 8 cents, recourse to taxation will not only be prevented but the city will receive from the Interborough lines over \$2,000,000 in cash into its treasury.

The Interborough Company is entitled to borrow cash against the accruals and thus continue in possession of the property under the leases. But if for any reason it should not be able to raise the money because the city kept it down to a 5-cent fare, and a receivership should follow, the situation would not be changed so far as the city is concerned—indeed, it might be worse, because receivership certificates might be issued, which would be a paramount lien, thus setting the city's investment further to the rear.

The city can gain nothing by starving the Interborough into bankruptcy. On the contrary, it can indirectly do itself great financial damage through the impairment

of approximately \$500,000,000 of securities in the combined Interborough system.

It is with great reluctance that the word panic is used in this communication, but the time has come for plain speaking, and it would be a failure of duty to one partner in an enterprise not to point out that the bankruptcy of the other partner might be so disastrous as to result in a financial catastrophe.

The city may by continued refusal to increase fares precipitate bankruptcy and thus solve the problem of the 5-cent fare to escape ruinous taxation. If the city were in possession of the railroads a continuation of a 5-cent fare would be at the expense of the taxpayers and contrary to the spirit of the rapid transit act.

B. R. T. MUST HAVE MORE

Timothy S. Williams, president of the Brooklyn Rapid Transit Company, said on Jan. 1 that without doubt renewed efforts would be made to secure authority to charge a 7-cent fare. He referred to the fact that many cities had permitted the electric railways to increase their fares to 6 and 7 cents. He discussed the "antagonistic attitude" of the Public Service Commission and the Board of Estimate, and of the delay in completing the rapid transit lines.

Indianapolis Denied Six Cents

As the result of an opinion of E. I. Lewis, chairman of the Public Service Commission of Indiana, and concurred in by the other members of the commission, the Indianapolis Traction & Terminal Company has been denied an increase in fare to 6 cents. The company is, however, permitted to continue to charge a 5-cent fare until 100 days after the signing of the treaty of peace, but it was instructed to withdraw the 1-cent charge for transfers on Dec. 31. The commission says that in spite of the apparent increase in facilities the service rendered by the company remains inadequate. On the important point of a return on the investment the commission says in part:

Petitioner does not plead for an order based on return on reasonable and prudent investment. The plea is for an order establishing rates that will maintain the solvency of petitioner by the payment of existing expenses and "maturing obligations."

In its original decision the commission passed finally and negatively on petitioner's contentions that fixed charges of securities, issued and outstanding, constituted legal and binding obligations which the State must assume and which, in the absence of the Legislature which declines to recognize, even in acting under the emergency section, the existence of an actual sinking fund charges as an obligation of protraction.

The commission reiterates its declaration that it will not become confused as to the mandate of the Legislature which, according to the interpretation under which it proceeds, is to take the value of the property, used and useful for the service of the public as a basis for rates.

It is inconceivable that the Legislature, in the enactment of section 122, contemplated that the State should (1) guarantee, in times of emergency, values which never existed; (2) protect excess securities; (3) make good losses caused by negligence in collection of revenues, or (4) reward a lack of thrift in times of prosperity.

The emergency section does not seem even to extend to the most meritorious petitioner the assurance of a return on investment that might be desired to give the proper rate of return in a normal period. To use the emergency section to protect obligations for which the commission is unable to find some reasonable basis in the proper rate of return to making the State the protector of unwarranted obligations at the very time when there is a strong tendency for legislation to restrict issuance of unwarranted securities of all kinds.

Fare Advance Voted

Residents of Cedar Rapids Go on
Record in Favor of Fare
Advance

In an election held on Dec. 17, the Cedar Rapids & Marion City Railway was authorized to increase its fares to 6 cents. The increase was carried by a majority of seventy-eight. It went into effect at once. Previous to the election a commission made up of representatives of the Chamber of Commerce, union labor and leading citizens recommended to the City Council of Cedar Rapids that the increase be granted.

TWO COMPANIES AFFECTED

The fares on the lines of the Iowa Railway & Light Company, which also operates in Cedar Rapids, were not covered by city franchise, but the Cedar Rapids & Iowa City Railway, which is included in the system of the Iowa Railway & Light Company, assumed a 6-cent fare at the time that rate was granted to the Cedar Rapids & Marion City Railway.

Last February the local branch of the railway union submitted a new wage demand to the Cedar Rapids & Marion City Railway. The matter was debated for several weeks. Finally the men were informed that the increase in wage would be allowed effective at once provided the City Council would grant an increase in fares. The Council found itself powerless to do anything under the terms of the franchise, but after it was suggested that the matter be left to a vote of the people the Council gave its consent.

The local Chamber of Commerce and the Federation of Labor indorsed the 6-cent fare and during the ten days previous to the election made an open and vigorous campaign in its favor. Public speakers were sent into the wards where the working people live and the matter was placed squarely before them. The voters were informed that if the measure was defeated it would almost certainly mean unsatisfactory service and might even result in the abandonment of some lines. The railway took no part in advocating the increase. There was no advertising campaign through the newspapers, no appeal to the public. The newspapers merely printed the news of the campaign as it progressed.

OPPOSITION FROM UNEXPECTED QUARTERS

Some opposition developed to the proposed increase in fares, but the vote in the wards inhabited by those dependent almost entirely on the railway for transportation was "yes" while the "no" vote was cast in the wealthier wards.

The Cedar Rapids & Marion City Railway is controlled by the United Light & Railways Company. It operates in all 27.5 miles of line, a considerable part of which is in Cedar Rapids.

Cincinnati Fare Increases Automatically

Under an automatic provision of the revised railway franchise in Cincinnati, Ohio, the rate of fare on the lines of the Cincinnati Traction Company for adults was advanced to 5½ cents on Jan. 1, 1919. At the same time children's fares were made one-half of the adult fare or an advance of ¼ cent. Official announcement to this effect was made by W. C. Culkins, street railroad director, following receipt of a letter from Walter A. Draper, vice-president of the Cincinnati Traction Company, notifying him that the earnings during October and November had been insufficient to meet operating expenses. Beginning Jan. 1 six adult tickets for 33 cents and four children's tickets for 11 cents were placed on sale. Cash fares for adults are now 6 cents and for children 3 cents. The new franchise provides that fares shall be increased ½ cent if for the period of two calendar months the income of the city lines is not sufficient to cover the cost of service.

Transportation News Notes

Brooklyn Skip Stops to Go.—The Public Service Commission for the First District of New York has ordered the Brooklyn Rapid Transit Company to discontinue skip stops.

Committee Reports on Louisville Fare.—A committee of the Board of Trade of Louisville, Ky., which has been investigating earnings and expenses of the Louisville Railway Company before recommending an increase in fares, has reported back to the board, but no definite action has been taken as yet.

Westerville Line May Increase Fares.—Indications point to an increase in the rates of fare on the Columbus-Westerville line of the Columbus Railway, Power & Light Company, Columbus, Ohio, according to Commissioner John Scott. The working capital is now only slightly above \$15,000, which marks the turning point. The road fell short in November and he believes this will be repeated for December.

Fare Case Carried to Court.—The Dubuque (Iowa) Electric Company plans to take the half-fare ticket case before the United States Circuit Court of Appeals at St. Paul. City Attorney Czizek has been asked by the company to agree to the filing of a supersedeas bond which would protect the patrons of the company against loss but would result in the discontinuance of the sale of half-fare tickets until an opinion is handed down by the appeals court.

Colorado Springs Wants More.—The petition of the Colorado Springs & In-

terurban Railway, Colorado Springs, Col., for an increased fare, which was announced some time ago, has been filed with the Public Utilities Commission of Colorado. While no definite figure was asked, attorneys for the company feel that a 7-cent fare would be justified, because of the proposed increase in wages to employees to meet the scale in other cities and the rapidly mounting costs of materials and other factors in operation.

Michigan Two-Cent Fare Law Valid.—Federal Judge Sessions, in a decision handed down in the case brought by the Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich., against the State to test Michigan's 2-cent fare law and restrain the State from enforcing it, held that the law is valid. He dismissed the company's petition, which was based on the grounds that the law was confiscatory on account of war-time conditions. This suit was referred to previously in the *ELECTRIC RAILWAY JOURNAL* for July 27, page 173, and Oct. 12, page 676.

Weymouth Refuses Subsidy.—Residents of East Weymouth, Mass., at a special town meeting recently, retorted to a notification from the Bay State Street Railway that certain lines in the town would be discontinued, with a recommendation that in the event of discontinuance of service by the road, the local authorities be urged to revoke the grants of location under which the company is operating in the town and take steps to remove all poles, rails and equipment from the streets. A motion was adopted pronouncing inadvisable a proposal for the town to contribute \$13,500 to the company to enable it to continue certain lines.

City Contends Cases Differ.—The decision of the Supreme Court of Missouri in the so-called St. Louis 6-cent fare case, referred to in the *ELECTRIC RAILWAY JOURNAL* for Dec. 28, page 1155, is said not to affect Kansas City, except as indicating the possible decision of the court in the Kansas City case. City officials of Kansas City, Mo., indicate that the position of Kansas City is different from that of St. Louis; and that even if a decision is rendered that is favorable to the local railway the city will appeal. In the St. Louis case the Supreme Court overruled the lower court and held that the commission was within its rights in authorizing a 6-cent fare.

Auburn Waives Fare Clause.—The Common Council of Auburn, N. Y., by unanimous vote, has adopted a resolution whereby the city of Auburn has waived the electric railway franchise contract clause prohibiting a charge of more than 5 cents on city lines, to Owasco Lake and Soule Cemetery, thus making it possible for the Auburn & Syracuse Railway to go before the Public Service Commission with its application for an advance in fares. The resolution adopted by the Council waives the prohibitory clause for the period of the war, or until peace is

finally declared, and for such a length of time thereafter as the Council shall deem wise.

Grand Rapids Increase in Effect.—The Grand Rapids (Mich.) Railway began charging a 6-cent fare on Dec. 5 in accordance with permission recently granted by the City Commission and noted in the *ELECTRIC RAILWAY JOURNAL* for Nov. 16, page 904. The City Commission, however, made the fare ordinance subject to the will of the people at the November election on a referendum petition. No petitions were filed against the increased fare and it, therefore, went into effect without having come to a vote. Unusual interest attached to the Grand Rapids appeal because of the way in which the local papers met the fare issue. This phase of the matter was referred to in this paper for Sept. 28, page 594.

Wants Additional Omaha Facts.—The State Railway Commission of Nebraska has denied the application of the Omaha & Council Bluffs Street Railway for an emergency increase in fares from 5 cents to 7 cents. The commission has, however, continued the application for further hearing and directed that the books of the company be examined and a valuation of the company's holdings be made in order to arrive at a final decision. The commission says it does not deny that the company should be granted an increase to meet the increased operating expenses, but that the company's valuation figures submitted with the application were not sufficient to form an opinion as to how much the advance in rates should be.

Rochester Still Needs More.—James F. Hamilton, president of the New York State Railways, has made a statement in part as follows about fares in Rochester: "We are still trying to get a 6-cent fare in Rochester. The reduction of service during January, even if it became permanent, would save the company only \$650 a day. When the first fall of snow comes the company must put on 100 men to clear the tracks and this will use up \$400 a day of the saving made by the reduction of service. The balance will be expended for equipment. This amount is not a drop in the bucket. We are losing money in the Rochester district every day we operate. We have lost \$1,000,000 in the last eighteen months. We are not asking for a permanent 6-cent fare, but for an increase that will enable us to give good service and pay the interest on our bonds during the unusual conditions prevailing of high prices for material and labor. A 6-cent fare would not return a cent in dividends to the stockholders, but would give the people good service and pay the interest on the bonds." The reduction in service to which Mr. Hamilton refers was decided upon after conference with the Public Service Commission for the Second District. It was referred to in the *ELECTRIC RAILWAY JOURNAL* for Dec. 21, page 1118.

Personal Mention

P. R. T. Changes

Charles V. Weston, George Weston and Horace L. Howell Appointed to the Philadelphia Rapid Transit Company

Charles V. Weston has been appointed operating manager of the elevated and subway lines of the Philadelphia (Pa.) Rapid Transit Company. Mr. Weston was formerly president of the South Side Elevated Railroad, which is now a part of the Chicago Elevated Railroads. He has taken an active part in the development of Chicago's rapid transit system, having supervised the construction of the West Chicago Street Railroad tunnel in 1891-94 and having been chief engineer of the construction of the Northwestern Elevated and Union Loop, as well as of many extensions of the Lake Street Elevated and South Side Elevated. Since his resignation from the presidency of the South Side Elevated, following the consolidation of the Chicago elevated lines, Mr. Weston has been engaged largely in valuation and other expert work for electric railways.

GEORGE WESTON ALSO GOES TO PHILADELPHIA

George Weston, engineer for the Board of Supervising Engineers, Chicago Traction, has resigned his position, effective Jan. 1, and will also become associated with the same company. Mr. Weston has been engaged in electric railway work for the past thirty-one years. He received his training in civil engineering by private instruction and entered engineering work in 1880 on the Missouri, Kansas & Texas Railway at the age of nineteen years. Since that time he has done engineering work on various steam lines, has established a reputation as an appraisal engineer of electric railway properties and has been engaged in the construction and engineering operation of electric railways in the city of Chicago for many years.

GEORGE WESTON ON CHICAGO BOARD SINCE ITS CREATION

Upon the creation of the Board of Supervising Engineers at Chicago, in 1907, Mr. Weston was made assistant chief engineer. In 1908 he became a member of the Board of Supervising Engineers to represent the city of Chicago and later became engineer for the board, which position he has held to date. Mr. Weston is a member of the American Society of Civil Engineers, American Institute of Electrical Engineers, Western Society of Engineers, Chicago Engineers' Club, Engineers' Club of New York City, and the

American Electric Railway Association.

Horace L. Howell, who has for the past five years been connected with the Board of Supervising Engineers, Chicago Traction, in the capacity of assistant engineer, has resigned and has also accepted a position with the Philadelphia Rapid Transit Company.

Mr. Jackson New Boston Trustee

James F. Jackson of Boston, former chairman of the Massachusetts Railroad Commission, has been appointed a trustee of the Boston Elevated Railway to fill the vacancy caused by the resignation of W. M. Butler, former chairman of the board. The nomination was confirmed by the executive council on Dec. 31 under suspension of the rules.

Mr. Jackson is a native of Taunton, Mass. He was educated at Harvard College and Boston University, graduating from the law school of the latter in 1875. He was city solicitor of Fall River from 1880 to 1889 with the exception of one year, and was elected Mayor of that city on the Republican ticket in 1888 and again in 1889. From 1899 to 1908 he was chairman of the Massachusetts Railroad Commission, predecessor of the Massachusetts Public Service Commission, and his term was signalized by distinguished and constructive service in electric railway regulation, coupled with unusual ability in clearly stating the essentials of complex issues before the board.

Since retiring from the commission, Mr. Jackson has been engaged in private law practice at Boston, having represented the Bay State Street Railway as general counsel in various rate proceedings and other matters. To a representative of the ELECTRIC RAILWAY JOURNAL Wednesday Mr. Jackson expressed his appreciation of the present difficulties of the electric railway financial problem, pointing out the importance of transportation and the interest with which his new duties will be undertaken.

E. W. Tynan has been appointed claim agent of the New York, Westchester & Boston Railway, New York, N. Y., to succeed W. A. Cokerly.

R. E. Town has been appointed auditor of the Chambersburg, Greencastle & Waynesboro Street Railway, Waynesboro, Pa., to succeed C. W. Clover.

C. C. Yawkey, formerly vice-president of the Wisconsin Valley Electric Company, Wausau, Wis., has been elected president of the company to succeed Neil Brown.

G. C. Blankner and G. G. Brownell have been appointed assistant secre-

taries of the Cities Service Company, New York, N. Y., to succeed Carle B. Gilbert.

Judson Zimmer, master mechanic of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., has also been appointed to succeed F. A. Bagg, resigned.

E. F. Meyers, treasurer of the Philadelphia & Garrettsford Street Railway, Upper Darby, Pa., has also been appointed secretary of the company to succeed V. A. Hengst.

G. A. Roffe has been appointed general manager and purchasing agent of the Susquehanna Traction Company, Lock Haven, Pa., to succeed T. C. Keller.

L. A. Reinhardt has been appointed assistant secretary and assistant treasurer of the Eastern Pennsylvania Railways, Pottsville, Pa., to succeed W. C. Austin.

F. P. Bagley, formerly treasurer of the Center & Clearfield Railway, Philipsburg, Pa., has been appointed assistant secretary of the company to succeed F. W. Gregory.

Stephen C. Popho has been appointed vice-president and general manager of the Center & Clearfield Railway, Philipsburg, Pa., to succeed Warren Partridge.

Joseph B. Eastman of Massachusetts has been named a member of the Interstate Commerce Commission, vice George W. Anderson, whose term of office has expired.

B. D. Haskins has been appointed claim agent of the Chattanooga Railway & Light Company and the Look-out Mountain Railway, Chattanooga, Tenn., to succeed M. J. Horan.

B. F. Wilson has been elected vice-president of the Wisconsin Valley Electric Company, Wausau, Wis., to succeed C. C. Yawkey, who has been elected president of the company.

J. R. Hagy has been appointed secretary and treasurer of the City Electric Company, Albuquerque, N. M., to succeed Lloyd Sturges, who has been elected vice-president of the company.

George A. Peirce has been appointed secretary of the Puget Sound Traction, Light & Power Company and subsidiary companies, with headquarters at Boston, Mass., to succeed T. C. Crawford.

Benjamin C. Bower has been appointed master mechanic of the Trenton & Mercer County Traction Corporation, Trenton, N. J., to succeed H. M. Rhoda.

C. E. Fritts, superintendent of power and electrical distribution of the Kansas City (Mo.) Railways, has resigned. Mr. Fritts had been connected with the company for twenty-one years.

B. F. Mortimer, formerly with the Public Service Company of Oklahoma, has accepted a position as superintendent of distribution with the Okmulgee Ice & Light Company, Okmulgee, Okla.

R. E. Morrison has been appointed engineer maintenance of way of the

Chattanooga Railway & Light Company and the Lookout Mountain Railway, Chattanooga, Tenn., to succeed E. R. Dike.

Lloyd Sturges, formerly secretary and treasurer of the City Electric Company, Albuquerque, N. M., has been elected vice-president of the company.

P. C. Eichhorn has been appointed auditor and purchasing agent of the Seattle & Rainier Valley Railway, Seattle, Wash., to succeed Frank W. Goodhue.

J. I. Newell has been appointed electrical superintendent of the British Columbia Electric Railway Company, Ltd., Vancouver, B. C., to succeed W. M. Fraser.

M. Murphy has been appointed secretary of the Seattle & Rainier Valley Railway, Seattle, Wash., to succeed Walter M. Brown, who still retains his position as general manager of the company.

W. Fred Jacobs has been appointed secretary of the Danville & Sunbury Transit Company, Danville, Pa., to succeed Charles P. Hancock, who still retains his position as treasurer of the company.

Henry Ellard has been appointed chief engineer to the Trenton & Mercer County Traction Corporation, Trenton, N. J., to succeed A. E. Gulliver, who resigned to engage in special work for the British government pertaining to marine operations.

Charles Zoller has been named superintendent of the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., to succeed Lewis Henry, deceased. Mr. Zoller has been acting as claim agent of the company for some time. He will have his headquarters at Rushville, Ind.

J. H. Vanderveer has recently been appointed master mechanic of the Maryland Electric Railways at Annapolis, Md. He was for five years in the engineering department of Stone & Webster, specializing on the development of the one-man car. He is a graduate of Stevens Institute of Technology.

H. R. Palmer, chief of the lighting and power department of the Virginia Railway & Power Company, supplying railway service and electric light and power to Richmond and other cities of Virginia, will become general manager of the Harrisburg Light & Power Company, Harrisburg, Pa., to succeed C. M. Kaltwasser, vice-president and general manager of the company.

H. A. Nicholl, general manager of the Union Traction Company of Indiana, Anderson, Ind., has returned to Indiana from Hampton Roads, Va., where for several months he was government manager of transportation of the Hampton Roads district. The position in Virginia was a new one for the period of the war and Mr. Nicholl was granted leave of absence by the Union Traction Company in order to assume the place.

Matthew C. Brush, who has been vice-president of the American International Corporation, New York City, has been elected president of the American International Shipbuilding Corporation. The corporation is engaged in shipbuilding, having the largest shipyard in the world, that at Hog Island, Philadelphia, Pa. On Oct. 28, 1918, Mr. Brush was elected chairman of the board of directors of the Boston Elevated Railway.

Daniel A. Scanlon has been appointed acting superintendent of transportation of the Northern Ohio Traction & Light Company with headquarters at Akron, Ohio, succeeding Frank I. Hardy, resigned. For the last fourteen years Mr. Scanlon has been superintendent of the Southern Division of the Northern Ohio Traction & Light Company, with headquarters at Canton, Ohio. Prior to that time he was connected with the Raleigh (N. C.) Traction Company and the Columbus, Buckeye Lake & Newark Railway, Springfield, Ohio.

Edgar Harrison, appointed division passenger and freight agent of the Union Traction Company of Indiana at Anderson, has been with the Union Traction Company since Feb. 5, 1903, commencing as a motorman on the city lines at Anderson. He was on several divisions of the Union Traction as trainman, and knows the system well. He is studious and very observing and in order to qualify for advancements has recently completed successfully special studies in traffic work during his leisure.

General H. T. Douglas, who has been connected with the work of construction of the Interborough Rapid Transit Company, New York, N. Y., as principal assistant engineer of the Rapid Transit Subway Construction Company since December, 1899, has retired from service. He took an important part in the construction of the subways from the beginning until their completion, and gave to the work not only his engineering skill and untiring energy, but the benefit of a very broad and varied experience in railroad and engineering work.

B. N. Grosvenor, recently appointed superintendent of power plants of the Union Traction Company of Indiana, succeeding E. E. Jones, has had considerable experience in the mechanical and steam engineering line. He started as a machinist, and from that calling was made assistant to the professor of steam engineering, at the Rose Polytechnic Institute, at Terre Haute. He left there to take charge of the power plant of the Louisville (Ky.) Railway, where he was located for seven years. After leaving the Louisville Railway, Mr. Grosvenor was in charge of the River Station of the Louisville Water Company for ten years.

Percy S. Turner, manager of the tramway department of the British Westinghouse Electric Company, London, is in this country investigating

the latest designs of electric car equipment used with high voltage installations. A more extended electrification of steam lines in England is considered desirable by most of the present railway officials. If the government takes over the lines according to the program already outlined, extended electrification may be postponed as the work will then, of course, depend on the attitude taken by the government. The various manufacturers are preparing to build any new equipment necessary in their own plants.

Obituary

George H. Harvey, general superintendent of construction for the Columbus Railway, Power & Light Company, Columbus, Ohio, died at his home in Columbus on Dec. 20 from influenza and pneumonia.

Maj. Charles B. Clegg, president of the Oakwood Street Railway, Dayton, Ohio, died on Dec. 16 after a long illness. Mr. Clegg became interested in Dayton railway properties when horse cars were used. He and John H. Winters, a banker, secured the controlling interest in the Dayton & Western Traction Company and assisted in completing the road. In conjunction with his son, Harrie P. Clegg, now an officer of the Dayton & Troy Electric Railway, the Oakwood Railroad and the Oakwood Street Railway, Dayton, he built the Dayton & Troy Traction line. Mr. Clegg was seventy-six years of age.

Angus Sinclair, Eng. D., publisher of *Railway & Locomotive Engineering* and for many years treasurer of the American Railway Master Mechanics' Association, died at his home in Milburn, N. J., on Jan. 1. He was seventy-seven years old. Mr. Sinclair was born in Scotland, where he received his early education. After coming to the United States he studied engineering at the University of Iowa. He received his degree of doctor of engineering from Purdue University. Mr. Sinclair at one time was editor of the *American Machinist* and later of the *National Car Builder*. In 1886 he established, with the late John A. Hill, the *National Engineer*, whose name was later changed to *Railway & Locomotive Engineering*, the paper with which he has been actively associated during recent years. In addition to his connection with the American Railway Master Mechanics' Association, of which he has been treasurer since 1901, Mr. Sinclair has been identified with many technical associations, among them the American Society of Mechanical Engineers, the Master Car Builders' Association, the Air Brake Club and the Travelling Engineers' Association. He was one of the founders of the last mentioned organization.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,

SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

Volume of Purchasing Low During 1918

Review of Production, Distribution and Sales of Electric Railway Equipment During Past Twelve Months

A year mixed with good and bad business has just closed. On the whole the electric railways purchased less during 1918 than during any one of the last ten years. Here and there a business booked an extraordinary large volume of sales. In such cases the article in question was as a rule something comparatively new on the market and for which a demand had arisen on account of the abnormal conditions created by the war.

Pneumatic door-control equipment and one-man car devices, for instance, sold well. Devices to increase economy had the largest call. Each of the different types of devices for giving readings whereby it is possible to reduce the energy consumption per car-mile were in good demand.

MORE CARS PURCHASED THAN IN 1917

Besides, the war brought large sales in specific localities. Wherever there were shipyards or large industrial centers employed in war work the transportation facilities as a rule were found insufficient and additional rolling stock was required. As a result a number of large orders for rolling stock were placed during the year. These brought the total purchases of cars of all kinds for 1918 beyond that for 1917 by a hundred or so. The total number of new cars built in 1918 was 2419 against 2455 in 1917. However, only eighty-nine cars were built in railway company shops in 1918 while 281 were so built in 1917.

It is interesting to see the stride taken by the one-man car in 1918. Of this type 644 were ordered against but 280 in 1917. That this type is beginning to play a large part in the rolling-stock market is seen by comparing the 1918 orders for both one-man and two-man city cars. Of the latter the 1918 orders reached 1074, but 450 more than the one-man total. One car builder in August stated that fully 90 per cent of the year's inquiries for city cars were for the one-man type.

Nor is that all. The rolling-stock orders were not as large as they might have been had deliveries been better. Reports have been received from more than one road that owing to the length of time that they would have to wait it was decided best to postpone purchasing. Shipments, however, were not as bad as was generally believed.

Late in February prominent car builders notified the *ELECTRIC RAILWAY JOURNAL* that shipments could be had in from five to six months. On top of this, however, the railways had to wait some time depending on transportation. If the orders were war transportation orders delivery could be secured more promptly.

Fussiness of car design was not tolerated last year by the builders. Standard design was the rule. If special construction was desired the purchaser found that promised delivery became quite too long.

The conditions of long delivery and immediate requirements resulted in a number of roads going into the used-car market. Little help was here found. Some managers are known to have traveled hundreds and hundreds of miles in an effort to locate and secure a few used cars. Probably at no other time has the market been so bare of second-hand rolling stock. As the year closed conditions were much easier and cars could be secured without any trouble.

Track construction and maintenance offered a very poor field for sales in 1918. Some 410 miles, or less than 1 per cent, was added to the total track mileage. About 150 miles of track was rebuilt out of a total of almost 50,000 miles. Almost all of this work was in small sections.

GOVERNMENT TAKES RAIL OUTPUT

To a large extent, of course, it must be remembered that war requirements prevented purchasing for track construction and maintenance. Some roads were favored in securing new track because of making extensions to shipyards or other war plants. Speaking generally there were no rails available for electric railways last year until after the armistice was signed, when a few tons were shipped on back orders.

Government orders called for a greater production of rails than the mills could handle. There were some rails that had been rolled for Russian roads that were offered for domestic consumption. As a makeshift it is understood that some of these were used by electric roads.

Freight handling for the electric roads opened on the Pacific Coast and elsewhere and to take care of this

there was some purchasing of freight cars and trailers although most of such rolling stock was probably built in company shops.

The severity of the winter early last year made for a nice volume of buying in some lines. Trolley wire sold very well for maintenance because of the snow storms. Snow and ice removal equipment was in a brisk demand, especially scrapers, sleet cutters and thawing apparatus. Also there was a large demand in January for immediate delivery of snowplows. These, however, are not kept in stock and take some time to build so that this market went unsatisfied. It is interesting to note in this connection that very few orders were placed during the spring and summer months for snowplows and sweepers.

MAINTENANCE PROMPTS BUYING

Winter conditions also brought a heavy demand for coils. Sales of these continued in good volume throughout the year. Railways formerly used to do most of their coil winding in their own shops but the scarcity of labor in the past year prevented much of this work. This resulted in large sales by the manufacturers.

Maintenance needs prompted most of the buying by traction companies. Welding outfits were in good demand. The necessity for conserving old material added increased duties to welding equipment for shop use and for repairing tracks, and lines.

The carbon brush market was active throughout the year. Car wheel sales were limited to maintenance needs. Car roofing, on the other hand, was very quiet.

In many lines owing to a demand from other than electric railways there was a shortage during the year. These included such items as track and track hardware, construction and track tools and tool handles, window glass and shop equipment.

In many of these lines production was curtailed because of the necessity for conservation of raw materials, transportation, fuel and labor. All tool production was reduced considerably in the number of types and sizes. Metal badges for platform men, condenser equipment many lines of electrical equipment, all were curtailed. These restrictions were removed shortly after the armistice was signed.

On July 26 the War Trade Board placed restrictions on the importation of rattan. Manufacturers of car seating, track sweepers and brooms, how-

ever, were sufficiently well fixed so that the industry never suffered from a shortage of supply. This restriction, also has been lifted.

Railway motor demand was not very active. One manufacturing concern early made up a fair stock but otherwise motors were built as ordered.

In the summer months there was a renewed interest in fare boxes. A considerable demand arose also for slack adjusters, owing to labor shortage and conservation measures. These were shipped in carload quantities.

Deliveries varied considerably. On much small equipment there were good stocks available and immediate shipments could be made. On large equipment, however, such as poles, deliveries were greatly delayed owing to transportation troubles.

PRICES WERE HIGHER IN 1918

Prices continued to mount during the year in spite of the small demand from traction companies. There is hardly an item that did not advance in price at least once—rolling stock, track, hardware, paints, glass, etc.—all except wire—hit new high levels. Wire on the average was lower than in 1917 because copper was much lower.

Cotton was by no means an insignificant factor in the year's higher prices. Trolley, bell and register cord, insulated wire, waste cotton, coils and insulation reflected the advancing cost of cotton.

As the year closed some prices came down. The most conspicuous ones were rails and wire.

What to do with scrap became a real question for many roads last year. Scrap iron and steel and other old metals brought high prices up to the time the armistice was signed, when the bottom fairly dropped out of this market. Whether to sell for the high prices or to hold for repair and further use came up continually. The government fixed maximum prices for scrap iron and steel. For old rails \$35 per ton was allowed and \$47.50 for old railway axles. Owing to conditions of the market railways were not always able to dispose of their holdings at such high prices. Nevertheless, much more was realized for scrap in 1918 than ever before.

Electric railway credits received more than the usual scrutiny in the year just past. On the whole, however, collections were in good shape considering the conditions. Not so many roads took advantage of the cash discount as formerly, and also settlements took longer generally than they used to. Still they were made.

Up to Nov. 11 electrical manufacturers were generally working to the extent that they could get labor to operate the machinery. Since that time there have been many cancellations of war and other contracts, and incoming business is now small. The total output of electrical goods for the year was probably no larger than in 1917, which was in the neighborhood of \$750,000,-

000. Throughout the year labor first and raw materials second have been the controlling factors. In addition to a very acute shortage of each, labor has been very undependable. Dilution was tried and found in most instances to work very well. Women as a rule were found to be more dependable in the work in which they were employed than men.

Wage scales for industrial labor advanced by leaps and bounds. The government labor board did much to prevent loss of time through strikes, but it pretty generally recommended higher wages and the shortening of working time to eight hours. This latter did not actually shorten the hours of work but materially increased wages by making it possible to get in more overtime work. Labor priorities were outlined, and in one instance in the industry labor was in serious danger of being drafted.

Raw materials, particularly iron, steel, copper, tin and brass, were insufficient to supply the demand. Substitutes were urged, particularly for brass. Prices of these products were fixed by the government with provisions for maximum output, but even so there was not enough, to go around. The natural result was that along in the summer the War Industries Board began to limit the supply of raw materials through priority certificates in accordance with the essential character of the production. Nothing was termed non-essential, but many lines of production were considered less essential to the winning of the war than others.

POWER EQUIPMENT MARKET

Large power equipment was hard to get throughout the year. Turbines of over 500 hp. were taken under complete government control as to distribution. After the fighting stopped deliveries on large turbines were quoted at four months and longer, depending on the condition of the individual factories. At the close of the year there was still a large volume of unfilled business in steam turbines.

The transformer demand was not so large last year as in the preceding year. In April it was reported to be down to about 70 per cent of that for 1917.

Around the first of June power equipment, including motors, generators, turbines, transformers, etc., advanced around 10 per cent.

A number of manufacturers began to study the export field during the year. There were quantities of inquiries from South America, but the ban on shipping made it hard to do business. However, as soon as the war ceased the manufacturers began to show unusual activity.

Metal prices, generally speaking, were much lower at the close of the year than at the opening. Copper, which owing to the continuance of the government price of 26 cents until Jan. 1, is apparently higher, was ac-

tually being offered for resale during the last two weeks of the year at 21 cents. Producers late in December agreed on a price of 23 cents for export.

All Priorities Are Officially Canceled

Formal Announcement Made of the Passing of Priorities Rules and Pledges on Jan. 1

Circular No. 60 of the Priorities Division of the War Industries Board, addressed to all concerned, says: "Effective Jan. 1, 1919, all the rules, regulations and directions of every nature whatsoever issued by the Priorities Division of the War Industries Board are hereby canceled, and all pledges heretofore made on the suggestion or request of the said Priorities Division are hereby revoked."

This is signed by Edwin B. Parker, Priorities Commissioner, and approved by Bernard M. Baruch, Chairman War Industries Board. It is dated Dec. 20.

Dick, Kerr & Company's Annual Report

The annual meeting of Dick, Kerr & Company, Ltd., was held in London on Nov. 14, and important plans of the future were outlined by the chairman. He referred to the acquisition as announced last year of the bulk of "B" preference stocks of Willans & Robinson, Ltd., and said that the work of consolidating the organization of the company with those of Willans & Robinson and the United Electric Car Company has been completed. An alliance has also been made with Siemens Brothers & Company, Ltd., by which much economy can be effected through the amalgamation of selling organizations and co-ordination of designs and products. There is no competition in manufacture as Siemens Brothers & Company made cables, dynamo machinery, telephones, etc., while Dick, Kerr & Company have specialized in apparatus for railways and tramways, steam turbines and the larger classes of electrical machinery. It has also been decided to establish companies in France and in Japan to exploit manufacturing rights in connection with apparatus for railways and tramways. In the belief of the chairman there would be a large after-war demand for all classes of electrical machinery, especially large-sized steam turbines, and he assured the shareholders that the company's facilities for taking care of this demand would be ample.

Coal Price and Zone Regulations Continue

Maximum prices on coal and zone regulations will not be removed before Feb. 1, 1919, United States Fuel Administrator Harry A. Garfield announced recently.

Track and Roadway

Muscle Shoals Traction Company, Florence, Ala.—A second survey has been completed of part of the proposed Muscle Shoals Traction Company line between Antville and Florence, via Athens. The government has made arrangements with the Muscle Shoals Traction Company to use its material in Florence and to dispose of having the company build branch lines to Dams Nos. 2 and 3. Thurston Allen, Florence, secretary of the company, reports (Enr. Oct. 23, 1919).

Municipal Railway of San Francisco, San Francisco, Cal.—The Board of Supervisors has adopted an ordinance authorizing the Board of Public Works to prepare plans and specifications and to enter into contract for the reconstruction of tracks on a portion of Taraval Street and for the construction of a line on a portion of Brighton Street.

United Railroads of San Francisco, San Francisco, Cal.—Mayor Rolph and J. N. Lilienthal, president of the United Railroads of San Francisco, recently signed the agreement between the city and the United Railroads providing for the joint use of street railway tracks west of Twin Peaks. By the agreement the city will get the right to operate over the United Railroads tracks on Taraval Street in the Parkside district from Twentieth to Thirty-third Avenues and use of the Bechtel Avenue line between Avenue in the Ingleside section. The necessary ordinance has been passed providing for the payment by the city of the street railroads of \$100,000 for this latter privilege, while the city, under the arrangement, must reconstruct the United Railroads tracks from Twentieth to Thirty-third Avenues in the Parkside section.

United Railways & Electric Company, Baltimore, Md.—Contract and plans have been filed in Baltimore County by the United Railways & Electric Company for its proposed double-track extension to the yards of the Bethlehem Shipbuilding Corporation at Sparrows Point. The estimated cost of construction is \$145,472.

Boston, Mass.—Special investigators of the Commission on Waterways and Public Lands have started a study of the traffic over the recently inaugurated trolley freight line connecting the Fish Pier with Boston. The Boston Elevated system, in order to determine the possibilities of an extension of the service. The commission proposes, if the study is found to be practical, to have the Fish Pier line extended over the State-owned lands so that it will serve the Commonwealth Pier, the dry dock, and the embarkation terminal, which the War Department is building.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the First District of New York has approved an opinion by Commissioner F. J. H. Kracke, and has directed the preparation of a final order fixing the status of the Culver Elevated Line in Brooklyn as a branch of the Fourth Avenue line. The order will also provide that the Culver line shall be operated as a part of the Fourth Avenue subway when the Whitehall-Mott Avenue Street Tunnel line has been completed and placed in operation. This plan will require that when the new Culver elevated structure is completed the line shall be operated a month or so hence it will be operated as the present Culver line is operated, namely in connection with the Fourth Avenue elevated line in Brooklyn. Thereafter when the tunnel line is completed the Culver trains will be made up of steel cars and diverted from the Fish Pier to the station into the Fourth Avenue subway.

Power Houses, Shops and Buildings

British Columbia Electric Railway, Ltd., Vancouver, B. C.—Work will be begun next spring by the British Columbia Electric Railway on the construction of a receiving station for freight at Chilliwack.

Washington & Old Dominion Railway, Washington, D. C.—Work from the Washington & Old Dominion Railway states that it has ordered three 1000-kw. transformers, six 1000-volt, transformer substations, substitution outfit of 300-kva. transformer and rotary, etc.; also material for changing 14-mile division high-tension 22,000 volts to 10,000 volts.

Winona (Ind.) Interurban Railway.—The Winona Interurban Railway has completed the installation of a complete coal

handling apparatus in its power plant at Winona Lake, Ind. The coal is taken from the storage bins to hoppers and thence to the stokers. The equipment was furnished by the American Manufacturing Company, Chicago. The company will purchase one new wheel press and in addition one boring mill.

Pascagoula Street Railway & Power Company, Pascagoula, Miss.—It is reported that the Pascagoula Street Railway & Power Company will construct a new power plant.

Kansas City (Mo.) Railways.—A tract of land 100 ft. x 300 ft. has been purchased by the Kansas City Railways just east of the company's present carhouse on Ninth and Washington Streets and will be used by the company for the storage of cars. The company will in the near future construct a double-deck carhouse on the ground which it now owns. The difference in the street elevation makes the location particularly desirable, there being one grade on the Washington Street side and another on Ninth Street.

Yonkers (N. Y.) Traction Company.—The power plant of the Ithaca Traction Company at Ithaca was recently destroyed by fire, causing a loss of about \$75,000. The company has purchased a new plant, operating the railway system and for local lighting service and will be rebuilt immediately.

Columbus (Ohio) Depot Company.—The City Council of Columbus has passed an ordinance extending the period within which the Columbus Depot Company may begin the construction of an interurban railway station at the corner of Town and Rich Streets.

Northern Cambria Railway, Patton, Pa.—Contract has been placed by the Northern Cambria Railway with the General Electric Company, Schenectady, N. Y., for one 300-kw. motor generator set, and power will be purchased from the Pennsylvania Central Light, Heat & Power Company shortly after Jan. 1, 1919.

Philadelphia (Pa.) Rapid Transit Company.—Contract has been placed by the Philadelphia Rapid Transit Company for the construction of a one-story brick addition to the station, to be used for the storage of service in Philadelphia, to cost about \$12,000.

Dallas (Tex.) Railway.—Plans have been made by Jones & Jones, Alton, Tex., Company, Dallas, for enlarging the Interurban Building at Dallas by the erection of an 8-story addition to the 2-story portion of the building. The plan is to add a 2-story portion of the building.

Professional Notes

V. I. Smart, formerly professor of railway engineering and transportation at McGill University, Montreal, and J. A. Burnett formerly electrical engineer with the Grand Trunk Railway system, are now associated as consulting engineers at the New Quirks Building, Montreal. The lines have been in civil, electrical and mechanical engineering.

Fuller Engineering Company, designing and constructing engineers, Allentown, N. J., has been formed by the merger of the company that Frederick A. Scheffer, formerly connected with the New York offices of the Babcock & Wilcox Company, has now organized with them. They will make his headquarters at their New York office, 50 Church Street. The Fuller Engineering Company is making specialty alloys using the pulverized-coal method of firing to boilers of all kinds for generating power, and is also making a specialty alloy. They furnish complete information regarding the cost of installation, preparation and probable economies obtainable by the adoption of this method of firing coal.

O. S. Lincoln, Inc., Portland, Me., was enlarged on Jan. 1 and is now known as Lincoln, Hanson & Abbott, Inc. The two partners were formerly with the Moulton Engineering Corporation, which has given up its Portland office, and one of the partners, Mr. Abbott, has returned from service with the engineers in France. The new firm will occupy the same offices but will give the scope of their work to include cover civil, mechanical, hydraulic and electrochemical engineering in addition to electrical engineering. The firm proposes to go into the business of consulting and designing engineering and management of properties with renewed energy now that the great war is making Standard Oil Company Laboratories will be retained and enlarged, leading to greater activities than have been possible in the past.

Rolling Stock

Mobile & Pensacola Railway & Navigation Company, Mobile, Ala., reports that it expects to purchase some cars during 1919.

Hydro-Electric Power Commission of Ontario, Canada, expects during 1919 to purchase six 50-ton 111 steel locomotives for the traction roads under its control.

Gulfport & Mississippi Coast Traction Company, Gulfport, Miss., reports that it expects during 1919 to purchase four four-motor street car equipments.

Norfolk & Western Railroad, Bluefield, W. Va., expects to order six electric locomotives during 1919. These locomotives will be duplicates of those now in use.

Gadsden, Bellevue & Lookout Mountain Railway, Gadsden, Ala., expects during 1919 to purchase three single truck cars, one closed and two 10 bench open cars.

Chicago, South Bend & Northern Indiana Railway and Southern Michigan Railway, both of South Bend, Ind., and under the same management, expect to purchase twenty new city car motor equipments during 1919.

Trade Notes

Maschinenfabrik Oerlikon, whose works are at Oerlikon, near Zurich, Switzerland, has recently elected a new board of directors. The nationality of its stockholders as far as it could be determined. Of the 16,000 shares outstanding, 11,144 are held by Swiss citizens and 4,856 by citizens of other nationalities. Holders of 150 shares did not reply to the inquiry. In other words, more than 94 per cent of the stock is held by citizens of Switzerland.

Wellman-Seaver-Morgan Company, Cleveland, Ohio, has opened a San Francisco office at 415 California Street, under the management of Norman S. Rose. He will give attention to business originating from California, and all West of the 100th meridian, cover California and the counties of Josephine, Jackson and Klamath in Oregon. The company has recently appointed Horace E. Trumbull as advertising manager. Mr. Trumbull was formerly advertising manager of the SKF Ball Bearing Company of Hartford, Conn.

Wheeler Condenser & Engineering Company, Carteret, N. J., announces that it has obtained from the Schutte & Koerting Company of Philadelphia, Pa., through the Allen Property Custodian, the exclusive right to manufacture and sell steam jet air pumps under Patent No. 868,928 in connection with surface condensers, jet condensers, barometric condensers, vacuum pans and evaporating apparatus. This patent covers the valuable feature of two or more steam jets working in series with a condenser between the jets.

National Railway Appliance Company, New York, N. Y., has elected A. C. Delaney, president, announces the election of Fred C. J. Dell to the office of secretary of the company, effective Dec. 24, 1918. Mr. Dell has acted in the capacity of president's secretary of the company for the past two years, previous to which time he was connected with the American Electric Railway Manufacturers' Association as assistant to the secretary-treasurer, a position which he held from March, 1911, to August, 1916. In the latter year he resigned to assume charge of the detail work of the exhibit committee for the 1916 convention of the American Electric Railway Association, and in October, 1916, he was elected to the office of secretary of the American Electric Railway Manufacturers' Association, which position he still holds. Mr. Dell received his early training in the office of the vice-president and general manager of the Interborough Rapid Transit Company, where he was employed in a clerical capacity for a period of seven years under Vice-President Frank Hedley.

New Advertising Literature

Truscon Steel Company, Youngstown, Ohio, Pressed Steel Department: Folder of pressed steel.

Walter A. Zelnicker Supply Company, St. Louis, Mo., Bulletin No. 250, or that for January, 1919. It contains eighty-four pages.