

# Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

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## Feel an Individual Responsibility for the Victory Loan

EVERYONE was happy on Nov. 11 last, when the armistice was declared. The war was over and the principles for which we entered it were safe. But the signing of the armistice did not end our part in the conflict for liberty. The success of the Victory Loan is the most immediate duty which remains. We must see it through, and this can be done only if each person responds so far as he, or she, can, as with the preceding loans. It is this appeal of Liberty to the country to keep the faith, which is pictured in our colored insert of this week. We must make certain that the fruits of victory are not only won but kept, and this can be done only by strengthening our national treasury, by stimulating business, by placing our utilities on a firm foundation and by co-operative effort in all directions by which this country may recoup through industry and thrift the losses which it suffered through the war.

Do you wonder why we mention all these points together? Simply because national prosperity demands not only that the Victory Loan be taken up, but even more that it get without delay into the proper hands. The loan will not benefit the country to the highest degree, unless the bonds are widely distributed in the hands of the public. The banks must not be expected to provide all the funds.

The member banks of the Federal Reserve System alone had at the end of 1918 more than 20 per cent of their total loans and investments (exclusive of fixed investments) tied up in United States war paper. The amount of such paper, of course, has a direct effect upon the current rates of interest for commercial loans. Hence, if the banks are to finance at reasonable rates the public utilities and the scores of other businesses which urgently need development, the public should not compel the bankers to tie up several billions more in government securities.

Through the co-operation of the banks, their depositors and the general public can take the greater part of the Victory Loan and pay for it out of a year's income. Such assistance the banks can and will gladly give, but the public must do the rest. Help restore the nation's prosperity while paying its bills.

## Brighten Up the Shop Grounds With a Bit of Color

MEN who work in the electric railway shop or power house are just as human as those who work in starched linen and spend their time in swivel office chairs. Being human they like flowers and will work better when they associate their work with the attractiveness of a garden, large or small as the circumstances permit. This fact needs no argument. Why is not more done in a practical way to exemplify it?

In last week's issue of this paper a short article was printed giving some detail of what the Schenectady Railway is doing to beautify the plots on which its substations are situated. This work is the result of the conviction and persistence primarily of one man, but the whole organization is pleased to co-operate with him and all are proud of the result. Here then is the first requisite—some one who will make it his job to put a planting scheme across. A volunteer, in general, will get the best results. The second thing is to have a plan, which might well be prepared in co-operation with all the flower lovers available. When such a plan is made well ahead of requirement, the plants cost little. Finally, persistence in caring for the plants must be insisted on. Plants are sensitive to care; they respond marvelously to intelligent attention.

Let's make the waste spaces around the railway buildings blossom this year as a sign of gratitude for victory and peace, if for no other reason!

## Are There Any Mitigations to a Receivership?

AS RECEIVERSHIPS are becoming more common among electric railways it is worth while to consider whether there is any bright side to such a condition. In the first place, a company which goes into the hands of a receiver is at least freed from that mocking phrase: "The worst is yet to come." When the courts take charge the crisis has arrived. The public is brought up with a sharp turn to a realization of the fact that the railway's cries of "Wolf, wolf" were true after all; stockholders begin to see that loss of their equity is worse than postponement of dividends, and employees are sobered by the prospect of a reduction in staff if not the disbanding of the force and the dismembering and sale of the property.

The receiver comes to his task armed with powers vastly in excess of those possessed by the most able and courageous manager. He is armed to cut through prejudice, politics and precedent instead of going around them or of standing at bay among a host of conflicting interests. He can postpone a thousand and one litigations if it appears that the money can be spent otherwise to better immediate advantage.

One would expect that a receiver would retain the local executive as his right arm. Yet this is not always the case, although that fact is not necessarily a reflection upon the manager retired. It is his misfortune not his fault if he has been obliged to act against his personal judgment in refraining from giving more service or carrying out other reforms. Likely enough when the receiver arrives he will find that the manager long became discouraged in making suggestions to an obdurate board of directors. As a result, the local public will not have the necessary faith in his promises even under

a receivership, unless backed up or inaugurated by other men who come well recommended.

This accounts for the rise of the electric railway expert or consultant. He is the specialist where the local manager is the family physician. He comes to the task equipped with experience in handling certain types of railway disease among a large number of patients. Like the receiver, he is not bound by local conditions nor has he been so close to the daily detail drudgery that he cannot see the possibilities of economy in cost or of increase in traffic. The greatest traction expert in the world would soon lose his usefulness. If within five minutes he had to advise a foreman how to wire some lamps and then confer with a banker over the telephone on the meaning of a million-dollar wage increase! Therefore, a wise receiver will not only secure the benefit of specialists but will insist that the executive of the recovered property be given powers that will permit him to leave the smaller things to smaller men.

### Keeping the Mind Focused on Transportation Fundamentals

NEVER in the history of the electric railway industry have there been so many plans for improving electric railway service and putting the whole business on a more rational basis than at present. Scheme follows scheme with such rapidity that unless the few fundamentals are held clearly in mind confusion is apt to result. These fundamentals are that the public desires to be transported with the greatest possible frequency and speed, in comfort and safety, and at a reasonable cost. As a standard in determining these things it will use a combined picture of all other available means of transportation. Many times undoubtedly this standard, which will vary somewhat in the minds of different individuals, will be set higher than it is possible for the electric railway to attain. It is then obviously the duty of the electric railway, while endeavoring to meet the highest ideals of service, to explain the real situation to the public. While the explanation is being given, every effort will naturally be made in the line of reducing headway, increasing schedule speeds, providing more comfortable and more sanitary cars, operating these cars more smoothly and at the same time keeping operating costs at a minimum. These things being done it will be possible in the long run to prove the case of the railways for a reasonable rate of return on its investment of money and effort.

Of course, where the fares are inadequate, it is impossible for a railway to do as much in the way of improving its service as it would like. Nevertheless, there are certain directions in which it can work which will be of benefit both to the public and itself. Thus, changes in the direction of shorter headway of cars will encourage people to ride who otherwise would walk, will reduce loading time because fewer people board each car, will help to keep tracks clear of conflicting traffic because drivers of vehicles realize more clearly that the tracks are primarily for the railway, etc. Higher speed permits the same service to be given with fewer cars or more service with the same cars. Higher speed is the result of various factors, including efficient use of well-selected equipment which in turn tends to economy in energy, and elimination of unnecessary stops, which again results in energy economy, etc. Attention to the comfort of passengers attracts business because the well-ventilated, well-seated car affords rest to the pas-

senger as well as transportation. Application of safety principles is reflected in the accident claims account, a possible source of very great financial saving and of improvement in public relations.

Almost any railway can afford to go to considerable length in the directions mentioned without exhausting the possibilities of giving better service at less net cost, considering cost in the broad sense with due regard to the purchasing value of the dollar.

### The Public Suffers When Justice to Utilities Is Denied

WHEN will the public learn that it is really concerned with the financial conditions of public utility corporations? When will it cast aside its cloak of indifference and cease to make light of the troubles of these companies with the typical American remark of "We should worry?" F. H. Sisson of the Guaranty Trust Company of New York put this situation very clearly in an address, abstracted last week, when he showed that direct interest in the welfare of such corporations is not limited to those who are stockholders in the companies, because the solvency of many banks and insurance companies—which means millions of individuals—is dependent on the protection given to public utility securities which are included in their assets.

One is naturally forced to reflect seriously on this situation when hearing of financial disaster overtaking the great transportation agencies of the country. The latest big company to be added to this list is the United Railways of St. Louis. This corporation, with an investment of more than \$100,000,000 in road and equipment, passed into the hands of a receiver last week after a hard struggle to meet expenses with a 6-cent fare.

It is possible to dwell at length on the conditions which brought about this calamity, but the story has now become an old one. We think a better lesson can be learned from considering the prospects confronting the industry as a whole. No one property need be taken as an example, because with few exceptions a similar lesson is impending in all the larger cities. This being true, it is no cause for wonder that the people do not grasp readily at opportunity for municipal ownership. The voters of Detroit doubtless had this in mind when they refused to sanction the taking over of the local transportation system even at a reduced purchase price.

The authorities of St. Louis had a chance about a year ago to make a fair settlement for renewal of the railway franchise, but after long months of bickering the best offer they could agree upon fell short of meeting the basis which would be accepted by the security owners. In Chicago, too, the people had an opportunity not long ago to approve an ordinance which would have assured improved transportation at actual cost. They rejected the compromise terms, and while the company still has some eight years of life under the present agreement the people are not getting the service which would have been made possible on the other basis. Instead, we understand that a certain political element has started to cloud the real issue by suggesting the advisability of building a separate rapid transit system to be paid for out of the city's traction fund. The prospect sounds attractive, but as usual the important fact is being held back from the public that a separate system means a separate fare and that the existing

rapid transit lines cannot be forced into an arrangement which would give the advantages of unified service. In New York, in a similar way, the receivership of the surface lines naturally suggests a segregation of the underlying properties with a new fare every time a passenger changes to a different line. This would be one way of effecting an increase in fare, though perhaps an inconvenient one to the public. If the issue of universal transfers was an obligation of the consolidated company, the insolvency and dissolution of the company removes that obligation. Any enforced extension of the transfer system then to the underlying companies is a burden added to their original charters, for which they should receive compensation.

The moral in the several cases cited above is the same. It means that co-operation is needed in order to get the best results. Both parties to these disputes can get along for a time without a harmonious settlement, but in the end—for the benefit of the public as well as the companies—all will have to do what should have been done years ago, namely, bury all prejudice and get together for the common good.

### No One Can Really Desire to Lose His Hundred Rides

THE frightened bather who suddenly finds himself carried beyond his depth is not likely to be overjoyed to hear a voice from the shore yelling: "The danger began five minutes ago when you were 20 yd. out, and it has been getting 20 per cent greater every minute." In such a crisis the bather wants a lifesaver rather than statistics.

In the present critical electric railway situation such may well be the frame of mind of many a company in regard to an analysis of the 1917 statistics just compiled by the Bureau of the Census. These statistics will not of themselves save the railways from destruction. Nevertheless, they are capable of performing invaluable service along two lines—they can prove to the public that the railways should not be blamed for their present lamentable position, and they can emphasize the fact that the railways are worth saving. Consequently we would direct particular attention to the preliminary census figures for the period 1907-1917 reproduced elsewhere in this week.

During this decade the electric railways of the United States did their best to make both ends meet. The industry grew, to be sure, but its income advanced at a declining rate and its expenses rose at a greater and an increasing rate. Of the \$300,353,786 or 69.9 per cent gain in income from all sources for the decade, \$156,186,263 arose in the first five years, but of the \$201,285,402 or 80.1 per cent advance in operating expenses \$119,698,298 came in the second five years. The operating ratio in 1917 at 63.7 per cent was considerably greater than that of 58.7 per cent in 1912, and it even ran higher than that of 60.1 per cent in the first year of the decade.

The miles of single track gained only 3746 or 6.9 per cent in the second half of the decade as compared to 6683 or 19.1 per cent in the first half, and the passenger cars only 3752 or 4.9 per cent as compared to 6146 or 8.8 per cent. This restricted expansion of the industry was but the inevitable result of its lessened earning power, but still the industry was trying to do its full duty to the general public. It succeeded in largely checking the great increase in free riders of

the first five years, although the transfer traffic advanced more rapidly and for the decade kept pace in rate of increase with the revenue traffic. Moreover, the industry increased its output of revenue car-miles at a greater rate in the second five years than the cars and the number of employees, in spite of the considerably greater increase of expenses over these items and over income as well.

The detailed statistics in general speak for themselves, but two individual items may well be mentioned. Owing to differences in the accounting classifications a strictly comparable figure for taxes is not presented, but, as explained elsewhere, the minimum increase over 1912 was \$10,728,730 or 30.7 per cent. The other item is wages. That the present heavy wage burden had its beginnings some time ago is indicated by the fact that from 1907 to 1917 the salaries and wages increased more than twice as rapidly as the number of employees, and from 1912 to 1917 more than six times as rapidly. And this in an industry where during the decade the salaries and wages have averaged about 60 per cent of the operating expenses!

What will the next census show? One would dread to think of it were he not confident that the public must see the vital necessity of giving adequate support to the electric lines. More than eleven billion revenue passengers in 1917—such a figure may not mean much to a public which is now much bored by war figures less than trillions. But here is a simple figure which tells a great story—electric railways in 1917 provided 100 trips for every man, woman and child in the United States. What other public industry comes closer to the daily life of each individual, or has had a more-beneficial effect upon community life and prosperity? The electric lines must be preserved.

### Courtesy by Employees Pays Both Company and Man

SEVERAL times recently we have advocated editorially the importance of utilizing employees' co-operation in promoting general good-will. We have been trying to convince railway men that they may be overlooking their best publicity medium in failing to use the platform employees to spread information about the company and to create a favorable public opinion.

And now comes a news item from Chicago to the effect that one of the older conductors on the Surface Lines, familiarly known as "Mike," and beloved for his courtesy, had died. The point of the story which interested us was that by his politeness and kindness he won the affection of hundreds of men, women and children passengers and that a large floral offering from these friends was conspicuous at the funeral. It was related in the daily press that on a rainy day he was known to signal for his motorman to stop the car in places where there was no mud or water, so that the dresses of the women would not be soiled.

What a wonderful place for making friends for the company is the platform of the car! What a force in the community would be the public utility company which could boast that a large percentage of employees were men who were popular with their patrons! It is not impossible to achieve this result, and the executive who can surround himself with a loyal force of employees, actively at work for the good of the management, need have no worries about the final outcome in matters in which popular favor counts for much.

# The Zone Fare in Practice

## ABERDEEN

The Combination of Zone and Universal Fare Used in This City of 165,000 Stimulates Both Short-Haul and Long-Haul Riding— Why an Average of More Than Eighteen Passengers per Car-Mile Has Been Obtained in a City Built Up Along American Lines of Housing

By WALTER JACKSON

THE visitor to Aberdeen who expects to find either cold or fog in winter because of its extreme northerly location is pleasantly surprised at the mildness of its January days in comparison to British cities much further south. Nor is the first good impression of Aberdeen spoilt by its appearance, for its immaculate cleanliness and its buildings of the famous Aberdeen silver-gray granite justly entitle it to the name of "The Silver City by the Sea."

Like other old cities, Aberdeen is full of antiquities, some desirable and others undesirable. Among the latter class are the ancient granite tenements or flats in the older part of the city from which many of the inhabitants cannot be tempted any more readily than a New York apartment dweller can be induced to set up a residence in Brooklyn or New Jersey, far from the Great White Way! There seems to be general agreement among the officials interviewed that Scotsmen are much less inclined to seek the isolation of a

cottage than Englishmen. Whether this is so or not, it is clear that quite a number of Aberdonians prefer cramped quarters if they can only be near the

center of the city's activities. A proof of this is afforded by the view at the head of this article, showing "The Shiprow" which is within a couple of minutes' walk from the Municipal Building visible in the background. Since this photograph was taken, one side of the street has been cleared away as a step in the municipality's housing program, but the building on the opposite side still has its full complement of tenants. G. M. Fraser, city librarian, who kindly loaned this view from his collection, said: "The only way you can get some of these people out is to shell them out."

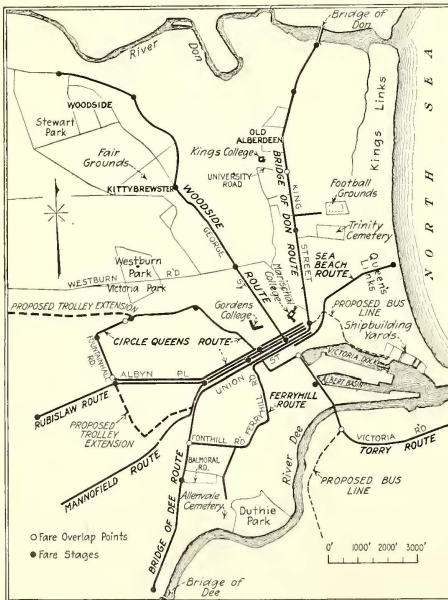
About fifty years ago Aberdeen took the first great step in its modernization when it widened Union Street. This is a magnificent thoroughfare about 1 mile long and easily wide enough for four tracks should they be needed. It is so wide that other vehicles keep off of the car tracks, so that it is the regular thing for motomen to make up time when they reach the principal street downtown—which is surely a novelty! It would have been well for Aberdeen if it had several Union Streets, but most of the old circuitous and narrow lanes downtown have remained to this day to such a degree that only a single track can be laid on some streets and loops are out of the question. Even where there is room, as at Castle Street, the foot of Union Street, a loop is not permitted as this would interfere with the weekly market. Thus at the very center of the city's car service, the cars must be turned back on the four tracks by means of cross-overs. It would seem from this that not privately-owned street railways alone are encumbered by tradition.

The Corporation of Aberdeen began to clear out some of its slums as long ago as 1883 by pulling down the old buildings and then leasing the land for the erection of private business buildings. Later, in accordance with the housing of working class act of 1890, it acquired 2½ acres of vacant ground on which it erected workmen's flats as follows:

Urquhart Road, eight buildings with nine tenants each.....	72
Park Road, four buildings with nine tenants each.....	36
Roslin Street, two buildings with twelve tenants each.....	24
Total tenants.....	132



THE SHIPROW, AN ABERDEEN SLUM STREET AS IT APPEARED BEFORE THE DEMOLITION OF ONE SIDE



MAP OF ABERDEEN, SHOWING PRESENT ROUTES AND PROPOSED CAR AND BUS EXTENSIONS—ALSO FARE STAGES, OVERLAPS, ETC.

As in the case of other British cities, the war has made the problem of future additional housing most acute, for private building is made commercially impossible by the rise in labor and materials. Municipal and State subvention of some kind has therefore become a certainty. In Aberdeen alone it is expected that 1500 buildings of various types will have to be built under governmental auspices during the next five years, merely to meet the shortage of buildings rather than to replace existing structures.

However, the younger sections of the Aberdeen of to-day are as close to American ways as can probably be found anywhere in Great Britain. There are blocks and blocks of one-family and two-family houses very similar in the up-to-dateness of their fittings to American homes. Mingled with these are blocks of six-family houses—the favorite size of flat. Aberdeen has plenty of room for cottages, but many people prefer or have to live in the flats because they get more value for the money. For example, a certain class of apartment can be rented for from \$60 to \$70 per annum. Like accommodation in a cottage would cost \$95 to \$100 per annum. Therefore, it is not astonishing to

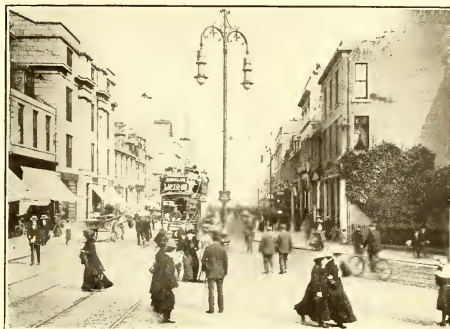
of a mile. Such service for a great part of the day, plus the half-penny short-distance rate, induces the man in a hurry to take the first car that will take him anywhere near his destination. In any event, walking along Union Street is reduced to a minimum.

The Bridges, or River Dee to River Don, route is the only through line at present. The others are turned back at Castle Street, owing to the different riding characteristics on opposite sides of the town which, of course, would result in unbalanced travel. An exception to this would be the conversion of the Torry and Woodside lines into a through route. This will probably come under consideration in connection with the widening of Market and St. Nicholas Streets. It is expected that this second through line would have continuously good travel between the paper and woolen mill section at the Woodside end and the shipyards and great fish establishments at the Torry end.

Because of the heavy intermediate short-haul travel, there is little need to economize mileage through turn-backs. At present cars are turned back at only one point, and the chief reason for this is car shortage. In discussing this aspect of operation, William Forbes,



A SCENE ON UNION STREET, ABERDEEN, SHOWING THAT THE BICYCLE IS NO MEAN COMPETITOR OF THE STREET RAILWAY



SCENE AT A CAR STOP, SHOWING SHIELD (WHITE LETTERING ON A RED SHIELD) ON A MUNICIPAL LIGHTING POLE

find flats in the suburban sections to such an extent that certain areas carry restrictions against the building of tenements.

With regard to the whole question of the construction of cottages in the suburbs, it has been observed that it is not the poorer-paid workmen but the higher-paid mechanics or business men who are most desirous to live in them. The laborer may prefer to stay further in town because of his longer working hours and because food is usually a little cheaper in the center of the city than in the suburbs. Therefore, the matter of rate of fare is relatively unimportant. In Aberdeen, this contention is particularly true as will be seen from the fare schedule presented later.

LAYOUT OF THE ROUTES AND SHORT-HEADWAY SERVICE

For its population of 165,000, Aberdeen has approximately 14½ miles of single track, divided among eight routes as shown in Table I.

In addition to the excellent individual headways, four of the routes overlap on Union Street, which means a car every half minute or less for a distance

general manager Aberdeen Corporation Tramways, said that even if the traffic near the ends of the routes was somewhat thinner it was good policy to give through car service in order to discourage walking. The riding habit in Aberdeen, he added, was far from the saturation point. Twenty to thirty cars added to the present peak of eighty-six would prove that.

In accordance with the policy of eliminating the walker; the stops are spaced somewhat closer than is usually the case in Great Britain. The following table shows variations from 390 to 633 ft., and the average for the system as a whole is placed at 471 ft. or slightly more than eleven to the mile. Of course, these

TABLE I—STATISTICS OF THE DIFFERENT ROUTES IN ABERDEEN

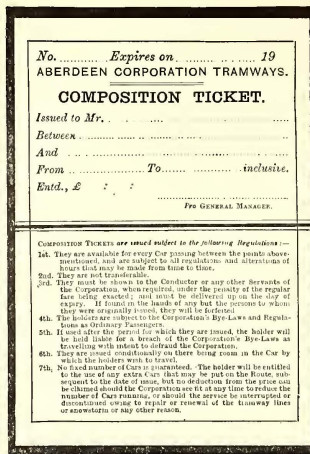
Route	Miles	Headways, Minutes	Feet Between Stops	Passengers per Car-Mile
(1) Woodside	2.4	2 to 6	495	13.4
(2) Circular	3.3	3 to 5	444	14.8
(3) Mannofield	2.1	4 to 7	355	14.1
(4) Bridges	4.1	5 to 7½	525	14.9
(5) Rubislaw	1.9	6 to 10	498	14.0
(6) Ferryhill	1.5	7½ to 10	426	14.6
(7) Torry	1.7	2½ to 7½	390	17.2
(8) Beach	0.9	7½ winter Special in summer	633	19.4

Note—Some of the route mileage is joint mileage.

are only possible, not compulsory, stops. Compulsory stops are those ordered by the inspector of the Board of Trade. They include busy traffic points, but not schools, fire engine stations or the like. About 90 per cent of the stops are made on the near side of intersections, the exceptions being due chiefly to the location of the poles from which the stop signs are carried. Stops are prominently indicated by red signs with white lettering as well as by painting the pole with a striping of red and white. A red shield on similarly-marked poles designates the fare zones.

Several of the waiting rooms at terminals were built jointly for the police and tramways departments. At Dee, the waiting depot includes a refreshment room, the operator of which acts as caretaker. At a number of intermediate stops rustic shelters are provided.

The Aberdeen speed limits for motor cars are 20 m.p.h. and



COMPOSITION (COMMUTATION) TICKET, WORDING PASTED ON INSIDE OF NUMBERED CLOTH BOOKLET, GREEN FOR ADULTS AND RED FOR CHILDREN

multiplied by the city's car-mile operating cost, plus 24 per cent.

The management now has under consideration several additions to the service, of both tramway and omnibus character. Tendency of these extensions is to broaden rather than lengthen the city.

FARE SYSTEM COMBINES ZONE AND UNIVERSAL PLANS

A most interesting feature of the Aberdeen system of fares is that while a single-stage ride may be obtained for a half-penny, all the stages from the center of the city to a terminus cost only 1 penny. It follows that a person living in the suburban territory is situated just as favorably as under American conditions, while at the same time the railway secures short-haul riding that would not come at the higher fare. Nothing could prove the latter statement better than Aberdeen's experience with the Torry line, which serves a work-

<p><b>Al 5840</b> CHILDREN (under 12 years of age)</p> <p>Castle Street Aberdeen 1d</p>	<p><b>Fb 7040</b> Ferry Boat</p> <p>1d</p>	<p><b>Nd 1216</b> Sailors and Soldiers in Uniform</p> <p>1d</p>	<p><b>Xb 6067</b> Bridges of Don</p> <p>1d</p>	<p><b>EO 6439</b> CHILDREN'S 1<sup>st</sup> TICKET. 2</p> <p>Under Twelve Years of Age</p> <p>Aberdeen Corporation</p>	<p><b>Eb 8966</b> KING'S GATE</p> <p>1d</p>	<p><b>Iv 3497</b> Bridges of Don</p> <p>1d</p>	<p><b>Df 3836</b> Bridges of Don</p> <p>1d</p>
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SPECIMENS OF ABERDEEN FARE RECEIPTS

for street cars 14 m.p.h. The schedule speed of the cars for the entire system is 7.6 m.p.h. There are no traffic rules to prevent automobile parking, but offending vehicles can be removed at the discretion of the policeman. The traffic policemen always give preference to street car traffic where blockades are concerned.

Although some of the streets downtown are so narrow as to permit only one track, there is no one-way operation of either cars or general vehicles. No block signals are used for cars running over these single-track sections. The motormen depend upon their time-points and upon seeing the upper-deck headlight which shows the color used to identify a given line. This scheme has worked satisfactorily to date despite the fact that cars in each direction have to be operated at intervals of two minutes. The longest single-track section of this kind is 850 ft.

The 14½ miles of track (measured as single track) previously mentioned is all that the city has. However, some additional service is due to the fact that the Aberdeen Suburban Tramways, a privately-owned company, runs over the municipality's tracks. The Suburban cars while within the city limits handle all local business as a city car. For this service the city pays the Suburban Tramways a sum equal to the mileage

ing-class-district. When the only fare on this line was 1 penny, it earned just 9d. (18 cents) per car-mile and was the lowest of all. Five years ago the 1d. fare was instituted whereupon the traffic more than doubled, and the earnings rose to 17.2d. (34.4 cents) per car-mile. Instead of a seven and one-half minute service, cars are run every two and one-half minutes the greater part of the day! On some days the limitations imposed by a single track on part of the route actually make it impossible to handle all of the service offered.

In addition to the 1d. short-ride minimum fare for the adult rider, the Tramways have two other tickets of this denomination, as follows: Children's tickets, for ages from two to twelve years inclusive, good for the usual penny distance; sailors' and soldiers' tickets (since Aug. 20, 1917). The penny tickets, as already noted, are good for a full ride from the center of the city to the terminus of the line. If, however, a passenger on the Bridge of Dee-Bridge of Don through line wishes to ride from terminal to terminal, his fare would reach the maximum of 2d. In other words, the penny full-route fare does not apply to maximum cross-town rides. Furthermore, a passenger on the Circle Queen's line would not be permitted to loop around for a single penny fare, as the terminus of this route, from the fare standpoint, is at its mid point, as in-

licated. A sightseer, therefore, who wanted to go all the way around would have to pay 2d. There is another condition where the fare could exceed the normal penny charge, namely, in the case of turnbacks. Thus, on the Woodside route it is customary to turn back some cars at Kittybrewster. If through passengers boarded the Kittybrewster car they would expect a free transfer to the following through car. To avoid this possibility, the tickets are punched to Kittybrewster and it is ordered that only the through cars shall carry such riders to the terminus for a penny. If a passenger boards a following car at Kittybrewster he must purchase a new ticket.

KINDS OF FARES AND ROUTE EARNINGS

As it is not desirable to discourage short-haul cross-town riders, a few overlaps have been established. One of these allows a penny ride from King's College (University Road) to Ferryhill (Fonhill Road), as indicated by the parallel lines on the map. The other overlaps, similarly indicated, are of minor importance. Overlaps are used as little as possible since they tend to confuse

tended for the lost time on production of a doctor's certificate! The composition ticket is especially popular on the Mannofield line where about one-fifth of the riders are commuters. Roughly, the full adult rate is 12s. 6d. (\$3.00) for the first 2100 ft. and 6d. (12 cents) for every additional 300 ft.

The several classes of tickets referred to are shown in the accompanying group. The children's ticket of the 6400 series is the one used for the straightaway ride from the center of the city to a terminus while that of the 5800 series is used in case of overlaps. It will further be noted that the 1d. and 2d. tickets do not show as many stages as the 3d. ticket. The tramways also sell celluloid tokens at full price in lots of 1s. upward to the postoffice and other employers of messengers.

In view of the extremely moderate fares, it is interesting to observe the high car-mile earnings. Thus, the report for the year ending May 31, 1918, shows the results given in Table II.

Even these excellent figures will be exceeded during the present fiscal year, Mr. Forbes' estimate being 45,-



AN EXAMPLE OF ABERDEEN'S CUSTOMARY FLAT—THE SIX-FAMILY HOUSE



ABERDEEN HAS THOUSANDS OF THESE COMFORTABLE ONE-FAMILY HOUSES

the conductor, and with a half-penny base fare there is little need for their establishment.

Before passing on to the statistics showing the classifications of passengers according to fares paid, note should be made of what is locally termed a "composition" ticket. This is a non-transferable commutation ticket of such long-established popularity that the public would strenuously protest if it were withdrawn. Such tickets, good for periods of three months, are sold for as low as 13s. (\$3.12 up to 21s. 9d. (\$5.22)). Children's tickets are sold at half price. Should the holder of a ticket be unable to use it because of illness during the entire quarter, he can have the ticket ex-

ceeded 000,000 passengers and a revenue of £140,000. The figures given in Table III cover the thirty-three weeks from June 1, 1918, to Jan. 23, 1919.

The high earnings per car-mile of the Beach line are to be attributed to the fact that the adult fare on this pleasure route is 1d. for any distance whereas the line is only 0.9 mile long. It is rightly held that people on pleasure bent should not begrudge paying a slightly higher fare on a line that has heavy travel only two or three months in the year. Individual half-penny stages are shown in Table II. The average half-penny stage for the entire system is about 0.6 mile, the average penny stage or center to terminus ride, 1.9 miles, while the single 2d. ride is 3.7 miles.

TABLE II—PASSENGERS AND RECEIPTS PER CAR-MILE FOR YEAR ENDED MAY 31, 1918

Route	Passengers	Average 1 d. Stage, Ft.	Passengers per Car-Mile	Receipts per Car-Mile in Cents
Woodside.....	6,955,248	3,192	13.4	25.7
Circular.....	6,192,348	3,105	14.8	25.5
Mannofield.....	4,617,138	3,390	14.1	25.6
Bridges (Dee to Don Rivers).....	6,381,839	3,495	14.9	25.4
Rubislaw.....	2,259,088	2,919	14.0	24.5
Ferryhill.....	1,604,496	3,264	14.6	23.4
Torry.....	3,724,532	3,000	17.2	24.0
Beach.....	1,004,839	.....	19.4	34.9
Total.....	32,739,528	Average	15.06	Average 25.4

\* Exclusive of commutation or composition tickets.

TABLE III—PASSENGERS AND RECEIPTS PER CAR-MILE FOR THIRTY-THREE WEEKS ENDED JAN. 22, 1919

Route	Number of Passengers Carried	Passengers per Car-Mile	Receipts per Car-Mile (in Cents)
Woodside.....	5,593,408	18.3	29.4
Circular.....	5,079,386	18.5	29.6
Mannofield.....	3,811,306	14.5	24.8
Bridges.....	5,217,311	18.7	30.0
Rubislaw.....	1,776,369	17.2	27.6
Ferryhill.....	1,321,294	18.5	28.6
Torry.....	3,267,154	20.8	28.2
Beach.....	922,123	24.8	42.6
Total.....	27,088,351	Average 18.2	Average 30.1

		DAY <i>Saturday</i>												DATE <i>4th Jan 1919</i>																					
ROUTE	CONDUCTOR	Dist No.	Car No.	Children's Tickets				Soldiers and Sailors				Id.				Id.				Id.				Id.				Id.							
				Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.	Con. No.							
CIRCULAR	<i>A. McFarlane</i>	1	31	147	1508	171	78	706	101	87	1032	1078	105	278	176	91					1226	1179	257	1202	1217	224	558	2041	723	52					
	<i>A. McFarlane</i>	5	31	2312	2476	123	110	210	70	3779	1081	126	646	1014	139					2110	1576	66	1997	1649	266	1660	2311	176	1250						
	<i>A. McFarlane</i>	3	33	273	2876	106	100	210	60	1076	1112	104	142	170	71					1678	1597	227	1640	170	678	2023	676	811	2023	2700					
TOTALS FOR THE DAY				3025				1766				2899				3213				2638				9874				1929				7			
TOTALS FOR PREVIOUS DAYS				501700				180720				492931				577114				629123				1622119				306258				46923			
TOTALS TO DATE				805325				487486				779822				854227				898246				1634233				306857				4700			

CONDUCTOR'S WATTBILL FOR DAY COMPLETE WITH RECORD OF ALL CLASSES OF TICKETS, TOTAL

For the fiscal year ending May 31, 1918, the traffic according to classification of tickets, except composition, was as given in Table IV.

TABLE IV—NUMBER AND CLASSIFICATION OF TICKETS SOLD, YEAR ENDED MAY 31, 1918

Description	Number Sold	Percentage	Value Per Cent
Children's tickets	3,365,932	11.17	6.99
Soldiers' and sailors'	1,456,205	4.41	2.95
Id. ordinary	19,337,295	59.12	15.69
2d. ordinary	53,935	0.14	0.40
Total	32,739,528	100.00	100.00

A striking feature is the large number of children's tickets sold. An Aberdonian youngster would rather spend his half-penny for a ride than anything else. With no change in fares, the total travel increased from 27,141,275 for the fiscal year ending May 31, 1917, to 32,739,528 for the fiscal year ending May 31, 1918. This raised the number of rides per inhabitant per

annum to 229. The income increased from £100,073 to £116,397; operating expenses increased from £36,047 to £39,400, while fixed charges, depreciation, renewals, etc., decreased from £27,283 to £27,188. So far, Aberdeen's careful management and intensive cultivation of the riding habit have made it unnecessary to increase fares. However, the increase in labor charges has been particularly heavy, and no one can predict what will happen if the upward trend continues. With reasonably good fortune, on the other hand, Aberdeen will be able to write off the rest of its investment charges within three or four years.

FARE COLLECTION AND AUDITING

It is an interesting fact that for several years prior to 1916, the Aberdeen Corporation Tramways used the prepayment system of fare collection. From an operating standpoint prepayment was satisfactory, but some of the passengers continued to agitate for the old way

**ABERDEEN Corporation Tramways.**

# TABLE OF FARES

ROUTE	STAGES	CHARGE
WOODSIDE	Castle Street and Green Street	1/2
WOODSIDE	1) Northside Street and Redfern Street 2) Redfern Street and Collier Road	1/2
RUBISLAW	Rubislaw Junction and Queen's Cross	1/2
CIRCULAR	Robb's Junction and Queen's Cross Queen's Cross and St. Nicholas Street Robb's Junction and Protestant Place	1/2
MANFIELD	Castle Street and Green Street Green Street and Collier Road Collier Road and Terrace	1/2
FERRYHILL	Robb's Junction and Redfern Road Redfern Road and Terrace	1/2
TORRY	Robb's Junction and Collier Road Collier Road and Terrace	1/2
BEACH	Market Street and Bathing Station	1/2
TORRY	Union Street and St. Fittick's Road	1/2
WOODSIDE	St. Nicholas Street and Woodside	1/2
RUBISLAW	Castle Street and Rubislaw	1/2
CIRCULAR	Castle Street and King's Gate (via Rosemount) Castle Street and King's Gate (via Albany Place) Man Accord Street and Skene Terrace	1/2
MANFIELD	Castle Street and Manfield	1/2
BRIDGES	Bridge of Don and Market Street Fountainhead Road and District Road Market Street and Bridge of Don	2/2
FERRYHILL	Castle Street and Harbour Road Castle Street and Whitehill Road (South End)	2/2
BRIDGES	Bridge of Don to Bridge of Don	2/2
CIRCULAR	Castle Street (Circle either way) to Castle Street	2/2

Children under 2 years of age, free. Children over 2 years and under 12 years, 1d. for any penny distance. All passages with the exception of children's tickets for any distance on any one car 2d. Personal luggage over 20 lbs. to exempt for any distance on any one car 2d.

**PARCELS DELIVERY SERVICE.**  
Hand your Parcels to any Conductor to be Delivered.  
**CHARGE 2d. ANY DISTANCE.**

PARCELS up to 14 lbs. in weight will be received by Conductors for delivery by Tramway Messengers to any distance within 100-yards of the Corporation Tramway Track for the charge of 2d.

**NUMBER 45**

1 White

Date into Bus.	Con.	Clas.	Issued.	Date into Bus.	Con.	Clas.	Issued.	Date into Bus.
1909 Pr				19				
1909 0000 0000 1000 0000				1909 1909 1000				
2000 2000 1000				3000 3000 1000				
4000 4000 1000								

INDIVIDUAL TICKET BOX RECORD OF TICKETS HELD FOR A GIVEN CONDUCTOR

**ABERDEEN CORPORATION TRAMWAYS.**

**REQUISITION FOR TICKETS.**

ROUTE	DESCRIPTION	DATE	Next No. Wanted	Quantity.
WOODSIDE	2 1/2 blackens	8 Jan 1919	0000	500
	1 White		0000	1000

ISSUED BY: \_\_\_\_\_ CONDUCTOR: *[Signature]*

ENTERED BY: \_\_\_\_\_

CONDUCTOR'S REQUISITION FOR TICKETS



STATE OF WEATHER *Del* TEMP. SPECIAL EVENTS

Parola			Parcel Delivery - 2d			Total Passengers			Amount Recd.			Cash Received			Tickets Received			Other			Shorts			Sundry Receipts			Total Receipts			Punch			Total Missed			Revenue		
Car No.	Ch. No.	Rate	Car No.	Ch. No.	Rate	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d			
601			2			12.35	4	3	5 1/2	44	2	7 1/2																										
426			76	78	76.75	12.91	4	4	2 1/2	44	2	7 1/2																										
427			0			11.45	3	1	5 1/2	43	2	7 1/2																										
6			6			26.57	8	9	2 1/2	45	3	3 1/2																										
215.0			5	6	2	19.55	4	1	5 1/2	44	2	7 1/2																										
215.6			5	6	2	19.55	4	1	5 1/2	44	2	7 1/2																										

REVENUES, NUMBER OF PASSENGERS. NOTATION CONCERNING TICKETS WORKED OUT OF ORDER, ETC.

until their wishes were met by the municipality. Hence, the present method of fare collection is the customary one of getting the money within the car and giving a receipt for the fare paid. Operating conditions are not severe enough to call for loading in queues, but at the busy city terminals and shipyards it is customary for the conductress to collect the fares on the lower deck when the car is loading; otherwise it would not be possible to get all the money on a car which seats twenty-four below, thirty upstairs and has no limit on standees. The platforms are wide enough to allow two passengers to board at one time, so that it is not uncommon to fill up a car in a minute.

As there are no 1 1/2d. or other odd fares, the ratio of passengers who have exactly the right amount of copper runs up to 80 per cent. The conductress starts the day with 5s. 6d. in change, and it is customary for her to keep the half pennies in a separate pocket for greater convenience in making change for pennies. Otherwise she carries the usual outfit of ticket holders, money bag and punch. The last-named is the William-son ticket punch made at Ashton-under-Lyne. It is of the standard type with registering count of every ticket punched, a compartment for the punchings and a bell signal. The Aberdeen Corporation Tramways bought these punches outright instead of paying an annual rental.

To check the proper collection of fares and to see that each passenger has the correct receipt and is not over-riding, the Tramways employ four ticket inspectors in shifts of two each as compared with 130 conductresses and nine conductors. The inspectors' shifts are so arranged that all are on duty during the rush

periods. The daily report from a ticket inspector to the general manager gives a record of the routes which he inspected and a record of any missed fares which he noticed and called to the attention of the conductor; passengers per car and other important data may also be included. It is estimated that the loss of revenue from all causes does not exceed 2 per cent. It would not be safe for dishonest passengers to ride beyond their half-penny limit habitually as the conductor would soon learn to spot them. Passengers who refuse to pay may be turned over to the police if they will not give their names and addresses. Where prosecution has been necessary, recalcitrant passengers have been fined up to £3 or nearly £15. Dishonesty in conductors is punished by instant discharge. In general, each car is checked at least twice a day. More frequent inspection would be possible, of course, if the inspectors did not have other duties.

The only other outside supervisory officers are four traffic inspectors and one motorman inspector.

All cash transactions between the conductresses and the receiving department are carried out at the executive offices. When the conductress starts, she makes out a signed requisition for tickets as per the form reproduced. These tickets are taken out of a specific bin containing several thousands of each classification. They are issued from day to day to the conductresses in the order of their serial numbers until the supply is exhausted. In other words, every conductress uses tickets numbered in continuity up to say 10,000, until a new series is begun. If, by chance, she uses a pad out of order, entry of the error is made in a "Tickets out of order" book, but she retains the tickets and issues them the following day instead. A "Ticket discarded" book is also used to keep track of tickets purchased but not used for one reason or another. Such care is necessary since each ticket has a money value. Without going into too great detail, it may be pointed out that from the ordering of the tickets from the printer (Glasgow Numerical Printing Company) to the return of unsold tickets by the conductresses, every ticket is identified exactly, and responsibility fixed from the receiving clerk who gets the tickets from the printer to the general manager who O.K.'s the discarding of tickets used for instruction or other purposes. For example, the tickets reproduced in this article came under the latter heading. Tickets are balanced weekly.

When the conductress receives her tickets at the start of the day's work she also receives her waybill (trip sheet) on which she enters the opening numbers of each kind of ticket supplied. On this waybill she writes in her trip-by-trip terminal times as taken from

WILLIAM FORBES, general manager Aberdeen Corporation Tramways, is no stranger to American electric railway practice. He is not only an assiduous reader of the ELECTRIC RAILWAY JOURNAL but also spent two years in the United States during 1907 and 1908 on the office force of Westinghouse, Church, Kerr & Company, consulting and constructing engineers. Mr. Forbes was born in Aberdeen thirty-six years ago. After completing his school years, he entered the employ of the Caledonian Railway. After eight years of experience on that railroad in all branches of steam railroading he went to America to gain an experience of American business methods which has stood him in good stead in his present post. It was upon his return from the United States that he became traffic superintendent and assistant manager of the Aberdeen Corporation Tramways. He succeeded R. Stuart Pilcher as general manager when Mr. Pilcher was called to Edinburgh early last year to electrify and operate the tramways taken over by the municipality.





DAY		DATE		1d.		1d.		1d.		1d.		1d.		1d.	
CIRCULAR	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

CONDUCTOR'S WAYBILL FOR DAY COMPLETE WITH RECORD OF ALL CLASSES OF TICKETS, TOTAL

For the fiscal year ending May 31, 1918, the traffic according to classification of tickets, except composition, was as given in Table IV.

TABLE IV—NUMBER AND CLASSIFICATION OF TICKETS SOLD, YEAR ENDED MAY 31, 1918

Description	Number Sold	Percentage	Value, Per Cent
Children's tickets	3,365,932	11.17	2.95
Soldiers' and sailors'	1,456,205	4.41	15.69
1d. ordinary	8,227,061	25.16	73.97
1d. ordinary	19,337,295	59.12	73.97
2d. ordinary	53,935	0.14	0.40
Total	32,739,528	100.00	100.00

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ABERDEEN Corporation Tramways.

# TABLE OF FARES

ROUTE	STAGE	CHARGE
UNION STREET	...	1d.
WOODSIDE	...	1d.
BURISLAW	...	1d.
CIRCULAR	...	1d.
MANHOFFIELD	...	1d.
BRIDGES	...	1d.
FERRYHILL	...	1d.
TORRY	...	1d.
SEAR	...	1d.
TORRY	...	1d.
WOODSIDE	...	1d.
BURISLAW	...	1d.
CIRCULAR	...	1d.
MANHOFFIELD	...	1d.
BRIDGES	...	1d.
FERRYHILL	...	1d.
BRIDGES	...	2d.
CIRCULAR	...	2d.

Children under 3 years of age free. Children over 2 years and under 12 years, 1d. for any single distance. All packages with the exception of mineral water for sale stations on any one car. Personal luggage over 25 lbs. in weight for any distance on any one car.

**PARCELS DELIVERY SERVICE.**  
Hand your Parcels to any Conductor to be Delivered.  
CHARGE 2d. ANY DISTANCE.  
PARCELS up to 10 lbs. in weight will be received by Conductors for delivery by Tramway Messengers in any distance within limits of the Corporation Tramway Tracks for the charge of 2d.

TABLE OF FARES POSTED IN ABERDEEN CARS

NUMBER 45

1 white

Date into Box	Com.	Clos.	Issued	Date into Box	Com.	Clos.	Issued	Date into Box
1919. Pr			19					
1000 0999 1000			19					
1000 1999 1000								
2000 2999 1000								
3000 3999 1000								
4000 4999 1000								

INDIVIDUAL TICKET BOX RECORD OF TICKETS HELD FOR A GIVEN CONDUCTOR

ABERDEEN CORPORATION TRAMWAYS.

REQUISITION FOR TICKETS.

ROUTE - Woodside Date - 8 Jan 1919

Dist No.	Description	Serial Letter	Serial No. Wanted	Quantity
45	2 blue and 1 white	AU	0000	500
		B+	0000	1000

ISSUED BY: [Signature] CONDUCTOR

ENTERED BY: [Signature]

CONDUCTOR'S REQUISITION FOR TICKETS

STATE OF WEATHER										TEMP.										SPECIAL EVENTS									
[Detailed weather and temperature data for various locations]																													
REVENUES, NUMBER OF PASSENGERS. NOTATION CONCERNING TICKETS WORKED OUT OF ORDER, ETC.																													

until their wishes were met by the municipality. Hence, the present method of fare collection is the customary one of getting the money within the car and giving a receipt for the fare paid. Operating conditions are not severe enough to call for loading in queues, but at the busy city terminals and shipyards it is customary for the conductress to collect the fares on the lower deck when the car is loading; otherwise it would not be possible to get all the money on a car which seats twenty-four below, thirty upstairs and has no limit on standees. The platforms are wide enough to allow two passengers to board at one time, so that it is not uncommon to fill up a car in a minute. As there are no 1d. or other odd fares, the ratio of passengers who have exactly the right amount of copper runs up to 80 per cent. The conductress starts the day with 5s. 6d. in change, and it is customary for her to keep the half pennies in a separate pocket for greater convenience in making change for pennies. Otherwise she carries the usual outfit of ticket holders, money bag and punch. The last-named is the William-son ticket punch made at Ashton-under-Lyne. It is of the standard type with registering count of every ticket punched, a compartment for the punchings and a bell signal. The Aberdeen Corporation Tramways bought these punches outright instead of paying an annual rental.

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TICKET ROOM STOCK BOOK.																							
Date	No.	Initial	1st				2nd				3rd				4th				Total	Paid	Balance	No. of Tickets	Value
			10	11	12	13	14	15	16	17	18	19	20	21	22	23	24						
<div style="display: flex; justify-content: space-between;"> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> <span>100,000</span> </div>																							

DAILY RECORD OF TICKETS TAKEN OUT OF STOCK

the master time-table which shows the day's work of every car. Then as each half trip is completed she records the top numbers of the tickets left.

The Rubislaw waybill reproduced shows that the conductress began her first shift at 9.58 a.m. at the Castle Street terminus. At the end of her first shift she turned in her waybill and cash except the 5s. 6d. change, to the cashier. The cashier then counted the money and checked the same against the number of tickets sold as indicated by the cashier's personal subtractions. Then the amount due was entered by her in the "office column." Upon this, the conductress was asked to sign the waybill for "Collection No. 1," following which it was returned to her for the next shift. In this case "Collection No. 2" was also turned in at the head office on the last trip downtown. As there are no cash-handling facilities at the car-houses now, the conductress does not turn in until the following day the cash collected on the last night trip up-

SHORT RECEIPT SLIP

Conductor  
Date when Short  
Amount  
Box No.  
Date Paid  
Initials of Clerk

town to the carhouse. She does, however, give up her waybill and tickets to the carhouse foreman who in turn sends them to the receiving department. Hence the conductress before beginning her next day's work must report to the receiving department for the final balancing of tickets and cash. Conductors or conductresses who have early runs do not have to go through this "hangover" process as they complete their day's work before the closing of the offices. As tickets are furnished in continuity from a specific bin for each conductress, the opening numbers on a waybill must correspond to the closing numbers of the preceding day. Every conductress is held absolutely responsible for the correct issue of tickets, and is therefore expected

to see that ticket and waybill numbers check exactly when she takes over the work of another.

Others are given to the Employees' Friendly Society at the end of the fiscal year. As a check upon the efficiency and honesty of the cash clerks and conductresses, a "short receipt" slip is given to the conductress by the cashier. It is obvious where the fault lies if the same conductress receives such slips from all of the cashiers!

Shortages must be paid over at once, but in the event of a dispute where the shortage is large, or where the working of tickets out of order demands time to check

TICKET DISCARDED BOOK.										
Date	From	To	Amount	Description	Value				Why Destroyed	Signature
					£	s	d	¢		
Jan 10	1000	1999	1000	2500	2	11	8	10	for balance	[Signature]
Jan 10	5000	5999	1000	1000	4	10	10	10	for balance	[Signature]

RECORD OF FARE RECEIPTS USED FOR NON-REVENUE PURPOSES

the waybill, the shortage is not paid until the following day after the conductor's opening numbers have been checked with the previous day's closing numbers and the cashier's subtractions have been checked by the journal clerk.

The entire receiving staff is made up of eight women and girls, and these carry out all the functions from the receipt of new tickets to the making out of cash balances day by day. It may be added here that the counting of punchings is rarely if ever found necessary as the punch is an exceedingly accurate machine.

One rather novel feature not directly related to the matter of accounting for fare collections is that while the late conductresses are making their returns, boys are turning the trolley poles for them. Where neces-

ABERDEEN CORPORATION TRAMWAYS.

Conductor, J. MacIntosh Ticket No. 6355  
Motorman, J. Donald Box No. 30

RUBISLAW ROUTE.

Date, Saturday Day, 4th Jan 19 19

Year	Time	Car No.	Children's Tickets				Rubin's Numbers				Imp. for Totals	Castle Street Numbers				Office Column	Collection No. 1.	
			1d	2d	3d	4d	1d	2d	3d	4d		1d	2d	3d	4d			1d
10 14	9.58	68	2264	4443	2128	882	1259	2256	4146	2120	882	1249	3244	1208	2135	1 3 9	Copper 8 2	
10 44	10.28		2275	4449	2143	884	1284	2278	4446	2130	883	1 1278 29	3206	62	10	10	Silver 1-6 3	
11 14	10.58		3296	4489	2154	888	1342	2315	4452	2162	884	1 1324 46	3394	88	4 52	4	Taken .32	
10 14	9.59		2400	4509	2281	940	1848	2404	4511	4 2282	3 941	3 1854	29	4311 42	1208 2135	1 11	Silver .....	
10 44	10.29		2404	4512	2284	944	1871	2407	4513	2 2217	7 945	4 1880 26	4353 42	1208 2135	2 7	2 4	Taken .....	
11 14	10.59							2407	4515	2289	949	1880	4353	1208 2135	2 7	5 7	Silver 2-11-4	
			2407	4512	2289	944	1880	2407	4515	2293	949	1903	4353	1208 2135	2 7	5 7	Taken .....	
			2407	4515	2293	949	1903	2407	4515	2293	949	1903	4353	1208 2135	2 7	5 7	Copper .....	
													1140 Paddington				Silver 2-11-4	
																	5	Taken .....
																		3-14-9
																		8p

sary, relief conductresses are provided and fifteen to thirty minutes' time is allowed for making a final report at the end of the day.

**IMPROVED ROLLING STOCK**

The standard Aberdeen car is of the double-deck type with windshields instead of vestibules. It is 30 ft. long over all including two 6-foot platforms open on the boarding side and with an emergency exit gate (used in prepayment days) on the inner side. The trucks are Brill 21-E with two Westinghouse 25-hp. motors on the earlier cars and GE-200-K 35-hp. motors on the later cars. Hand brakes of the ordinary type are used on most of the cars, but sixteen of more recent construction have been fitted with Peacock brakes which are more popular with the men. The Westinghouse magnetic brake is used only on grades or in other emergency conditions.

Although the seats in the upper deck are of slat, home-made manufacture, those on the lower deck are considerably in advance of the wooden longitudinal seats

hood or canopy on the upper deck to shelter outside passengers against wind and rain. This has proved very popular. The total weight of these cars is 22,400 lb. or 415 lb. per seated passenger.

Satisfied that it could improve upon the type described, the management has recently completed the first of three cars in which upholstered cross seats are used on the lower deck. As shown in an accompanying illustration, double and single seats have been installed owing to the restriction that the space between tracks must be wide enough to permit a person to stand between passing cars without injury. This type of car

Tuesday, Jan. 7, 1919.  
From Inspector F. Murdoch.

To the General Manager,  
Sir—I beg to report:

- Car 77. Checking said car at Loch Street on the journey to town I found one missed penny fare in the saloon from Clifton Road. I informed the conductress and saw she collected same.
- Car 33. Checking this car at Bridge Street while proceeding to Castle Street I found one missed fare in the saloon from Mount Street. I informed the conductress and saw she collected halfpenny.
- Car 37. Checking this car at Bridge Street while proceeding to Castle Street and found one missed fare in the saloon from Mount Street. I informed Miss MacDonald and she then collected halfpenny.
- Car 5. Checking this car at Holburn Road while proceeding to Bridge of Dee I found two missed penny fares in the saloon from Bridge Street. I informed Miss Haig and saw she collected same.

**PART OF ABERDEEN TICKET INSPECTOR'S REPORT**

found on most British cars. They are comfortably upholstered in a composition leather, while American-made "Rico" sanitary straps are available for the standees. Another feature is the use of patented roof ventilators, known as the "Eros Air Extractors," in place of the customary monitor side-sash ventilation. Illumination is afforded by four six-lamp circuits of Siemens 16-cp. special filament lamps. One each of these lamps is over the conductor's position, another is used to illuminate a white bullseye in the front bulkhead, a fourth for the red bull's-eye tail light required in the rear bulkhead according to Board of Trade regulations, two more for the destination sign and another for the colored box light carried from the upper bulkhead in place of a dasher headlight.

Passengers enter the carbody either through the 21-in. center bulkhead door on the lower deck or the 22-in. door on the upper deck. At busy loading points the front entrance is also used. They are not permitted to leave via the front way except at terminals. For their convenience, as well as that of the conductress, push-button dry-battery bell signals are installed in the bulkheads and the window posts. Platform accidents are minimized by the use of motorman's mirrors, one at the side and one directly in front.

A recent improvement has been the addition of a

**Aberdeen Corporation Tramways.**

**CASH CLERKS' WEEKLY REPORT—(MONDAY)**  
*To the General Manager.*

Are all the Conductors' Pouches in good working order?

Have all the Conductors' shortages been collected?

Has the Weekly Ticket Balance come out right?

Mention any errors discovered in Journals, Ticket Book, &c.—

Mention Conductors with Tickets repeatedly out of order—

Have you had any complaints from Conductors about their work or your work?

Have you all the stock of Tickets and Stationery you require?—

Have you had to work any overtime, and for what reason?

Is there anything which you can suggest for the better working of your Department?

.....

.....

.....

Date, \_\_\_\_\_ Signature, \_\_\_\_\_

**CASH CLERK'S WEEKLY REPORT TO THE GENERAL MANAGER**

has two seats less on the lower deck but gives two seats more on the upper deck. The one in use has already demonstrated its popularity.

**EMPLOYEES**

Like all other British tramways, Aberdeen has been obliged to employ a very large proportion of women. Thus the roster for January 1919 shows 130 conductresses against nine conductors. The eight cash clerks are women and there is also a woman ticket inspector. As the Corporation is obligated to return men to their positions as they return, the few motor-women employed recently have already been replaced although they had proved thoroughly competent. The chief difference in efficiency is due to the fact that the women are absent more frequently. They are inclined to average about one day off every week whereas the men, in accordance with the layout of work, get one Sunday off every three weeks and serve six hours on

TABLE V—SHOWING STAFF OF ABERDEEN CORPORATION TRAMWAYS

	Male	Female	Total
Managerial and administrative.....	2		
Chief clerk.....	1		
Chief cash clerk.....	1		
Cash clerks.....	7		
General office, clerks, traffic clerks, timekeeper, storekeeper, typists, etc.....	5	7	23
Inspectors.....			
Chief inspector.....	1		
Ticket inspectors.....	4	1	
Traffic regulators.....	2		
Motorman inspector.....	1		9
Motormen.....	105		105
Conductors.....	9	130	139
Cleaners.....	28		28
Repair staff.....	52		52
Miscellaneous, including parcels messengers.....	16		16
Total.....	226	146	372

all other Sundays, an average of four and one-half hours for the three weeks. In general, a fifty-four and one-half-hour, seven-day week is in effect, the four and one-half hours on Sunday counting as overtime at 50 per cent additional pay. Fifteen minutes a day is paid for as signing-on or reporting time.

One week, platform employees are assigned two-swing runs, beginning at 7 a.m. and finishing at 6 p.m. with a break between 10 a.m. and 1 p.m. The following week, the same employees start at 10 a.m. and finish at 11.30 p.m. with a break between 1 p.m. and 6 p.m. Before the war the tramway service was given from 5 a.m. to midnight. Up to the present time, the last cars are leaving the center of the city at 11 p.m. Under these circumstances, it is not difficult to arrange the schedule on the basis of two crews to one car.

It may be mentioned here that the public is fully apprised of these "first and last car" schedules through the use of schedule boards which are posted at all terminals and at many places throughout the city.



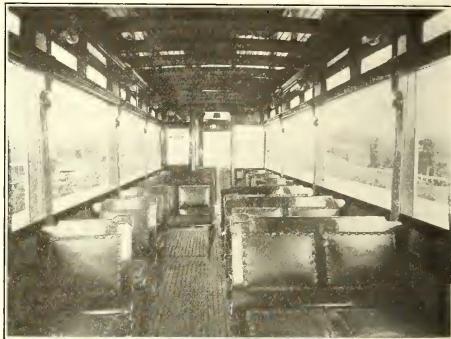
STANDARD ABERDEEN CAR—NOTE THE CHARACTERISTIC TWO-FAMILY GRANITE SUBURBAN HOUSES IN THE BACKGROUND

Headways are so short now that it is no longer necessary to put timetables in the cars.

Wages reach their maximum after four years' service in the case of motormen and three years in the case of conductors and conductresses. The first-year wages of motormen have gone up from £1 3s. 2d. (\$5.56) to £2 17s. 8d. (\$13.84) and those of fourth-year motormen have advanced from £1 13s. 2d. (\$7.96) to £3 7s. 2d. (\$16.12). Conductors' first-year wages are the same as motormen, but do not go beyond the latter's third-year

rate, which is now advanced from £1 10s. 9d. (\$7.38) to £3 4s. 9d. (\$15.55). The wages of women conductors range from £2 3s. 6d. (\$10.45) for the first year to £2 10s. 3d. (\$12.01) for the third year. It is plain from these figures that the increase in wages is as serious a factor in Great Britain as in the United States. In these calculations a shilling is taken as the equivalent of 24 cents.

Although the Aberdeen property with its eighty-six cars and 250 transportation employees is not a big sys-



INTERIOR OF LOWER DECK OF ABERDEEN CAR, SHOWING ARRANGEMENT OF CROSS-SEATS IN STAGGERED RELATION BECAUSE OF DEVIL-STRIP RESTRICTIONS

tem, the highest standards of operation are followed. Traffic is carefully checked every day as shown in the traffic inspectors' reports, ampere-hour meters are on all cars to check the use of energy, Bundy recorders are installed on all the routes for the time-checking of the platform employees, instruction bulletins on the avoidance of accidents reinforce the regular efforts of the motorman instructor, etc. In short, the same spirit of progress shown in building up the income account is manifested in handling the operating details.

## Diesel Engine Defined

THE Diesel Engine Users' Association of Great Britain has formulated some definitions which are now before the members, preliminary to adoption, and which will serve to clarify phraseology in this field. A Diesel engine is defined as a prime mover actuated by the gases resulting from the combustion of a liquid or pulverized fuel injected in a fine state of subdivision into the engine cylinder at or about the conclusion of a compression stroke. The heat generated by the compression to a high temperature of air within the cylinder is the sole means of igniting the charge. The combustion of the charge proceeds at, or approximately at, constant pressure. A semi-Diesel engine is a prime mover actuated by the gases resulting from the combustion of a hydrocarbon oil. A charge of oil is injected in the form of a spray into a combustion space open to the cylinder of the engine at or about the time of maximum compression in the cylinder. The heat derived from an uncooled portion of the combustion chamber, together with the heat generated by the compression of air to a moderate temperature, ignites the charge. The combustion of the charge takes place at, or approximately at, constant volume.

# Eleven Billion Fare Passengers in 1917

## Preliminary Statistics of Bureau of Census Show Accumulating Burdens of Electric Railways—100 Rides a Year to Every Person in United States

THE street and interurban railways of the United States during the calendar year 1917 transported more than eleven billion fare-paying passengers, representing an average of more than 100 trips for each man, woman and child in the United States. The electric railways in that year operated 102,603 cars on 32,535 miles of line, comprising 44,812 miles of track. They employed 294,826 persons, to whom were paid salaries and wages aggregating \$257,240,362. They received revenues amounting to \$650,149,806 from railway operations. The rates of increase in the various items presented by the report were in most cases materially less during the period 1912-17 than during the preceding five years.

The details of this showing are given in Tables I and II from a preliminary report by S. L. Rogers, director of the Bureau of the Census, Department of Commerce. This report, which was prepared under the supervision of Eugene F. Hartley, chief statistician for the manufacture, relates to the calendar years 1917, 1912 and 1907. The statistics cover electric-light plants operated in connection with electric railways and not separable therefrom, but do not cover mixed steam and electric railways or railroads under construction.

The report for 1917 in Table I gives figures for 947 operating and 364 lessor companies. The number of operating companies compares with 975 in 1912 and 945 in 1907. The line mileage represents an increase of 6.9 per cent over 1912 and 27.4 per cent over 1907, and the corresponding rates of increase in track mileage were 9.1 and 30.3 respectively. The total number of cars reported—comprising 79,914 passenger cars and 22,689 freight and other non-passenger cars—shows increases of 9.1 per cent for the period 1912-1917 and of 22.7 per cent for the decade 1907-1917. The electric locomotives in use numbered 357 as compared to 277 in 1912 and 117 in 1907. During the later five-year period an increase of 4.4 per cent in the total number of employees was accompanied by an increase of 28 per cent in salaries and wages; and during the ten-year period 1907-17 the corresponding rates of increase were 33.1 per cent and 70.4 per cent.

The total primary horsepower amounted to 4,200,192 hp. in

1917, an increase of 14.7 per cent over 1912 and of 66.7 per cent over 1907. The great bulk of this power was derived from steam, which contributed 3,543,915 hp. to the total as compared to 627,983 hp. obtained from water and 28,294 hp. from internal-combustion engines. The rate of increase in steam power, however, was considerably less than the rates for the other forms of power.

A pronounced tendency to use larger units appears in the case of all three classes of power. Between 1907 and 1917 the average horsepower of the steam engines increased from 716 to 2036; of the water wheels, from 403 to 1987, and of the internal-combustion engines, from 398 to 534.

In addition to 11,304,660,462 revenue passengers, the electric railways carried 3,021,137,935 transfer and 181,116,176 free passengers, making a total of 14,506,914,573. This total represents an increase of 19.5 per cent during the period 1912-1917 and 52.2 per cent for the

TABLE I—COMPARATIVE CENSUS FIGURES OF ELECTRIC RAILWAYS IN UNITED STATES FOR DECADE 1907-1917

	1917	1912	1907	Per Cent of Increase		
				1907-1917	1912-1917	1907-1912
Number of companies	1,311	1,260	1,236	0.2	22.9	35.2
Operating	947	975	945			
Lessor	364	285	291			
Miles of line	32,534.68	30,437.86	25,547.19	27.4	6.9	19.1
Miles of single track	44,811.53	41,064.82	34,381.51	30.3	9.1	19.4
Cars	102,603	94,016	83,641	22.7	9.1	12.4
Passenger	79,914	76,162	70,016	14.1	4.9	8.8
All other	22,689	17,854	13,625	66.5	27.1	31.0
Electric locomotives	357	277	117	205.1	28.9	136.8
Number of persons employed	294,826	282,461	221,429	33.1	4.4	27.6
Salaries and wages	\$257,240,362	\$200,890,939	\$150,991,099	70.4	28.0	53.0
Total revenue	4,200,192	3,661,385	2,519,823	66.7	14.7	45.3
Steam engines:						
Number	1,741	2,258	3,368	48.3	22.9	23.0
Horsepower	3,543,915	3,165,888	2,411,527	47.0	11.9	31.3
Internal-combustion engines:						
Number	53	48	41			
Horsepower	28,294	24,190	16,355	73.2	17.0	48.1
Water wheels:						
Number	316	383	228	38.6	17.5	68.0
Horsepower	627,983	471,307	91,961	582.9	33.2	412.5
Kilowatt capacity of dynamos	2,928,434	2,505,316	1,723,416	69.9	16.9	45.4
Output of stations, kilowatt-hours	7,240,502,789	6,002,659,036	4,759,130,100	52.1	20.6	26.1
Energy purchased, kilowatt-hours	4,947,348,042	3,017,368,753	1,533,080,766	52.2	19.5	27.3
Passengers carried	14,506,914,573	12,135,341,716	9,533,080,766	52.2	19.5	27.3
Revenue	\$1,304,660,462	\$,945,554,667	\$,744,114,508	51.8	18.4	28.3
Transfer	3,021,137,935	2,423,918,024	1,995,658,101	51.4	24.6	21.5
Free	181,116,176	165,869,025	96,308,157	88.1	9.3	72.2
Revenue car mileage	2,139,222,950	1,921,620,074	1,617,731,300	32.2	11.3	18.8
<b>Income account (operating companies):</b>						
Railway operations—revenues	\$650,149,806	\$535,996,122	\$400,896,034	62.2	21.3	33.7
Auxiliary operations—revenues	59,675,286	31,515,382	17,291,824	245.1	89.4	82.3
Non-operating income	20,282,948	18,418,813	11,556,396	75.5	10.1	59.4
Income from all sources	\$730,108,400	\$585,930,517	\$429,744,254	69.9	24.6	36.3
Operating expenses	\$452,594,654	\$332,896,356	\$251,309,252	80.1	36.0	32.5
Deductions from income (including taxes)	221,062,456	184,894,272	138,094,716	60.1	19.6	33.9
Net income	\$56,450,930	\$68,139,889	\$40,340,286	39.9	0.7	68.9
Dividends <i>g</i>	48,337,435	51,650,117	26,254,372	82.7	06.4	95.2
Surplus	\$8,113,495	\$16,489,772	\$13,885,554	441.6	50.8	18.8

(a) Denotes decrease.  
 (b) Lessor companies, 1917, include companies maintaining separate organization though leased to and controlled through stock ownership by other companies, largely in Pennsylvania. In 1912 and 1907 these were treated as merged and not included in the number reported.  
 (c) Includes track lying outside the United States (1917, 29,955 miles; 1912, 31,911 miles; and 1907, 27,52 miles), but excludes track not operated.  
 (d) For 939 companies.  
 (e) Figures not available.  
 (f) Inclusive of charges for sinking funds, carried as profit and loss accounts.  
 (g) Dividends were paid by 300 operating companies in 1917 and by 292 in 1912.

decade 1907-1917. The revenue car mileage totaled 2,139,222,920, an increase of 11.3 per cent over 1912 and of 32.2 per cent over 1907.

The electric power consumed in 1917 aggregated 12,187,850,831 kw-hr., of which 7,240,502,789 kw-hr. were generated by the companies themselves and 4,947,348,042 kw-hr. were purchased. The rate of increase in total power consumed during the five-year period 1912-

TABLE II—INCOME STATEMENT OF ELECTRIC RAILWAYS IN UNITED STATES FOR THE CALENDAR YEARS 1917 AND 1912

	1917	1912
Railway operations—revenues.....	\$650,149,806	\$535,996,122
Railway operations—expenses.....	421,250,838	*
Net revenue, railway operations.....	\$228,898,968	*
Auxiliary operations—revenues.....	\$59,675,286	\$31,515,582
Auxiliary operations—expenses.....	31,343,816	*
Net revenues, auxiliary operations.....	\$28,331,470	*
Net operating revenue.....	\$257,230,438	\$234,615,348
Taxes assignable to operations.....	45,756,695	*
Operating income.....	\$211,473,743	*
Non-operating income.....	20,282,948	18,418,813
Gross income.....	\$231,756,691	*
Deductions from gross income.....	175,305,761	*
Net income.....	\$56,450,930	\$68,139,889
Dividends.....	48,337,435	51,650,117
Surplus.....	\$8,113,495	\$16,489,772
Profit and loss accounts:		
Charges to sinking fund and other reserves.....	\$9,927,578	\$6,229,136
Sundry appropriations of net income.....	8,257,632	*
Profit and loss credits.....	\$18,185,210	*
Net total.....	\$16,979,300	*
Deficit.....	\$8,865,805	*

\*Exact comparative figure not available; see text.

1917, which amounted to 35.1 per cent, was much greater than the rates of increase during the same period in revenue car mileage and passengers carried—11.3 per cent and 19.5 per cent respectively. This difference was due mainly to the rapid increase in the light and power business done by the railway companies.

The income of the companies from all sources in 1917 aggregated \$730,108,040, of which sum \$650,149,806 represented revenues from railway operations, \$59,675,286 was derived from auxiliary light and power business and \$20,282,948 was non-operating income. The revenues from railway operations increased by 21.3 per cent during the period 1912-1917 and by 62.2 per cent between 1907 and 1917, but those from light and power business increased by 89.4 per cent and 245.1 per cent during the five-year and ten-year periods respectively.

The operating expenses aggregated \$452,594,654, an increase of 36 per cent over 1912 and 80.1 per cent over 1907. The deductions from income, comprising taxes, interest and other fixed charges, amounted to \$221,062,456, an increase of 19.6 per cent for the later five-year period and of 60.1 per cent for the decade. The net income, therefore, was \$56,450,930, a sum less by 17.2 per cent than the net income of 1912 but greater by 39.9 per cent than that of 1907. Of the 947 operating companies, 300 paid dividends aggregating \$48,337,435, a decrease of 6.4 per cent as compared with 1912.

#### OBSTACLES TO FULL COMPARISON

The second monetary column in Table II was added by this journal to indicate as far as possible the comparison between the full income statements for 1912 and 1917. It is explained by the Bureau of the Census, however, that a complete comparison is impossible because the schedule for the census of 1917 differed in some respects

from that used in 1912. These differences were caused by changes in the I. C. C. system of accounts.

For example, the \$535,996,122 of revenues from railway operations and the \$31,515,582 of revenues from auxiliary operations as now reported for 1912 can be checked against the differently combined figures given in the 1912 census report, but no exact information is at hand to show how the \$322,896,356 of operating expenses for 1912 should be divided between railway operations and auxiliary operations. This amount of \$322,896,356 includes "operating expenses of light and power departments" to the amount of \$14,195,822, but it is not clear that this latter sum represents all expenses chargeable against light and power operations. Hence strictly comparable figures are not deducible.

Furthermore, in 1917 the revenues and expenses of auxiliary operations other than those of the light and power department are included under "auxiliary operations." These revenues amount to \$5,326,411 and are included in the \$59,675,286. Such was not the case in 1912 and 1907. The auxiliary operations—revenues of 1912 and 1907 (\$31,515,582 and \$17,291,824 respectively) pertain to "light and power departments only."

With respect to taxes, too, the schedules differ. In 1912 and 1907 the taxes were a deduction from income and were reported as a whole for all operations, amounting to \$35,027,965 in 1912 and to \$19,765,602 in 1907. In the 1917 schedule, however, "taxes assignable to operations" were reported. Taxes assessed on "miscellaneous physical property" do not enter into this account. The differences, perhaps, are not very important, and in general it may be said that the figure given for 1917, namely, \$45,756,695, is fairly comparable with the foregoing figures for 1912 and 1907.

The 1912 census report gives a net income of \$61,910,753 after the payment of \$191,123,408 for deductions from income, including taxes, interest, rentals and miscellaneous. It will be noticed that the 1912 figure for deductions from income, as given in Table I, is \$184,894,272. This difference of \$6,229,136 is due to "charges for sinking fund," which according to the present I. C. C. system of accounts is a "disposition of net income" account, whereas in 1912 it was under "deductions from gross income."

The foregoing explains the increase in net income to \$68,139,889 for 1912 as reported in Table I and Table II, for the changes in "deductions from gross income" and in "net income" are counterbalancing. It also explains the change in surplus from the \$10,260,636 reported in the 1912 census to the \$16,489,772 in Tables I and II.

Lastly, in regard to the profit and loss accounts shown in Table II, changes in the schedules make it impossible to give comparable figures except with respect to "charges for sinking fund and other reserves." But the 1912 schedule called for "charges for sinking fund, if any," while the 1917 item included "other reserves." Possibly all items of the latter character were not included under "charges for sinking fund" in 1912. Otherwise, the amount in 1912 comparable with the \$9,927,578 of 1917 is the item of \$6,229,136 before noted. Comparative figures for "sundry appropriations of net income" and "profit and loss credits" are not available for 1912. The following comparison can be made:

	1917	1912
Surplus.....	\$8,113,495	\$16,489,772
Charges for sinking fund and other reserves.....	9,927,578	6,229,136
Balance.....	Deficit \$1,814,083	Surplus \$10,260,636



# Western Railway Club Holds Electrical Night

Paper by Messrs. Potter and Dodd Shows More Railroad Electrification and Larger Percentage of Steam Line Electrified in America Than in Rest of World—Saving in Coal, Design of Locomotives and Current Collection Considered

ON MONDAY night, April 21, the Western Railway Club held its first electrical night at the Sherman Hotel, Chicago. A get-together dinner preceded the meeting. The evening was devoted to a paper on "Electrification of Trunk Line Railroads" by W. B. Potter, chief engineer, railway and traction department, General Electric Company, and S. T. Dodd, railway and traction engineering department, General Electric Company.

The paper, an abstract of which appears below, was delivered by Mr. Dodd and was followed by lantern slides of representative American installations explained by Mr. Potter. Mr. Potter also described competitive tests which had been conducted between electric and steam locomotives to the glory of the former. He stated that he believed extensive electrification would soon take place in France and Italy.

In the discussion which followed the slides, E. Marshall, electrical engineer Great Northern Railway, explained various features of the 27 miles of electrification on his road, outlining some of the difficulties resulting from three-phase service. He stated that probably there would be no more three-phase lines built. N. W. Storer, traction engineering division, Westinghouse Electric & Manufacturing Company, emphasized the importance of the conservation of fuel. He said that it is not expected that all the railroads will be electrified, but in many instances the possible advantages are so great that undoubtedly many roads will be electrified soon. Regeneration by electric locomotives, he said, gives ease of control, permits a great saving of power and makes for greater safety of operation. The question of the type of drive appeals strongly to the steam railroad operator, and each line wants to satisfy its own ideas sometimes at the expense of efficiency in operation. The big question now is what is the tendency of the times. What weight of train is to be the future requirement and what will be the limit of demand, e.g., weight, length of train, speed, etc.? Is it necessary that large fleets of freight trains be moved almost simultaneously? On these and other questions the builders of electric locomotives must receive information from railroad operators.

O. C. Cromwell, mechanical engineer, Baltimore & Ohio Railroad, spoke briefly on the electrification of his road. In answer to questions, Mr. Potter explained that the controlling factors as to whether a given railroad should adopt a.c. or d.c. service are the relative cost of maintenance and upkeep and whether constant or variable speed is desired.

Following the discussion a moving picture entitled "The King of the Rails" was run. An abstract of the paper by Messrs. Potter and Dodd follows:

## MAIN LINE ELECTRIFICATION

The subject of main-line electrification is one of world-wide importance but seems to have been recognized especially in the United States, for in spite of our great mileage we have more actual main-line electrification and a greater proportion of our total

mileage electrified than all the rest of the world. The following approximate statements will show this fact:

RAILWAY ROUTE MILEAGE OF THE WORLD	
United States .....	265,218
Europe .....	217,000
Rest of the world .....	230,902
Total .....	713,120

The 265,000 miles in the United States represents about 400,000 miles of single track. To this must be added about 50,000 miles of trolley lines; making the total railway single track in the United States approximately 450,000 miles.

In considering heavy electrification, if we eliminate the electric roads which are devoted strictly to motor car service and include under our category those tracks, both steam road and trolley, which are handling freight and passenger service with electric locomotives, we find in the United States approximately 675 electric locomotives operating over 4875 miles of route, or 8300 miles of electrified track. Compared with this, in all the rest of the world there are approximately 450 electric locomotives operating over 1000 miles of route, or 1750 miles of track. That is, the percentage of electrified route mileage in the United States is about ten times as much as the percentage in all other countries combined.

## REASONS FOR ELECTRIFICATION

Probably the freedom from smoke and cinders has been the definite impelling cause in all the early electrifications. Such systems as the Baltimore Tunnel, the New York Central Terminal at New York, the Detroit River Tunnel and the Cascade Tunnel on the Great Northern, were primarily electrified in order to overcome the disadvantage of smoke.

To-day, however, there is an argument for electrification which within the last two years has been more sharply emphasized than any other. This is the conservation of fuel. When we realize that 25 per cent of the coal mined in the United States is used on its railroads, we see the importance of considering this feature. This, therefore, is the only one among the various reasons for electrification to which we will particularly direct attention.

To present a figure showing the economy of electric operation it is necessary to make some sort of estimate of the ton-miles included in railway traffic. Taking the reports of revenue traffic for the year 1914 and including the estimated tonnage of cars and locomotives, we find that the railway traffic for that year amounted to about 1,000,000,000,000 ton-miles. Out of this, the movement of coal for railway purposes, together with the coal cars and locomotive tenders carrying the same, amounted to about 12 per cent.

The energy demand per 1000 ton-miles for railroad service varies widely under different conditions, but the average on the recently electrified sections is approximately 33 watt-hours at the power house per ton-mile moved over the railroad. For contingencies we might

increase this item approximately 20 per cent and we have assumed in the following table 40 watt-hours per ton-mile as an amply conservative basis for estimating the electric energy.

POWER DEMAND FOR ELECTRIC OPERATION OF STEAM RAILWAYS IN UNITED STATES—1914

Ton-miles excluding tenders but including 25 per cent of the railway coal cars.....	930,000,000,000
Watt-hours per ton-mile (assumed).....	40
Annual energy consumption, kilowatt-hours.....	37,200,000,000
Coal required at central steam power stations at 2.2 lb. per kilowatt-hour, tons.....	40,000,000
Average continuous load, kilowatts.....	4,250,000

The actual fuel used on steam locomotives for the year in question was 128,400,000 tons of coal and 40,000,000 bbl. of oil, or a total coal equivalent of 140,000,000 tons. The preceding table shows that the same tonnage could have been moved with electric locomotives by an expenditure of 40,000,000 tons, a saving of 100,000,000 tons per year. It is difficult to know how to emphasize this conclusion. We admit that the statistics which we have presented are more or less approximate, but the indication that electrical operation of railways in the United States would result in a yearly saving of 100,000,000 tons of coal is in itself a conclusion that, in view of the critical conditions of the last two years, must demand attention. We do not propose to suggest that all the railroads in this country will ever be operated electrically, certainly not within any reasonable time, but the figures to which we have called attention emphasize the importance from this standpoint of considering railway electrification wherever the conditions admit.

The figures given were prepared on the basis of the 1914 reports when the coal production for the country was 513,000,000 tons. Statistics for the last year are not available, but unofficial estimates have indicated that the coal production for 1918 was 685,000,000 tons. All the figures given in the preceding table would presumably be increased by 25 per cent to 30 per cent in order to represent conditions to-day.

FURTHER SAVING FROM WATER POWER

Although for purposes of comparison we have devoted considerable space to the saving in fuel that would result from the use of central steam power stations for the operation of railways, it is self-evident that the utilization of water power is more vital to the subject as affording the only known means for effectually conserving our limited fuel supply. At the present time, the water-power development in the United States amounts to about 5,000,000 kw. Knowledge as to the possible future hydraulic development is indefinite, as many of the water-power sites have not been completely surveyed. Estimates as to the presumable ultimate development vary considerably, but are around 50,000,000 kw.

The relative amount of power required for complete railway electrification is less than is usually supposed. A number of power stations capable of delivering 37,200,000,000 kw.-hr. per year with an average twenty-four-hour load of one-half the installed capacity would have an aggregate installation of approximately 8,500,000 kw. The statistics of steam and hydraulic electric power plants in the United States indicate that in 1917 there were installed, in central stations for lighting and power purposes, approximately 9,000,000 kw., in railway power stations 3,000,000 kw., and in isolated stations 8,000,000 kw.; a total installed capacity of about 20,000,000 kw. It is apparent that instead of the prob-

lem being prohibitive in size, there is already installed in the country a power station capacity of more than twice the requirement for operating all the railroads electrically. The power that would be required really is not excessive as compared with the electrical development which has already been accomplished.

The present tendency of modern power development, both steam and hydraulic, is toward the growth of large central power stations and inter-connected distributing systems. These power stations will be situated at points of cheap coal supply or of hydro-electric development, and will furnish power for cities and industries over a wide section. The same systems will also furnish power for the railways in their territory.

The Montana Power Company may be cited as an illustration. This company has twelve hydraulic power stations feeding into a common distribution system at 100,000 volts. The total installed capacity is approximately 175,000 kw. with possible extensions by future development of an equal amount. Power is furnished for lighting and industrial purposes to various cities throughout the state and also to the Chicago, Milwaukee & St. Paul Railway. The average twenty-four-hour power demand for the 440 miles of the Chicago, Milwaukee & St. Paul electrification is only in the order of 15,000 kw. with a maximum of about 28,000 kw.

DESIGN OF LOCOMOTIVES

A comparison of American electric locomotive development with European, and particularly Continental, shows a characteristic difference in the method of transmitting the power of the motor to the driving wheels. In America the success attained with the many heavy high-speed motor cars and the utilization of these cars in many cases for hauling trains, naturally led to the building of similar equipment for locomotive purposes only. This type of locomotive is the most economical design, but as the tractive effort is transmitted through the truck center pin, this type is commonly limited to a weight of about 60 tons. For heavier locomotives of this type, weighing from 60 to 100 tons, the two trucks are usually connected and the tractive effort transmitted directly through the trucks instead of through the locomotive frame.

The Continental designers, having had little experience with heavy motor-car equipment, were skeptical of gearing and the practice of mounting motors directly on the axle. Their efforts have been mainly directed toward substituting the electric motor for the steam locomotive cylinder, retaining all of the side rods and adding a few more. There is a difference, however, between driving side rods from a steam piston and from a motor-driven crank, which does not seem to have been fully appreciated. In a steam engine the maximum stresses and pin pressures, so far as the driving power is concerned, may be predetermined from the piston area and steam pressure. In an electric locomotive, however, having a motor-driven crank and side rods, the maximum stresses are influenced by variations in the wheel centers and the wear of bearings. The mechanical design must be strong enough to withstand the driving torque at 45 deg. angle from the center, and at as much less angle as may result from the variations. As an extreme illustration, with one side stripped and the other on dead center, the stresses would be in excess of any practicable design.

The Continental locomotives show many variations of the side-rod drive, both with the jack cranks direct driven by the motor through parallel rods or by means of gearing. Comparing only the most important trunk-line electrifications in Europe and America, we find that out of nine European railroads operating 210 locomotives, there are represented twenty-eight different types, while out of fourteen American railroads operating 364 locomotives only twenty-one types are represented. The cause for this difference is to be found in the historical development outlined herein and in the fact that the American development has largely been determined by commercial reasons.

The design of American locomotives for low speed freight and passenger service has been influenced largely by the heavy motor car with motors geared directly to the driving axle. A gearless motor which could develop as tractive effort a proportion of the weight on the axle comparable to the geared motor would furnish a still simpler design. Recent developments along this line indicate the possibility of such a gearless low-speed locomotive at a comparable price.

The design of electric locomotives for high-speed passenger service at 60 to 80 m.p.h. is a more complicated problem. A substantial saving through the elimination of turntables and incident delays being obtained by designing the locomotive double ended and capable of running equally well in both directions, this desirable requirement involves features of design differing from that of a steam locomotive built for operation in one direction only.

A feature in the design of a double-ended locomotive is to control the lateral oscillation and to minimize its effect on the track. This characteristic is more in evidence on tangent track where the flanges of the guiding wheels are free to move within the clearance, than on curves where the flanges of these wheels bear firmly against the outer rail. This characteristic also appears, though in a different form, in the single ended steam locomotive, as the front and rear ends are not both subjected to the reactionary influence of two guiding trucks. In any event the wheels at the front and rear ends must be relied upon to withstand the effect of these lateral oscillations.

In a double-ended locomotive with guiding trucks at each end, any lateral oscillation will deliver a thrust at the truck center plate both at the front and rear ends. The roll of the locomotive body has little tendency to transfer weight to the outside guiding wheels and, therefore, has but little effect in holding down the outer rail. The lateral movement of the locomotive, however, does increase the weight transferred to the outside guiding wheels in proportion to the height of the center plate above the rail head.

The problem presented is to design a double end locomotive with leading and trailing trucks which shall have sufficient guiding force for the front end and with such characteristics as to minimize the cause and effect of lateral oscillations.

To minimize the cause of lateral oscillations the front and rear trucks should be restrained so far as possible from any individual movement, other than that essential to proper guiding of the locomotive. Experience has demonstrated that a two-axle truck with an articulated connection accomplishes this desired result much more effectually than either a two-axle bogie or pony truck.

To minimize the effect of lateral oscillations the characteristics should be such that the truck will allow

a time element during delivery of the thrust against the rail head and such that any lateral thrust at the center pin will produce a large vertical component at the outer guiding wheels. Raising the bearing point or center plate of guiding trucks to 60 in. or 70 in. above the rail head has shown by tests that these characteristics can be obtained in that manner. We wish to direct attention to the fact that a successful double-ended high-speed locomotive can only be obtained by a proper study of the front and rear trucks.

For high-speed passenger service with speeds of the order of 60 to 80 m.p.h. if a locomotive is equipped with geared motors the gear reduction approaches a small ratio, if the armature is to be kept within practical rotative speeds. This presents all the disadvantages of increased weight due to gears with their cost of maintenance without the compensating advantage of the increase in tractive effort usually gained by gear reduction. Consequently, it appears to us that for such speeds and for such service the gearless motor with the armature mounted directly on the axle presents the best solution. The bipolar gearless motors on the New York Central Railroad which have been in service for twelve years have shown very low maintenance.

#### COLLECTION OF CURRENT

The trolley pole and wheel which has so well served the electric railway is not well adapted for the heavy service we have been considering, nor is it a convenient device for movement in both directions. The pantograph collector which requires no attention on reverse movement has long been used, but it is only within the past few years that its capacity as a collecting device has been fully demonstrated. Rolling and sliding contacts have both been tried with results distinctly in favor of the slider. The wear of the working conductor or trolley wire is due far more to the destruction by arcs at the point of contact than from the mechanical friction, hence it is most important that the wire be so supported as to eliminate any rigid spots which are the usual cause of this arcing. The wire should be lifted slightly and really supported by the collector rather than that the collector should run underneath a wire held in rigid relation to its support. Lubrication of the collecting surface not only reduces the wear but seems slightly to improve the contact presumably because of less tendency to chatter than with bare metal. The amount of current that can be successfully collected seems limited only by the current capacity of the working conductor. Tests have shown no arcing at the contact with 3000 amp. at 30 m.p.h., and 2000 amp. has been collected with equal success at more than 60 m.p.h. A copper conductor with copper wearing strips on the collector has been found to give the best results. Measurements taken on the Milwaukee Railway indicate the working conductor will have a life of more than 100 years before it will have to be replaced because of wear.

#### REGENERATION

Regeneration as used in this connection implies the use of electric braking and the utilization of the energy in the train as electric power, which is fed back into the distributing system. The train on a down grade drives the motors as generators, which is comparable to the action of falling water in a hydroelectric power station. Regeneration is of especial advantage on the long grades encountered in mountain districts. Grades of 20 to 50 miles in continuous length are found on almost all the

railway lines crossing the Continental Divide. It eliminates the surging in the train and the variations of speed which are encountered in holding the train by air brakes. In addition to this, the wear of brakeshoes is eliminated and the delays which are often due to overheated brakeshoes on long grades are also avoided. The electric braking takes place entirely at the front end of the train, taking up all slack, and permits the air reservoirs to remain fully charged in reserve for emergency.

The amount of power returned to the trolley by regeneration varies with the amount of the grade and the type of train. On specific tests it has been shown that a train on a 2 per cent grade has regenerated 42 per cent of the power required to pull the same train up the grade. On a 1.66 per cent grade 23 per cent has been regenerated. The records for a particular month over the entire Rocky Mountain Division of the C. M. & St. P. for both freight and passenger trains show that the regeneration was equivalent to 11.3 per cent of the total power used.

## A Franchise Is a Binding Contract

Supreme Court Decides in Columbus Railway Case that Unprofitableness Is No Excuse for Non-Execution

A DECISION was rendered by the United States Supreme Court on April 14 in the case of the Columbus Railway, Power & Light Company, appellant, vs. the City of Columbus, et al. The case arose over the right of the company to surrender and cancel two franchises, one passed on Feb. 4, 1901, and the other on Jan. 1, 1901, each for twenty-five years. These franchises called for the sale of eight tickets for 25 cents with universal transfers. The company declared that owing to an increase in its operating expenses the gross earnings of its railway lines for the year ending June 30, 1919, will fall short by approximately \$250,000 of paying expenses, depreciation and taxes, leaving nothing for fixed charges or any return to the company on the value of its property. Part of the increase in operating expenses, *i. e.*, \$560,000, was because of an increase in wages ordered by the National War Labor Board. The company set forth the importance to the federal railroad and military authorities of the maintenance by it of good service as a public utility and that the existing rates of fare were inadequate and confiscatory and that it desired to charge 5 cents for a single ride and 1 cent for a transfer.

### THE DECISION HOLDS THE CONTRACT BINDING

The court first considered jurisdiction and held that on account of federal questions involved it could act.

It then held that the franchise, after being accepted by the company, was a binding contract, citing in support *Cleveland vs. Cleveland Railway Company*, 194 U. S. 512. Continuing, the court said:

We can have no doubt that under the authority of the laws referred to and in view of the terms of the ordinances in question and the acceptances by the grantees the city of Columbus made valid and binding contracts with the companies, binding for the term of twenty-five years. By these contracts, obligatory alike upon the city and the company, the city granted the right to use the streets and the company bound itself to furnish the contemplated service at the rates of fare fixed in the ordinances. We cannot agree with the contention of the appellant that these were permissive franchises, granted and accepted with the right upon the part of the company to abandon the uses and purposes for which the franchises were granted

because the rates fixed became unremunerative as alleged in the amended bill. The authority under which the city acted came from the State, and was granted by proper statutes passed for that purpose. The contracts were made between the city and the company, and became mutually binding for the period named in the ordinances. This case does not involve the remedies which may be invoked against a street railway company which is or may become insolvent because of conditions arising since it entered into a given contract. The company seeks now by its own action to terminate the contracts, still binding upon it by their terms as to rates of fare to be charged, and seeks to have the aid of a court of equity by enjoining the city from any further requirement of service under them.

There is no showing that the contracts have become impossible of performance. Nor is there any allegation establishing the fact that taking the whole term together the contracts will be necessarily unprofitable. This case is not like the *Denver Water Works* case, 246 U. S. 178, and the *Detroit Street Railway Company* case, 248 U. S. 429, in both of which the franchise to use the streets of the city had expired by limitation, and it was sought to require continued operation of a water-works system in the one case and in the other of a street railway system, under rates which would afford no adequate return to the companies. In this case the company seeks the aid of a court of equity to avoid contracts duly made and entered into while the same are yet in force.

We are unable to find in the allegations in this bill any statement of facts which absolves the company from the continued obligation of its contracts unless the facts to which we have referred bring the case, as is contended, within the doctrine of *vis major*, justifying the company in its attempt to surrender its franchise, and be absolved from further obligation.

NOT LIKE "KRONPRINZESSIN CECILIE" OR MILWAUKEE CASES

We come then to consider whether the amended bill shows the happening of an event or events which have released the company from the obligations of the contract, and authorized it to cancel the same upon the surrender of its franchise. Justification for that course is said to exist in the conditions following the World War and resulting therefrom, particularly, in the great increase in wages by the arbitral award of the National War Labor Board which was due to the cost of meeting the high cost of living as a direct result of war conditions. This it is contended, presents a situation that made the subsequent keeping of the contract practically impossible except at a ruinous loss to the company. It is insisted that the principle recognized by this court in *Kronprinzessin Cecilie*, 244 U. S. 13, when applied to this case shows the existence of conditions excusing the performance of the contract. In that case it was held that the master and owner of the German steamship *Kronprinzessin Cecilie* were justified in apprehending that she would be seized as a prize if she completed her voyage to Plymouth and Cherbourg on the eve of the war, and her return to this country was a reasonable and justifiable precaution in view of the situation; that there was no liability for the shipments of gold agreed to be carried in that case; that the contract, not making an exception in the event of war intervening before delivery of the cargo, the circumstances showing peril of belligerent capture, afforded an implied exception to the carrier's undertaking.

Much reliance is had by the appellant on the language used by Mr. Justice Jackson speaking for this court in *Chicago, Milwaukee & St. Paul Railway vs. Hoyt*, 149 U. S. 1, 14, 15, wherein it was said: "There can be no question that a party may by an absolute contract bind himself or itself to perform things which subsequently become impossible, or pay damages for the nonperformance, and such construction is to be put upon an unqualified undertaking, where the event which causes the impossibility might have been anticipated and guarded against in the contract, or where the impossibility arises from the act or default of the promisor. But where the event is of such a character that it cannot be reasonably supposed to have been in the contemplation of the contracting parties when the contract was made, they will not be held bound by general words, which, though large enough to include, were not used with reference to the possibility of the particular contingency which afterward happens."

Particular reliance is had upon the last sentence of the paragraph just quoted. This language was used in interpreting a contract of doubtful import, as the context shows. Such interpretation was made in view of the situation of the parties at the time when the contract was made, and in view of the nature of the undertaking under consideration.

It certainly was not intended to question the principle, frequently declared in decisions of this court, that if a party charge himself with an obligation possible to be performed, he must abide by it unless performance is rendered impossible by the act of God, the law, or the other party. Unforeseen difficulties will not excuse performance. Where the parties have made no provision for a dispensation, the terms of the contract must prevail. *United States vs. Gleason*, 175 U. S. 588, 602, and authorities cited; *Carnegie Steel Company vs. United States*, 240 U. S. 156, 164, 165. The latest utterance of this court upon the subject is found in *Day vs. United States*, 245 U. S. 154, in which it was said: "One who makes a contract can never be absolutely certain that he will be able to perform it when the time comes, and the very essence of it is that he takes the risk within the limits of his undertaking. The modern cases may have abated somewhat the absoluteness of the older ones in determining the scope of the undertaking by the literal meaning of the words alone. The *Kronprinzessin Cecilie*, 244 U. S. 12, 22. But when the scope of the undertaking is fixed, that is merely another way of saying that the contractor takes the risk of the obstacles to that extent."

After quoting from one or two other cases in support of its conclusions the court said:

It is undoubtedly true that the breaking out of the World War was not contemplated, nor was the subsequent action of the National War Labor Board within the purview of the parties when the contract was made. That there might be a rise in the cost of labor, and that the contract might at some part of the period covered become unprofitable by reason of strikes or the necessity for higher wages might reasonably have been within their contemplation when the contract was made and provisions made accordingly. There is no showing in the bill that the war or the award of the War Labor Board necessarily prevented the performance of the contract. Indeed, as we have said, there is no showing, as in the nature of things there cannot be, that the performance of the contract, taking all the years of the term together, will prove unremunerative. We are unable to find here the intervention of that superior force which ends the obligation of a valid contract by preventing its performance. It may be, and taking the allegations of the bill to be true, it undoubtedly is, a case of a hard bargain. But equity does not relieve from hard bargains simply because they are such. It may be that the efficiency of the service and fairness in dealing with the company which performs such important and necessary service ought to require an advance in rates; such was the strongly announced opinion of the National War Labor Board. But these and kindred considerations address themselves to the duly constituted authorities having the control of the subject matter.

We reach the conclusion that the District Court was right in holding that this bill presented no grounds absolving the company from its contract, and justifying the surrender of its franchise. It follows that the decree is affirmed.

## American Welding Society Progressing

The American Bureau of Welding, to operate under the auspices of the American Welding Society, was organized on April 11 with C. A. Adams as director, H. M. Hobart and A. S. Kinsey as vice-directors, W. E. Symons as treasurer and H. C. Forbes as secretary. Regular meetings of the bureau are to be held on the third Friday of each month. The bureau voted to establish a research committee and appointed fifty-two men representing a wide variety of interests to the committee. The membership of the committee will be augmented from time to time as needed.

Among the members of the research committee are experts from manufacturing companies and governmental and other bureaus. Included are men from the Bureau of Standards, Lloyds' Register of Shipping, National Research Council, Electrical Testing Laboratory, Massachusetts Institute of Technology, Stevens Institute of Technology, United States Navy Yard, University of Illinois, Lehigh University, University of Vermont and American Bureau of Shipping.

## Why Gasoline Can't Compete in City Service

Gasoline Cars Cannot Coast or Stand without Consuming Much Fuel. Thus Raising Average Unit Consumption to Extremely High Figures

By F. KINGSLEY

THESE seems to be some questioning of my last week's reference to gasoline as a prohibitively costly fuel. Also, the fact (mentioned at the same time) that gasoline may cost seven times as much as electricity for surface car operation appears to be too strong a medicine for our persistent radicals to swallow—if we may term as radicals those who insist that electricity as a motive power belongs to a past era. In consequence, I wish to submit, in detail, the derivation of the figure referred to, together with the remark that, so long as the proponents of the gasoline engine kept it on rubber tires we were at a disadvantage because there were a lot of things about automobiles that we didn't understand. However, now that the gasoline engine has been suggested in all seriousness for rail traction it becomes possible to make direct and accurate comparisons of gasoline and electricity.

To do this we need to start only with the assumption of a pair of similar cars, one with gas drive and the other with electric motors which consume, say, 1 kw.-hr. per car mile. Details as to size and weight of car are unimportant, although it may be remarked that such an energy consumption would be expected from a typical one-man car of about the same size as the one with which Henry Ford is going to revolutionize our industry. Details regarding speed and stops per mile are also unimportant except in so far as they affect the duration of what electric railway operators generally call length of unit run.

Here it becomes necessary to descend to first principles by pointing out that a street car, contrary to common impression, does not progress from one end of the line to the other at a constant and leisurely rate. Instead, its progress is made up of a series of relatively short jumps, or unit runs, which are made between stops. These runs may have a length of only one block or may be extended to eight or ten blocks, depending upon the wishes of riders to alight or pedestrians to ride. In general, however, experience has shown that for city operation the average run has a length of the order of 600 ft., and a duration of, say, forty-five seconds. Each of these runs is made up of a cycle of operations that is invariable in its order. First, there is a rapid acceleration (in modern cars sometimes reaching 2.5 m.p.h.p.s.); then the power is shut off and the car "coasts," gradually losing speed as it runs under momentum; then when the next stopping point is almost reached the brakes are applied hard so as to bring the car to a halt as quickly as possible after the brakes go on; finally there is a stop of several seconds while passengers get on and off. Then the whole cycle is repeated, with only such changes as are necessitated by changing distances between stops and interferences by vehicles or unfortunate pedestrians.

### POWER REQUIRED FOR ONLY 22 PER CENT OF TIME

Without going into too exhaustive details, it may be said that the rule of rapid acceleration has been demonstrated beyond any shadow of doubt. If acceleration is slow the car doesn't gain a high running speed before

it is time to apply brakes for the next stop, and if the running speed is low the average speed, or schedule speed, is also low, and slow schedules mean high costs and accelerated receiverships. Also, paradoxical as it may be, rapid acceleration is economical of power. In brief, rapid acceleration is an essential of surface car operation. To obtain it, 50 hp. of motors have been placed on recent 7-ton cars. And these motors frequently may be called upon for 75 hp. under unfavorable starting conditions, since overload capacity is a recognized characteristic of electric motors, if not of the gas engine.

As a result of this requirement it is invariably the case that a modern surface car demands a large amount of power during a short period of acceleration and then demands no power at all during the other operations within each cycle or unit run. The duration of the period of acceleration may be said to be ordinarily not far from ten seconds with reasonably modern equipment. The duration of the remainder of the average cycle would thus be thirty-five seconds. City railway motors, then run in cycles roughly approximating full load for 22 per cent of the time and no load for 78 per cent of the time. This condition applies whether the motive power is electricity or gasoline. And also it is the condition which prevents the modern internal combustion engine, marvelous as it is, from ever displacing electricity for general city car operation, because the gas engine cannot run idle without using fuel.

To elaborate, the modern gas engine is a four-cycle machine. The pistons get an impulse only once in four strokes. Naturally the mechanical efficiency is not high, being of the order of 75 per cent. Consequently, when the engine runs at "no load," something like one-fourth as much energy is required to keep the engine turning over at speed as is required to pull the full load. In addition, the thermal efficiency at light loads is low and the unit fuel consumption is roughly doubled. An authority states that in explosion engines the total no-load consumption ranges from 30 per cent to 45 per cent of the total consumption at normal load. Making allowance for the various factors such as reduced turn-over speed, irregular operation, careless handling and sloppy maintenance which may be expected in street car service, it is at least safe to take the lower of the above figures for the fuel consumption during the 78 per cent idle time.

#### ELECTRICITY, 1.5 CENTS; GASOLINE, 10.5 CENTS

Unit fuel consumption for an automobile engine under full load test seems to range from 0.8 lb. to 1.2 lb. of gasoline per brake-horsepower per hour, so that 1 lb. per horsepower-hour may be adopted as an average during the acceleration period of the hypothetical gasoline-driven street car in question. During the idle time the rate of consumption would then be 30 per cent of 1 lb., or 0.3 lb. for each horsepower developed at full load, but since the idle time is 3.5 times as long as the power-on period the total consumption while idling would be 1.05 lb. of gasoline for each horsepower-hour developed during the power-on period.

Losses from motor to wheels may be assumed to be the same for both electric and gasoline motors, as this gives the latter a little the best of it, and in consequence the power actually delivered is measured by the input to the electric motor on the one hand and by the fuel supply to the gas engine on the other. If the cars on

which the two are mounted are similar, energy demands will be equal and costs directly comparable.

For the electric car the input has already been assumed at 1 kw.-hr. per car-mile, which, at thirty-five per cent load factor, could be purchased from any power company for about 0.9 cent, and, including an allowance of 0.6 cent for conversion, the total cost at the car would be 1.5 cent. For an exactly similar gasoline-driven car the energy consumption will also be 1 kw.-hr. per car-mile, or 1.24 hp.-hr. per car-mile. This, multiplied by the previously determined unit fuel consumption of 2.05 lb. per horsepower-hour, produces a car-mile consumption of 2.75 lb. Incidentally, this is the equivalent of 2.1 miles per gallon of gasoline. If the price of gas is taken at the not-unreasonable figure of 22 cents per gallon, the cost per pound of gas would be 3.8 cents. Finally, 2.75 lb. of gas per car-mile at 3.8 cents per pound makes a total cost of 10.5 cents per car-mile for the fuel for the gas-driven car. This is seven times the cost of 1.5 cents for moving the electrically driven car.

A word may be advisable in regard to the editorial on the subject appearing in the last issue of this paper. In this the cost of gasoline fuel "under the most favorable conditions" was cited as being 4 cents per car-mile for a 7-ton car (evidently not a 70-ton car as the linotype made it). Such a figure could be obtained on the assumption of a 16-cent fuel, which we might get, although it doesn't exist yet for automobiles; a forty-second power-on period in a 100-second run, which would correspond to an extremely easy service involving something like three stops per mile; a 20 per cent no-load fuel consumption; and a full-load fuel consumption of 0.8 lb. per horsepower-hour, which figure can be reached by gasoline engines, at least on the test floor. Every one of these conditions is absolutely the most favorable one for the gasoline drive that could be considered as at all reasonable. That all, or in fact that any of such favorable conditions may be expected in commercial operation is highly improbable. In other words, the figures in the editorial gave the electric car the benefit of all doubt.

A word also may be desirable to explain why the above high figures for fuel consumption are not commonly believed to exist in automobile operation. The reason lies in the fact that practically all published statistics for buses hertofore have applied only to conditions involving a negligible frequency of stops and a slow acceleration. Yet the imposition of frequent stops with fast schedules, and the attendant irregular operation of the engine, not only increase the unit fuel consumption of the gasoline motor but also greatly increase the energy input required for the vehicle. Thus, statistics on actual fuel consumption of motor buses published in the ELECTRIC RAILWAY JOURNAL four years ago showed that a number of 4-ton buses generally in suburban operation made 4.5 miles per gallon of gasoline. This would be the equivalent of 2.3 miles per gallon for a 7-ton vehicle such as we have been considering, or say 3 miles per gallon if allowance of 30 per cent is made for the saving in rolling resistance if the vehicle is placed on rails. This compares with the 2.1 miles previously derived for severe city conditions and with the 4 miles derived for most favorable conditions.

In conclusion, it is important that recognition be given to the effect of an increase in cost of power such as that above outlined. For a small car, like the general

FARE BOX REGISTER				10¢ CASH OR ROOKE REGISTER				TICKET REGISTER				DETAIL OF COLLECTIONS			
Reg. No.	Reading	Cash Reg. No.	Reg. No.	READING FRONT	Fares Registered	READING BACK	Fares Registered	Reg. No.	Reading	No. Tickets Reg.	Conductor's Report	For Office Use Only			
	Left			Left		Left		Left			Cash & Ticket Collections	No.	Amount	10¢	
Left	Left			Left		Left		Left			City Zone Day Fares	3.12		3.12	
Left	Left			Left		Left		Left			C. R. Z. D. P. C. C.	3.12		3.12	
Left	Left			Left		Left		Left			C. R. Z. D. P. F. C. (I)	3.12		3.12	
Left	Left			Left		Left		Left			C. R. Z. D. P. F. C. (D)	6		6	
Left	Left			Left		Left		Left			C. R. Z. D. P. F. C. (D)	7		7	
Left	Left			Left		Left		Left			C. R. Z. D. P. F. C. (A)	10		10	
Left	Left			Left		Left		Left			C. R. Z. D. P. F. C. (D)	12.12		12.12	
Left	Left			Left		Left		Left			Papilla Day Int'l Zone	2.83		2.83	
Left	Left			Left		Left		Left			Papilla Day Int'l Zone	2		2	
Left	Left			Left		Left		Left			Papilla Day Int'l Zone	7.1		7.1	
Left	Left			Left		Left		Left			Papilla Day Int'l Zone	10		10	
Left	Left			Left		Left		Left			City Zone Day Papilla	4.12		4.12	
Left	Left			Left		Left		Left			Super Stamp Day Pap				
Left	Left			Left		Left		Left			Exp C. Z. - Beach Sq (Exp)	6		6	
Left	Left			Left		Left		Left			Exp C. Z. - Beach Sq (Exp)	3		3	
Left	Left			Left		Left		Left			L. V. C. Z. - Beach Sq (Ch)	6		6	
Left	Left			Left		Left		Left			Law-Hav C. Z. (Law)	6.52		6.52	
Left	Left			Left		Left		Left			Law-Hav C. Z. (Exp)	3.23		3.23	
Left	Left			Left		Left		Left			Law-Hav C. Z. (Exp)	4.83		4.83	
Left	Left			Left		Left		Left			L. C. T. City Coupon	7		7	
Left	Left			Left		Left		Left			L. C. T. 1 Inter Zone	3.41		3.41	
Left	Left			Left		Left		Left			L. C. T. 1 Inter Zone	7		7	
Left	Left			Left		Left		Left			L. C. T. No. 14 R. Exp Comp	7		7	
Left	Left			Left		Left		Left			L. C. T. No. 14 R. Exp Comp	10.13		10.13	
Left	Left			Left		Left		Left			L. C. T. 3 Inter Zone	10.13		10.13	
Left	Left			Left		Left		Left			L. C. T. Woburn Wk	10.13		10.13	
Left	Left			Left		Left		Left			L. C. T. W. Exp. Reg. (Ch)	3.12		3.12	

BACK OF DAY CARD USED ON THE BAY STATE SYSTEM

type under consideration, earnings of 25 cents per car-mile would be excellent, and with a direct cost of operation (including only power, labor and maintenance) in the vicinity of 10 cents per car-mile, operation would be profitable. If, however, the gasoline drive was introduced, increasing the cost of power by 9 cents, the cars might just as well be taken off the streets, because they would certainly lose money with receipts of 25 cents and a direct operating expense of 19 cents per car mile. If there are certain peculiar attractions and advantages of the gas-driven car sufficient to increase receipts in proportion to any such increased cost of operation, they have not yet been put forward, and no one with common sense believes that they exist. Consequently the electric railway industry can do no better than to dismiss the whole gas-drive insanity from mind—unless, perhaps, the old plan of the motor-bus line promoters should be revived, and the fuel consumption of small gas cars on easy runs be compared with those of large electric cars operating on a severe schedule. In this case an analysis of the conditions should promptly provide the comparison with a place in the waste basket. As for the question of extremely light cars, which naturally would be favored by the supporters of an extremely costly fuel, this is something solely for the car designer. It is up to him to say whether the use of an extremely light car body that will rack itself to pieces in three or four years will pay for itself by its savings in energy during that period. But in any case the form of this energy must be electricity, because that is by far the cheapest form for city service that is now known.

Designs have been prepared for passenger cars to be operated in Saxony and Prussia with Diesel engines as the prime movers and electric drive for the axles. The engines are placed in the middle with passenger bodies at the ends, the total weight of the car, unloaded, being 64 tons.

### Ten-Cent Fares and 7-Cent Tickets

How They Are Being Collected and Registered on the City and Interurban Lines of the Bay State Street Railway

THE Bay State Street Railway is rapidly introducing metal tickets in place of paper tickets and changing its system of collection in accordance with this plan. Its new fare schedule, which was described on page 161 of the issue of this paper for Jan. 18, is briefly as follows:

- City fares**  
The cash fare is 10 cents.  
Five tickets are sold for 35 cents.
- Interurban fares**  
The cash fare for one or two zones is 10 cents and for each additional zone is 5 cents.  
A 7-cent ticket is accepted for a ride within one zone.
- Fare for combined city and interurban ride**  
A passenger traveling from the city zone into one interurban zone, or vice versa, pays 15 cents cash or a 7-cent ticket and 5 cents in cash. Succeeding interurban zones are at the rate of 5 cents each.
- Limited commutation and school tickets**  
The company has abolished its former workmen's tickets, which were sold at reduced rates, but sells limited commutation tickets good for twenty rides. These tickets have separate coupons for the city and interurban rides, are non-transferable and can be used only during the hours at which wage-earners usually go to and from their work. These tickets and the school tickets which are sold at reduced rates are the only paper tickets issued by the company.

BAY STATE STREET RAILWAY CO.										DAY CARD				Date		
Form T1155 50M-2-1919 WALLACE B. DONHAM Receiver										ROUTES RUNNING FROM CITY INTO INTERURBAN TERRITORY				191		
Conductor										Budget No.				Route		
CITY NO.	Specify Terminal Points at Route and Exact Time of Leaving and Arriving			Per Office Use Only	Time Round Trip	Motorist's Starting Stop	Car No.	ACTUAL CASH ON HAND THROUGHOUT TRIP		REGISTRATIONS				City Zone Transfer/Change No.	Interurban Transfer/Change No.	Extension Policy/Change No.
	Starting Point	Time	Dest. Station					Fare Box Reading	Cash On Fare Box	Route Register Reading	Reading Front	Reading Back	No. of Fares			
1	M		M													
	M		M													
	M		M													
1	M		M													
	M		M													
	M		M													
2	M		M													
	M		M													
	M		M													

FRONT OF DAY CARD USED WITH THE NEW SYSTEM OF FARES ON THE BAY STATE SYSTEM. THE BACK IS SHOWN ABOVE

The method of collecting these fares is as follows: Within the city the conductor may receive a 10-cent cash fare, a 7-cent metal ticket, a paper commutation or school ticket, or a transfer. The cash and metal tickets are collected by a Johnson registering fare box which registers coins of 1 cent, 5 cents and 10 cents and the 7-cent metal tickets, which are slightly smaller

### Publicity on Permanency of Prices

THREE typical posters, issued by the National Prosperity Campaign, to direct public thought to the fundamental reasons for the present high prices, are published herewith. A notice of the organization of the committee in charge of this campaign was published



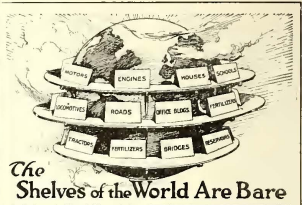
#### AN ACTUAL INCIDENT WITH A BIG MORAL.

A short time ago a farmer sold a buggy manufactured for a price on a certain day which was 20% more than the price of a similar buggy made today. The farmer who sold the buggy today was told that the price of the buggy he had sold was 20% more than the price of a similar buggy made today. The farmer who sold the buggy today was told that the price of the buggy he had sold was 20% more than the price of a similar buggy made today. The farmer who sold the buggy today was told that the price of the buggy he had sold was 20% more than the price of a similar buggy made today.

## Straight Thinking

### Get Busy! Prices Never Will Drop to Pre-War Levels

The general economic condition of the country is such that prices are not likely to drop to pre-war levels. The cost of raw materials, labor, and transportation has increased significantly. The government's policies and the war effort have contributed to these price increases. It is essential for the public to understand the reasons behind these price levels and to accept them as a necessary part of the current economic situation.



The shelves of the world are bare. The war has disrupted the global supply chain, leading to shortages of essential commodities. This has resulted in high prices for goods that were once abundant. The public must understand that these price levels are a direct result of the war's impact on the world economy.

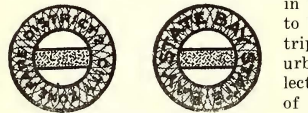
THESE POSTERS EMPHASIZE THE PERMANENCY OF PRESENT PRICE LEVELS

in diameter than a dime. The paper tickets are registered on an overhead register. The transfers are collected by hand and are not registered, and are placed in a trip turn-in envelope and deposited in a locked box in the car. This has to be done every half trip. On the interurban sections, all collections except those of paper tickets are made with a Rooke register which has been designed to take 5-cent pieces and 7-cent tickets. The fare box is also used on the interurban lines to collect nickel fares of passengers boarding the car. The paper tickets are registered on the overhead register.

The interurban cash fares of through passengers are collected, 10 cents at a time, this amount being inserted in the Rooke register as two 5-cent pieces. As this sum entitles a passenger to ride through two zones, each passenger paying this sum receives a hat check which he holds until the fare is collected for the zone in which he desires to alight. A passenger who boards the car in the last half of a 10-cent collection zone receives a hat check of a different color to show he is entitled to ride half way through the next 10-cent collection zone. Conductors check up their car every zone, and passengers not holding proper checks are required to pay regular fares. The interurban zones average 2 miles in length, making the fare about 2½ cents a mile. There are no overlaps. The headings used on the front and back of the standard day card are shown in the blank. A reproduction of the metal ticket is also shown.

in the issue of this paper for April 5. P. H. Gadsden, vice-president United Gas Improvement Company, is chairman, and the other members include many men prominent in business circles. Temporary headquarters have been taken at the Commodore Hotel, New York. The purpose of the campaign is to make more generally clear the changes which have occurred in conditions, commercially, economically and socially, since the war began, and the impossibility of any general return to pre-war prices. In this way, it is believed, business will be encouraged to go ahead, provided there is reasonable certainty that present prices are here to stay, at least so far as general price levels are concerned. Other publications contain excerpts from recent addresses by authorities on the subject of prices and finance. The campaign has a special interest to electric railways because a frequent argument made against fare increases is that the present economic condition is temporary only and that in a short time the old fares will again be adequate. This theory has no firm basis to support it and the publications of the committee for this reason may be of special help to electric railways.

The city of Birmingham, England, is considering the erection of a power plant to care for future needs but is troubled by the difficulty of securing condensing water. The River Severn, 20 miles away, would only be capable of condensing steam from a 100,000-kw. station without cooling towers. An alternative is to erect the station nearer the city, with cooling towers, and to use either the drainage water from the Staffordshire mines or the sewage effluent at Minworth as cooling water. The conclusion has been reached to use the sewage effluent, which will be sufficient for a station of 900,000 kw.



METAL FARE TOKENS USED BY BAY STATE STREET RAILWAY



## Proper Storage Facilities Aid Salvage of Scrap Metal

### The Illinois Traction System Stores and Segregates Its Scrap Metals at a Central Point for Proper Distribution

**T**HE Illinois Traction System in the yards adjacent to the Decatur shops has recently erected storage facilities for all kinds of scrap metal. A 600-mile interurban system such as this necessarily accumulates a great deal of scrap metal, and rather than have this lying around scattered over various parts of the system it is now all brought to this central point and sorted. Any parts that are good for further use are reclaimed and the remainder is sold in carload lots for junk.

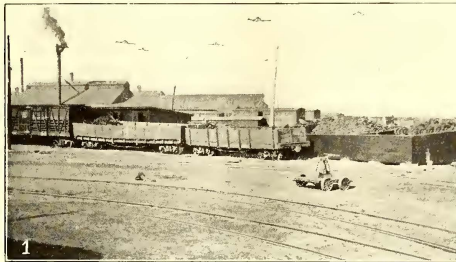
The facilities for handling this scrap material are shown in the accompanying photographs and consist primarily of a building 61 ft. long and 20 ft. wide with an adjoining platform the same width and 120 ft. long. This whole structure is built adjacent to a curved section of switch track.

One end of the building is devoted to the storage of coke, capacity being available for two 80,000-lb. capacity carloads. The coke is shoveled into the building through the four small doors shown in illustration

No. 2, and is taken out through a door at the end of the building. Adjoining the coke room and inside the same building are three other storage bins, one each for steel shavings, foundry ashes and core sand. These materials are dumped into the bins from wheelbarrows through openings at the back as shown in the third view. As the floor of each of these three bins and of the platform beside the building is about level with a car floor, a very gradual incline about 40 in. wide is provided at the back of the building, and up this the barrows are pushed to a horizontal platform about 2 ft. above the bin floors.

The platform adjoining the building is divided by low partitions into five sections in which are stored respectively general scrap iron, all classes of scrap spring material, iron piping, old brakeshoes and broken or worn-out gears and pinions. These materials can be loaded into and unloaded from cars at the front and wheelbarrows at the rear. Holes have been bored in the plank flooring to drain off rain and snow, and a drain below the platform carries this off to the rear of the building. The platform is erected on concrete pier foundations and both the building and platform are side sheathed with matched lumber, the roof of the building being covered with a composition roofing paper.

VIEWS OF THE FACILITIES PROVIDED BY THE ILLINOIS TRACTION SYSTEM FOR THE STORAGE AND SALVAGE OF SCRAP METAL.



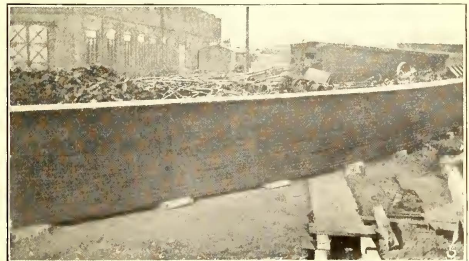
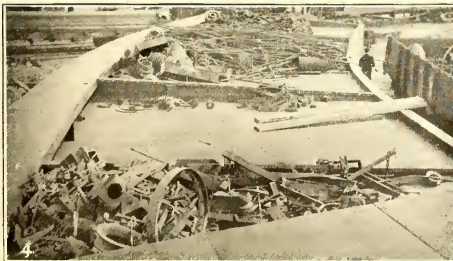
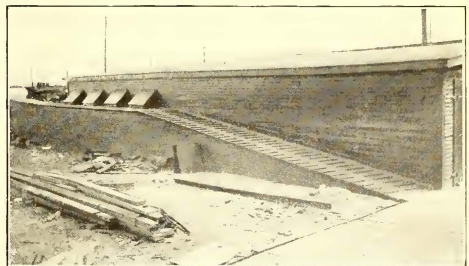
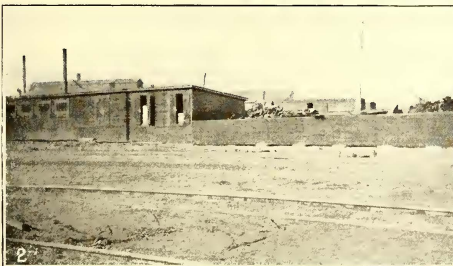
No. 1—Loading scrap materials into coal cars.

No. 2—Front of storage building and platform.

No. 3—Rear of building, showing incline by which the platform is reached with wheelbarrows.

No. 4—Platform on which scrap metals are segregated and stored.

No. 5—Rear of storage platform, showing concrete piers and side sheathing.



## AMERICAN ASSOCIATION NEWS

### Representation at Chamber of Commerce Meeting

PRESIDENT PARDEE has appointed a committee of six delegates to represent the American Electric Railway Association at the meeting of the United States Chamber of Commerce next week in St. Louis and to act with Philip H. Gadsden, National Councillor. The members of the delegation are Walter A. Draper, Cincinnati, Ohio; Britton I. Budd, Chicago, Ill. Richard McCulloch, St. Louis, Mo.; Philip J. Kealy, Kansas City, Mo.; Horace Lowry, Minneapolis, Minn.; Edwin C. Faber, Chicago, Ill.; alternates, Thomas Finigan, Chicago, Ill.; Edward B. Meissner, St. Louis, Mo.; Henry W. Blake, New York. The alternate national councillor is H. H. Crowell, Grand Rapids, Mich.

### Collection and Registration of Fares

THE Transportation & Traffic Association committee on collection and registration of fares met in New York on April 24 and "blocked out" its report to be presented at the fall convention. This report will cover the following points as selected by the executive committee (See E. R. J., Feb. 1, 1919, page 244):

The subject selected for one of the sessions is the collection and registration of fares, particularly fractional fares or fares whose payment involves the collection and registration of two or more coins. It is hoped by the committee that this session will be made a joint session with the Accountants' Association, so that the topic may be considered from both the transportation and accounting standpoints. The committee will be instructed to consider the subject both as regards a uniform and a zone system of fares.

The meeting was attended by W. J. Harvie, Auburn, N. Y., chairman (appointed to take the place of R. R. Anderson, who was unable to serve); L. D. Pellissier, Holyoke, Mass.; C. W. Stocks, Boston, Mass., and L. H. Palmer, Baltimore, Md. (sponsor from executive committee).

The committee outlined the field to be covered, dividing it into two sections, one relating to the flat fare and the other to the fare based upon distance traveled. The former was the only one studied in detail at the meeting. In it were included the collection and registration of single coins, multiple coins, metal tickets and paper tickets by all practicable means. The committee aims ultimately to recommend the most approved plans for these purposes in general and special cases.

### Illumination Meeting at Manila

FAUSTINO J. MASCARDO, chief clerk of the installation and meters department, Manila Electric Railroad & Light Company, was the speaker at the forty-ninth monthly meeting of the local company section held in Manila on March 4. The speaker outlined the general principles to be applied in indoor and outdoor illumination, traced the history of the art, and showed how electrical illumination is superior to others in many ways. A replica of the first electric lamp made by Mr. Edison, furnished by the General Electric Company, was exhibited.

The attendance at the meeting was unusually good,

250 persons being present, and President Van Hoven announced that a large hall would be secured for an early meeting at which a frolic would be the feature. The March 4 meeting was enlivened with music and humorous dialogs. At future meetings there will be a motion picture show, a pillow fight, a tug-of-war and a few boxing bouts. Mr. Van Hoven outlined a very attractive program for the coming month.

### W. R. Holton Explains Employment Work at Chicago Meeting

W. R. HOLTON was the principal speaker at the W. April 15 meeting of the Chicago Elevated Railways company section, his topic being "The History and Functions of the Employment Department." The talk was illustrated by means of lantern slides. The attendance at the meeting was about eighty persons.

The report of the secretary showed a total membership of 191, sixteen having joined during the current year. There was also an enthusiastic talk on the wisdom and duty of subscribing to the Victory bond issue. Among entertainment features were some humorous recitations and songs and an exhibition of athletic work.

### Government Report on Tests for Color Blindness

THE United States Public Health Service announces that color blindness of a degree dangerous in occupations requiring recognition of colored signal lights occurs in 3.1 per cent of the men and 0.7 per cent of the women in every-day life among healthy individuals in America. It has also reached the conclusion that certain commonly used tests for detection are faulty. With a view of remedying this, a bulletin has just been published for distribution among railroads and steamship lines, setting forth the results of the investigations and recommending several important changes in methods of examination now employed.

Color blindness is best detected by testing with colored lights of known spectral composition. It is of great importance to divide the color blind into the dangerously color blind and the harmlessly color blind. This may be done satisfactorily and expeditiously with the Edridge-Green lantern after an understanding is gained of the principles of the test employed.

The Jennings test is criticised, although it is acknowledged to possess certain practical features which render it superior to other tests in certain lines of examination where great accuracy and classification of color defects are not essential. It should not be used for testing sailors or trainmen. Among refractive conditions of the eye, color blindness occurs least frequently in eyes apparently without demonstrable refractive error; it occurs most frequently in eyes showing mixed astigmatism.

Briefly, the report recommends that the following classes of color blind should not be permitted to be sailors or trainmen: (1) Those possessing a color perception containing three or less units; (2) those possessing a greater number of units than three who have the red end of the spectrum so shortened as to prevent the recognition of red light at a distance of 2 miles; and (3) those with a central scotoma for red and green.

# News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

## Insist Upon Wage Payments

Providence Men Threaten to Go Out on Strike Unless Back Pay Is Forthcoming

After Presiding Justice Tanner in the Rhode Island Superior Court had decided during the week ended April 19 that State, town and city taxes had priority over the payment by the receivers of the back pay due the employees of the Rhode Island Company, Providence, under an award of the War Labor Board last October, so many complications arose that the justice reversed his decision in Court on April 23 and ordered the receivers to make payment.

### MEN THREATEN TO STRIKE

The original decision was not regarded as final, as May 1 was set as the date for a further hearing on the subject. As a result of the original decision, however, the street railway men's union decided to vote on the advisability of calling a strike in case the payment of the back wages was refused. At this referendum, taken on April 19, the men decided to empower the officers of the union to call a strike whenever it was deemed expedient.

In the meantime, the officers of the union urged the Governor to have the State waive its priority in payment of franchise taxes due. A similar request was made to Mayor Gainer of Providence. Other cities and towns in the State were also asked to waive their rights. Governor Beekman placed the matter before the Legislature and a bill was passed waiving the State's rights. Similarly, the Aldermen of Providence went on record in like fashion.

The union officers then interjected another complication by insisting that the State and municipalities waive their rights to payments not only of franchise taxes but also to the payment of all real estate and personal property taxes.

### MATTER REFERRED TO COURT

Attorney General Rice and City Solicitor Chase of Providence expressed opinions that such action could be legally taken and they so advised Governor Beekman, who had called a meeting of the representatives of all the towns and cities of the State for April 21. This opinion presented an unexpected phase to the dilemma, and the State and municipal authorities adjourned without taking any definite action, believing that the Court alone could solve the problem.

Although May 1 was the date set for a further hearing on the subject, in view of the circumstances which arose, Presiding Justice Tanner advanced the

date to April 23. Clifford Whipple, attorney for the receivers; John J. Fitzgerald, attorney for the union; Elmer S. Chase, City Solicitor of Providence; Herbert A. Rice, Attorney General of Rhode Island; Eugene A. Kingman, of Edwards & Angell, representing the Pawtucket Street Railway, the Rhode Island Suburban Railway and the other companies whose lines were leased to the Rhode Island Company, and Richard B. Comstock, counsel for certain committees of bondholders, were all heard in behalf of the interests which they represent.

Presiding Justice Tanner then said that the taxes due the State were legally a paramount claim, yet the Court had an equitable power to preserve the property of the railway system as a going concern. He said that he believed it to be for the interests of all parties for the court to exercise that power to the extent of granting the petition of the receivers to pay the claims of back wages.

The total amount due the carmen approximates \$144,000. The receivers will probably make payment by May 1.

## Building Loans for Employees

In order to assist its office employees to build or acquire homes during the present scarcity, George Kidd, general manager of the British Columbia Electric Railway, Vancouver, B. C., has placed \$50,000 at the disposal of the British Columbia Electric Office Employees' Association to be loaned at 6 per cent over a term of twelve years.

The scheme is believed to be one of the first of its kind to be launched in British Columbia, if not in the whole of Canada, and it is already being gladly accepted by the company's employees. In explanation Mr. Kidd said:

My reason for making the proposal was to relieve, as far as possible, our employees from the pressure of high rents, give them homes of their own and thereby induce thrift and interest in their community. Many of them have been inconvenienced as are others, by having the homes they rent sold over their heads. Many others feel that paying out rent year after year without a permanent interest in their home is not desirable.

Some of our employees already had lots, but they had not the wherewithal to build on them unless at high rates of interest, when the monthly charge for principal and interest would be much heavier than rent. It was these that we hoped to help, and in view of the need for more homes we expect that it will induce some of our employees to build.

The disposal of the fund has been placed in the hands of a joint committee composed of representatives of the office employees' association and the management of the company and the committee has allotted the \$50,000. The employees have named their committee through the association executive.

## Highways Transport Plans

Eleven Regional Directors of New Committee Represent Business Interests Primarily

Grosvenor B. Clarkson, Director of the United States Council of National Defense, has announced a reorganization of the Highways Transport Committee to include direct representation from the office of public roads and rural engineering of the Department of Agriculture; the Bureau of Markets of the same department; the Post Office Department, and the Department of Commerce. With this reorganization it is said that close co-operation with the executive departments most vitally interested in matters of highways transportation will be brought about in such a way that the committee will be a clearing house of action for all federal interest concerned.

The committee as reorganized is as follows: John S. Cravens, of the Council of National Defense, chairman; James I. Blakslee, fourth assistant postmaster general; J. M. Goodell, consulting engineer, office of public roads and rural engineering; James H. Collins, investigator in market survey, bureau of markets; R. S. MacElwee, second assistant chief, bureau foreign and domestic commerce; Charles W. Reid, executive secretary; G. B. Clarkson, director of council, ex-officio.

The committee will be assisted by the Highways Transport Committee Advisory Board consisting of William Phelps Eno, Washington, D. C.; Prof. Arthur H. Blanchard, New York; C. A. Musselman, Philadelphia; Raymond Beck, Akron; J. T. Stockton, Chicago.

It is said that the council in addressing itself particularly to the problems growing out of the entrance of the motor truck into the commercial transportation field, will seek to determine just how the motor truck can best be fitted into the nation's existing transportation agencies. Also that it is the policy of the council through its committee to co-operate with all transportation agencies with the view of determining how transportation needs can be served most efficiently, speedily and economically, and to aid in the promotion of motor express lines through territory now served inadequately by the transportation agencies.

The council will, Director Clarkson states, co-operate with the United States Railroad Administration in the study of the short-haul problem, and will also give specialized attention to the relation of the rural motor express to interurban electric railways and waterways traffic, in the interest of all elements concerned.

## Disappointing Legislative Session in New York

### Principal Electric Railway Relief Measure Fails—Work of Legislature Not Satisfactory

The Legislature of New York has ended with a record of very little accomplished and much condemnation from all sides of that little. Nobody seems satisfied, the Democratic Governor least of all. On the one hand the Progressives express disappointment at the results and on the other hand, the Republicans, who were in control, profess not to be pleased. The Governor, aided by a few Republicans that he won over, made a bold fight for his program of social welfare measures, but he was outmaneuvered by the opposition, and went out on only one minor bill.

#### FARE BILL FAILS

There were several measures of much interest to the electric railways on the program, but the outstanding ones were the Carson-Martin fare bill and the plan for changes in Public Service Commission control. The Carson-Martin bill, the purpose of which was set forth in the report of the hearing on the measure in the *ELECTRIC RAILWAY JOURNAL* for March 15, page 542, passed the House, but failed in the Senate. Thus the prospect of relief for the electric railways by action by the Public Service Commissions with respect to increases in fares is precluded. There was much sentiment in favor of the bill, but at almost the closing hours came the charges by Senator Thompson, chairman of the public service committee of the Senate, about a so-called slush fund. These charges, though fully discredited by the testimony presented at the subsequent hearings, probably affected the fate of this measure. In fact, many of the Senators objected to voting on the Carson-Martin fare bill because of the charges.

#### ONE-COMMISSION MEASURE ENACTED

On April 18 the Assembly passed and sent to the Governor for his approval the bills of James F. Foley, Democratic leader of the Senate, providing for a reorganization of the Public Service Commission for the First District of New York into a single-headed commission and creating a rapid transit commissioner, whose duties will be to complete the building of New York's subways.

Governor Smith asked the Legislature to pass measures affecting both of the commissions, but it refused to comply with this request or to accede to the Governor's recommendation that the Public Service Commission for the Second District be reorganized. The Governor will not name the Public Service Commissioner and the Rapid Transit Commissioner until he signs the measures, so the names will not be sent to the Senate for confirmation. Next year, however, the appointments will have to be referred to that body.

Under an emergency message from the Governor the group of tax bills

prepared by the Davenport special tax committee were passed. With the returns from these measures it is hoped to meet the deficit caused by the loss of excise revenue—some \$24,000,000—and the growing cost of government. One of these bills imposes a State income tax, following closely the lines of the federal measure with respect to regulations but much less burdensome in its imposts.

#### MANY INTERPRETATIONS OF "BLUE SKY"

The Foley "blue sky" bill passed the Senate unanimously, but died in the Assembly. It provided that before any stocks or securities could be sold in the promotion of a corporation a verified statement must be filed with the Secretary of State setting forth all the money paid as commission and other information to prevent the launching of fraudulent ventures. It seems to be generally agreed that some measure of this kind is needed, but the task proved too great of reconciling all the divergent interests that would come within the purview of legislation of this kind. Everybody is agreed that there should be legislation of this kind wisely administered, but there are many kinds of thought on what is wise and what unwise. In view of the failure of this program the financial sharks appear to be in for another period of immunity in which to carry on their nefarious practices.

#### CONDUCTORETTE BILL DEAD

The Senate killed the "so-called" conductorette bill, leaving the measure regulating the employment of elevator women the only measure on the Governor's "social welfare" program to go through.

#### Los Angeles, Oakland and Sacramento Wages Increased

Wage increases were awarded by the National War Labor Board on April 11 to employees of the Los Angeles (Cal.) Railway Corporation, the San Francisco-Oakland Terminal Railways, Oakland, Cal., and the Pacific Gas & Electric Company, Sacramento. Requests of employees of the San Francisco-Oakland Terminal Railways, the San Diego Company and the Los Angeles Corporation for an eight-hour day, and of the workers of the Pacific Gas & Electric Company for a nine-hour day were refused by the board.

The board recommended that motormen and conductors of the Los Angeles company be granted wages of 41 cents an hour for the first three months' employed, 43 cents an hour for the next nine months, and 45 cents an hour thereafter.

The board awarded employees of the San Francisco-Oakland Terminal Rail-

ways a scale ranging from 43 cents to 50 cents an hour. The increase included in the scale is retroactive to Nov. 1, 1918, and payable before Sept. 1, 1919. Time and a half was awarded by the board to trainmen who are called upon to perform extra work.

For employees of the Pacific Gas & Electric Company the board recommended a new wage scale granting conductors and motormen wages ranging from 42 cents to 46 cents an hour with the stipulation that operators who are assigned by the company to run one-man cars should receive an additional 5 cents an hour.

The award is retroactive as of Jan. 1, 1919, with back payments under it due before next June 1. Trainmen are granted time and a half for overtime under the conditions of the award.

The raises granted amount to a 14 per cent wage increase for the platform men of the Traction and Key Route divisions of the San Francisco-Oakland Terminal Railways. The rate per hour for employees of the San Francisco-Oakland Terminal Railways under the award as compared with the old scale is:

TRACTION DIVISION			
	Old, Cents	Award, Cents	
First three months	38	43	
Next nine months	40	46	
Thereafter	42	48	

KEY SYSTEM			
	Old, Cents	Award, Cents	
First year	43	First three months 45	
Second year	44	Next nine months 48	
Third year	45	Thereafter 50	

#### Wheeling Proceeding to Reconstruction

The West Penn Traction Company, Pittsburgh, Pa., controlling the Wheeling Traction System, operating between Moundsville, W. a., and Steubenville, Ohio, will locate its central carhouse and machine shop in South Warwood, near Wheeling. The buildings will cover a space of 10 acres.

When the Wheeling lines were in the hands of the Kuhn interests, Warwood was under consideration as a site for the carhouses and shops. Ten lots were afterward purchased in North Warwood for the carhouse, but residents objected to the location of the plant and the shops were never erected.

The original brick structure housing the cars is at Beech Bottom. With the construction of the new carhouse and shops, Warwood will be a convenient home for the workmen in the shops and for the conductors and motormen on the Pan Handle line. The city of Wheeling, centrally located, will soon have suburban lines running in all directions and connecting with Columbus, Cleveland, Cincinnati and Pittsburgh.

Anticipating this development, it has been arranged to provide for larger carhouses and shops for the company. Hence the location of the new works at Warwood.

**Wages Advanced in San Francisco**

The Board of Public Works of San Francisco, Cal., on April 16 recommended an increase of pay for motormen and conductors of the Municipal Railway of 50 cents a day. That means an increase from \$4 to \$4.50 for eight hours. The new rate was made effective as of April 15. This recommendation was made with the understanding that if the net income of the railway is insufficient to meet this added expense the difference is to be made up from the depreciation fund. There is now about \$1,000,000 in cash in the depreciation reserve fund. About \$1,000,000 has already been extracted from this fund for extensions.

The United Railroads, San Francisco, with which the Municipal Railway is in competition, has just established a new wage scale for platform men, effective from April 13. This supersedes the old scale, which ranged from 37 cents to 45 cents. Both old and new scales involve a ten-hour basis. The new scale is as follows: First six months, 42 cents; second six months, 44 cents; second year, 46 cents; third year and thereafter, 48 cents.

**Missouri Industries Organize**

The Associated Industries of Missouri, representing the combined industrial and manufacturing interests of the State, was organized in Kansas City on April 14 for the protection of the interests of manufacturers and of the industries in general. It proposes to encourage new industries and capital. Railroad development will be one of the particular things advanced.

One of the prime considerations will be the promotion of co-operative relations between employers and employees. The chief interest of the association will be to make Missouri the strongest industrial state in the Union. The organization is based upon the plan of the Illinois Manufacturers' Association. P. J. Kealy, president of the Kansas City Railways, was one of the organizers.

These officers were elected: President, A. J. Davis, president of the St. Louis Employers' Association, St. Louis; first vice-president, Conrad Mann, president of the Kansas City Brewery Company; second vice-president, C. A. Batterall, wholesale shoes, St. Joseph; third vice-president, W. J. Dysart, Springfield; treasurer, John S. Green, St. Louis; secretary, W. C. Rogers, St. Louis.

**Kansas City Elevated Doomed**

The old west bottom elevated railway is doomed if the two Kansas Cities will agree to it. For years surface cars have run over it from Kansas City, Mo., to Kansas City, Kan., or what in former days was known as Wyandotte. It has been in service for years, but has deteriorated very much. Now the Kansas City Railways has asked the City Councils of the two cit-

ies to allow the section between Mulberry and the West line to be demolished. Kansas City, Mo., has acquiesced and it is now up to the Kansas side. The railway would like to tear the structure down because in its present condition it is considered a source of danger. That portion passing over the railroad tracks, however, would be retained. Should Kansas City, Kan., agree to the request, cars from Missouri would pass through the tunnel, and later drop easily to a surface track. The change would bring better service. The two cities would have better accommodations over the new Inter-City Viaduct.

**What's in a Name?**

The proposal of Frank Hedley, vice-president and general manager of the Interborough Rapid Transit Company, New York, N. Y., to claim for his company the exclusive right to use the designation "subway" has provoked no end of comment in the daily press of New York. The merits of the issue aside, much that is petty and witty has been tossed off by the paragraphers. Mr. Hedley is in complete accord with Shakespeare in the sentiment that "the that filches from me my good name steals that which not enriches him and makes me poor indeed." The New York Herald said:

Mr. Hedley proposes that his company shall have the exclusive right to the word "Subway," and that all other companies shall have an otherwise unrestricted choice from a voluminous dictionary. Could anything be more generous? Or, if other traction chiefs need do is to lay hold of a phrase, introduce one or more capital letters, and the deed is done. Or, if so inclined, they might invent a word to suit their case and get a no-respess copyright for it. For instance, the "Walloway," the "Lowline," the "Belowline," the "Underway," the "Holloway," the "Concavity," the "Trough," the "Dipway," the "Lacuna," the "Sink," and over so many others might be suggested. But we warn Mr. Hedley and all the other nomenclators that the public frequently appropriates the right to give names to public utilities of everyday use. From its decisions there is no appeal. It will name the new Interborough lines and all the other lines according as it thinks they should be characterized.

**Wages and Fares Coupled in Chicago**

The attitude of the board of operation of the Chicago (Ill.) Surface Lines, as reported to the employees' organization on April 17, is that a continuation of the wage scale established by the War Labor Board is dependent upon the company procuring the increase in fares which has been asked of the State Utilities Commission. This statement was made in answer to an appeal of the employees for protection against a reduction in the wage scale at the end of the war.

L. A. Busby, president of the company, made it plain in his letter that the choice is between a higher fare, lower wages and a receiver for the properties. He said:

"We agree with you that it is unfair to ask you as employees to bear part of the unjust burden of attempting to maintain our present service at less than the cost. We believe you will agree with us that it

is also unfair to ask the companies to continue under present conditions to pay the present wage scale, which was granted upon the recommendation that an adequate increase in fares should follow.

There have been various rumors about the position to be taken by the State commission on the fare appeal. These were mostly to the effect that the commission would insist on reducing the capitalization on which a return is to be allowed. None of these reports has been confirmed.

**Cleveland-Youngstown Line Assured**

Bankers have announced that the Van Sweringen line, the Cleveland & Youngstown Railroad, will be completed between Shaker Village and East Thirtieth Street, Cleveland, Ohio, by early fall. Finances, they said, had all been arranged, but this could not be confirmed, as O. P. and M. J. Van Sweringen are out of the city.

The line will come down Kingsbury Run in the city and at East Thirtieth Street will connect with one of the Cleveland Railway lines, over which cars will be routed to the Public Square or some other turning point until the proposed new union station is completed.

The Cleveland Railway is now operating cars over what is known as the Shaker Boulevard line. One of the branches to be completed is the South Moreland. The new line will furnish rapid transit service to a large residential territory and make further real estate development possible on the heights southeast of the city proper.

**New Investment Bankers' Committees**

O. B. Willcox, vice-president Bonbright & Company, New York, and chairman of the committee on public service securities of the Investment Bankers' Association of America, has announced the appointment of the following sub-committees:

- Street Railways and the Investor's Interest:**  
 Russell Robb, chairman, Stone & Webster, Boston.  
 G. M. Dahl, Chase Securities Corporation, New York.  
 Claude K. Boettcher, Boettcher, Porter & Company, Denver.  
 R. Lancaster Williams, Middendorf, Williams & Company, Baltimore.  
**Canadian Public Service Securities:**  
 R. B. Young, chairman, E. H. Rollins & Sons, Boston.  
 J. A. Fraser, Dominion Securities Corporation, Toronto.  
 James C. Willson, James C. Willson & Company, Louisville.  
 Chester Corey, Harris Trust & Savings Bank, Chicago.  
**Public and Municipal Ownership from the Investor's Standpoint:**  
 R. Lancaster Williams, chairman, Middendorf, Williams & Company, Baltimore.  
 F. E. Frothingham, Coffin & Burr, Inc., Boston.  
 James S. Riley, Perrin, Drake & Riley, Inc., Los Angeles.  
 Claude K. Boettcher, Boettcher, Porter & Company, Denver.  
**Credit and Financing of Public Service Companies, Including Cost of Money:**  
 Chester Corey, chairman, Harris Trust & Savings Bank, Chicago.  
 James S. Riley, Perrin, Drake & Riley, Inc., Los Angeles.  
 Russell Robb, Stone & Webster, Boston.  
 F. E. Frothingham, Coffin & Burr, Inc., Boston.  
 G. M. Dahl, Chase Securities Corporation, New York.

## News Notes

**Newark Jitney Men Will Organize.**—The jitney owners representing every line in Newark, N. J., and all lines to the suburbs, with the exception of Kearny, met in Newark on April 16 and, after a long discussion, decided to form an organization to protect their interests. A man from each of the lines was chosen to organize his fellows. Another general meeting will be held at which plans will probably be worked out looking toward a permanent organization.

**Another Attempt at Norfolk Franchise.**—The tentative draft of the new franchise to be submitted to the Virginia Railway & Power Company has been completed by attorneys for the city of Norfolk, Va., and forwarded to the officials of the company at Richmond. The franchise will take the place of the various franchises under which the company is operating at present. It extends the time on all and is said to give the city authorities increased power of regulation. After officials of the company have had time to study carefully the provision suggested by the city a joint conference will be held.

**Seattle Elevated Tested.**—Thomas F. Murphine, Superintendent of Utilities of Seattle, Wash., recently authorized the operation of a street car over the new municipal elevated railroad, to test the structure. He did this following a request of City Engineer A. H. Dimock. The special work for the connection of the surface and elevated lines at First Avenue and Washington Street is now being made, and it is expected will be ready in two weeks. When completed, the west side cars will be routed over the elevated, cutting down the running time fifteen to twenty minutes.

**Wants Municipal Line Taxed.**—The Chamber of Commerce, Seattle, Wash., in a recent communication to the City Council, urged that the municipal railway system be charged with the taxes formerly paid on railway property by the Puget Sound Traction, Light & Power Company, pointing out that unless other arrangements are made, these taxes will be charged against the general property owner. It is suggested that the utility should be charged with \$300,000 general and \$90,000 gross revenue tax, the same as the private corporation. Members of the utilities committee and the City Council are said to be against the proposal as presented.

**Dismissed for Lack of Jurisdiction.**—The appeal of the employees of the St. Paul (Minn.) City Railway against

the Twin City Rapid Transit Company for increased pay has been dismissed by the National War Labor Board for lack of jurisdiction. The decision read: "It appearing the complainants have failed and neglected for more than two months to take any steps toward final prosecution of this case and that their attention has been called to the necessity of taking active steps in the matter, and that reasonable opportunity was given them to do it, therefore it is hereby directed that said case be dismissed without prejudice for want of jurisdiction."

**Preparing Wheeling Wage Demands.**—The executive committee representing employees of the West Virginia Traction & Electric Company, the Pan Handle Traction Company, the City Railway and the Wheeling (W. Va.) Traction Company has been holding a series of meetings at Wheeling to consider wage and other conditions to be inserted in the contract to be presented to the management of the companies for joint action by the men and the railway officials. The men will probably ask for a considerable increase in wages. It is expected that the attitude of the railways will be that they must have additional revenue, to be derived from increased fares, if they are to be called upon to increase wages.

**Portland Men Want More.**—Trainmen of the Portland Railway, Light & Power Company, Portland, Ore., are reopening the question of wages, demanding increases that amount to about 10 cents an hour. The present wages are 46, 48 and 50 cents an hour. The new demands call for 55, 58 and 60 cents. When the question of wages for railway workers was adjudicated by the War Labor Board last October, it was stipulated that either the employing company or employees might reopen the matter at six-month intervals. April 1 marked the first date on which negotiations for a change in scale might be started anew. Franklin T. Griffith, president of the company, states that it cannot consider making wage increases at this time. It is said this will mean that the matter will again go before the War Labor Board for adjustment.

**Pasadena Defeats Municipal Ownership.**—Pasadena, Cal., seems to have had its fill of municipal ownership. It already owns the local electric light plant and the water system, and had in contemplation the construction of a high-speed municipal electric railway between the city and Los Angeles. That project, however, was abruptly halted by being voted down at the election on April 3. The project was ambitious. It called for an issue of \$3,000,000 of bonds, with mere construction costs for the new line placed at \$2,777,107. These were regarded as big figures for Pasadena. Proponents of the measure insist that the vote must be taken as a repudiation of this particular project and not as a rebuke to municipal ownership as such, particularly in view of the excellent facil-

ities afforded by the Pacific Electric Railway for communication between the cities.

**Appointments to Seattle Legal Department.**—Walter F. Meier, Corporation Counsel of Seattle, Wash., has appointed several new members of his department, to assist in the municipal railway legal work. Every appointment has been given to men who have had overseas experience, or who have been engaged in war work. Capt. Ewing Colvin and Capt. Nelson T. Hartson have been appointed assistants to the Corporation Counsel, to fill vacancies caused by the transfer of two members of the department to handle the legal end of the railway claims and personal injury cases. Three appointments have also been announced by Counsel Meier to the railway claim department. Although the Council made appropriation for salaries for several other positions in the legal department, Corporation Counsel Meier said he will not make appointments until an increase in business necessitated them.

**Sounds a M. O. Warning.**—In a report of the bureau of taxation of the Seattle Chamber of Commerce and Commercial Club, attention is called to the obligation of the city government to conduct the municipal electric railway at a profit and turn into the general fund an amount sufficient to offset the loss of approximately \$400,000 of taxes and franchise revenues which would be paid by the system under private ownership. In concluding its statement the bureau says: "Unless the railway system is so conducted as to furnish the necessary service without increasing the tax rate, the property owners of the city, including the owners of homes and industrial plants, will be called upon to help pay part of the transportation expense of the general public in addition to their own, and investment of outside capital in Seattle, essential to our rapid development, will be made more difficult to secure by increase in a tax rate already high."

**M. O. Defeated in Sioux Falls.**—With the re-election of Mayor G. W. Burnside, after serving sixteen years, the special submissions of purchase of the local railway lines and the gas company property were defeated. The attitude of Roger Mills, secretary and manager of the Sioux Falls (S. D.) Traction System, toward municipal ownership was noted in the *ELECTRIC RAILWAY JOURNAL* for April 19, page 807. There was no quibbling by the local railway as to where it stood. In one advertisement during the campaign the company, which by the way used space very liberally, said bluntly: "More lines, more cars, more paving and more frequent service are financially out of the question with us at the present time. If this is what the people of Sioux Falls demand, then you should vote 'Yes' at the coming election. Your vote against the proposition is an indorsement of the present management, the rate of fare and the service that we are giving you."

# Financial and Corporate

## Planning Spokane Merger

After Several Years of Discussion Ordinance Is Being Drawn with This End in View

The general terms of a proposed ordinance to be submitted to a vote in Spokane, Wash., for a franchise under which the local lines of the Washington Water Power Company and the Spokane Traction Company, which is included in the Spokane & Inland Empire Railroad, will be consolidated have been agreed upon by the officials of the companies.

### MR. HUNTINGTON THE VEHICLE

Under the tentative plan approved by counsel for both companies, to be submitted to Mayor Fassett and the City Commissioners soon, the preamble will read: "To grant to D. L. Huntington, his heirs and assigns the right to build, equip, purchase, own and operate a single or double-track electric railway system upon certain streets in the city of Spokane."

Mr. Huntington in turn will agree to organize immediately a corporation to acquire the present railway systems of the Washington Water Power Company and the Spokane & Inland Empire Railroad, merge them and eliminate certain trackage.

It is further to be provided that the city charter will be so amended as to relieve the railway systems from certain burdens of expense in the way of paving, bridge taxes and other compensations to the city.

Mr. Huntington will be allowed a stipulated number of months in which to accept the ordinance and meet the requirements of its various provisions. The acceptance of the ordinance by Mr. Huntington will terminate all other ordinances and franchises previously granted both companies. In a general way the proposed ordinance will follow the provisions of the last franchise granted the Washington Water Power Company by the city in 1910.

### FARES TO BE SUBJECT TO REGULATION

In the ordinance submitted by the companies, as now considered, there will be no reference to the precise streets upon which the franchise to operate cars will be granted, but the list of streets will be left to the City Council and the Mayor to designate in a supplemental ordinance as an amendment to the proposed ordinance of the carriers.

The rates of fare to be charged are to be fair, just and reasonable and subject to regulation in the manner provided by law.

The matter of universal transfers is to be stipulated free from extra cost except that the transfer will not be given on a parallel line less than six

blocks away from the car upon which the passenger is riding. The charge for a transfer in this case, if one is demanded by the passenger, is to be fair, just and reasonable and subject to regulation in the manner prescribed by law. Members of the fire and police department in uniform are to be carried free.

The franchise will run for twenty-five years from the date of acceptance.

A rough draft of the proposed franchise has been prepared by Frank T. Post, counsel for the Washington Water Power Company, and Ben. F. Kizer, representing the Spokane & Inland Empire Railroad, and informal conferences have been held by the officials of the companies.

## Looking Into Future

Frederick J. H. Kracke, a member of the Public Service Commission for the First District of New York, estimates that before 1950, New York City will require to transport its population a rapid transit and street railroad system four times as great as at present. Mr. Kracke bases his estimate upon a careful analysis of traffic figures covering the last fifty-nine years in New York, and upon municipal population statistics for a still longer period.

The population of Greater New York in 1950, Mr. Kracke estimates, will be 12,556,106 persons, and the passenger traffic upon elevated, subway and street surface lines, if some new transportation method is not devised in the meantime, will be more than 8,000,000,000 persons annually. These computations are based upon an estimated population of 5,525,497 persons in New York City at the close of the fiscal year 1917-1918 in which period about 1,975,511,709 passengers were carried on the traction lines. This would indicate that more than 2,000,000 passengers will use local transit facilities during the current fiscal year. The rate of growth of traffic is much greater than the rate of increase in population. While the population has grown 26 per cent to 39 per cent a decade, ratios for street railroad passengers have increased from 49 per cent to 200 per cent.

These conclusions are contained in an opinion by Commissioner Kracke, in which the Belt Line Railway Corporation is authorized to abandon certain of its unused or little used tracks. In authorizing this abandonment Mr. Kracke points out that if the vast and growing population in New York is properly to be cared for from the transportation standpoint, useless and outworn lines must be abandoned and the companies relieved of their maintenance in order that funds may be concentrated upon the development of facilities much more useful and beneficial.

## Bay State Property Sold

955-Mile Electric Railway System Sold Under the Hammer to the Reorganization Committee

The property of the Bay State Street Railway, Boston, Mass., which company operates in ninety cities and towns in eastern and southeastern Massachusetts and extends into New Hampshire and Rhode Island, was sold at auction on April 21 at Salem, Mass., by order of the Federal Court, under the reorganization plan by which the property is eventually to be in the hands of the Eastern Massachusetts Railway, and managed by five public trustees provided for by a special act of the Legislature.

### BANKER THE PURCHASER

The purchaser was Arthur I. Gidden, representing Lee, Higginson & Company, Boston, Mass., reorganization managers for the railway, and the price was \$3,000,000, subject to the taking over of various obligations, including those of the Bay State receivership and mortgages of the Boston & Northern Street Railway and the Old Colony Street Railway.

The reorganization plan provides for \$3,582,633 of new cash from stockholders and scaling down \$20,000,000 of capitalization to conform to the public control act. Its terms were reviewed in the ELECTRIC RAILWAY JOURNAL for March 15, page 538. Briefly the total of securities of the successor company bearing fixed charges will be \$29,352,700 while the grand total of capitalization will be \$52,396,950, the difference between these sums being made up by \$4,097,000 of preferred stock and sinking fund stock, \$2,998,500 of new preferred "B" stock, \$8,719,000 of new adjustment stock (cumulative) and \$7,229,750 of new common stock.

The plan of reorganization, when put into effect, will permit the acceptance of the special legislative act of 1918. The trustees will have absolute power to fix fares sufficient to pay a return covering all interest requirements, the stated dividends on the preferred stocks and 6 per cent on the common stock of the new company. Based upon the Public Service Commission's appraisal of \$40,282,340 in its decision of Aug. 31, 1916, plus subsequent additions, the property valuation will be about \$46,000,000, on which \$2,760,000 is the approximate amount of the permitted initial annual return.

### STATE'S CREDIT PLEDGED

The credit of the State is pledged for the payment of the principal of not exceeding \$4,000,000 of serial mortgage bonds of the new company maturing within ten years from the date of issuance. The act requires that \$2,500,000 of these bonds be sold immediately so as to produce \$2,500,000 cash, of which \$2,000,000 must be used for future additions and improvements and \$500,000 set aside as a reserve fund; and that \$1,000,000 of cash additional

must be realized from the sale of other securities of the new company and applied to the rehabilitation of the properties or to other corporate purposes. This makes a total of \$3,500,000 of new cash which must be obtained, as a prerequisite to the formation of the new company under the act.

The proposed capitalization of the new company conforms to the act, so that the permitted return will always be sufficient to pay all fixed charges and regular dividends.

## Readjustment in Indianapolis

Proposal Toward That End Now Before Committee of Stockholders of the Indianapolis Street Railway

The appointment of a committee of fifteen stockholders of the Indianapolis (Ind.) Street Railway to report on May 8 on a plan in harmony with the suggestions of the Indiana Public Service Commission's order of Dec. 28, 1918, in so far as the same may be practicable and feasible, is regarded as the first step toward the financial readjustment of local Indianapolis lines which the Indiana Public Service Commission directed to be made when it issued an order allowing the company to charge a 5-cent fare.

The order was made in the case of the Indianapolis Traction & Terminal Company, which holds a lease of and operates the property of the Indianapolis Street Railway. Following this order the Indianapolis Traction & Terminal Company postponed the payment of interest on the \$6,000,000 of Indianapolis Street Railway bonds when the interest fell due on Jan. 1, 1919. It did, however, pay the semi-annual lease rental, or dividend of \$150,000, to the Indianapolis Street Railway. Under the provisions of the mortgage securing the bonds there are six months of grace, which will end on July 1.

This committee was appointed at the annual meeting of the stockholders of the Indianapolis Street Railway held on April 10. The committee is composed of J. F. Wild, Edward L. McKee, Walter J. Ball, R. K. Willman, John W. Smith, Frank Donner, H. W. Bennett, Robert Elliott, George C. Hitt, W. A. Hough, Otto N. Frenzel, Samuel Reid, Samuel T. Murdock, M. J. Ready and H. H. Hornbrook.

The membership of this committee can be increased to include any large stockholder of the Indianapolis Street Railway. The directors were re-elected, as follows: Henry Jameson, Indianapolis; John W. Smith, Muncie; Harold J. Hibben, Indianapolis; Winfield T. Durbin, Anderson; Walter J. Ball, Lafayette; Charles M. Murdock, Lafayette, and Joseph A. McGowan, Indianapolis.

The above stockholders' committee has appointed a sub-committee, composed of Messrs. Wild, Willman, Frenzel, Murdock and Ball, to draft plans embodying the suggestions contained in the Public Service Commission's order of Dec. 28, 1918.

## Statistics for January

Comparative Figures for 1919 and 1918 in a New Form Show How Cost of Doing Business Has Risen

Operating statistics of electric railways reporting monthly to the information bureau of the American Electric Railway Association are given in the accompanying tables in a somewhat different form than that used heretofore.

Table I shows the income statement and car-miles for fifty-nine companies for January, 1919, as compared with January, 1918. Formerly only the revenues, expenses, net taxes and operating income were shown. Table II is also an operating statement, but in this case the amounts per car-mile are given. The companies represented are the same as those in Table I.

Table III is a detailed statement of the operating expenses of fifty-five companies. In Table IV the amounts per car-mile of the operating expenses shown in Table III are presented.

Tables V, VI, VII and VIII correspond respectively to Tables I, II, III and IV and give the operating statement and detailed operating expenses, for January, 1919, of 105 companies. Tables V and VII give the actual totals, while Tables VI and VIII give the same amounts per car-mile. The companies shown include those appearing in the first four tables and in addition forty-six others for which the 1918 figures were not available.

### BEST SHOWING IN SOUTH

As in the past, the returns from city and interurban electric railway companies 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.

The operating statement in Table II indicates that the Eastern district was the only one to improve its condition. The good showing made in this district, however, was probably due more to the unfavorable conditions in 1918 caused by the heavy winter weather than to any actual improvement in operating conditions in 1919.

The Western district seems to be going from bad to worse. The balance after the payment of taxes and fixed charges dropped from a net income of 1.02 cents per car-mile in 1918 to a deficit of 0.10 cent per car-mile in 1919. An increase of 21.86 per cent in operating expenses and nearly 18.00 per cent in taxes were largely responsible for the poor showing made.

### SOUTH LOSING GROUND

In the South conditions are slowly becoming worse. Operating expenses increased 31.82 per cent, and the net revenue fell off 3.82 per cent. Taxes increased 16.30 per cent, and although the fixed charges decreased 7.45 per cent the net income dropped from 3.77

cents per car-mile to 3.11 cents in 1919, a decline of 17.51 per cent.

Although the Southern district seems to be losing ground, as shown above, it still makes by far the best showing of the three districts. The net income of 3.11 cents per car-mile compares very favorably with 0.08 cents per car-mile in the East and a deficit of 0.10 cents per car-mile in the West.

### OPERATING EXPENSES JUMPED

The details of operating expenses given in Table IV help to explain the depressing situation reflected in the previous tables. Practically every account shows a large increase since January, 1918. The decisions of the War Labor Board are reflected in the increase in conducting transportation, which for the country as a whole rose from 9.51 cents per car-mile in January, 1918, to 12.23 cents per car-mile in January, 1919, an increase of 28.60 per cent. The greatest increase in this item is shown in the South, 38.08 per cent, while the highest actual figure per car-mile appears in the East, 13.49 cents, and the lowest in the West, 10.58 cents.

The cost of power shows an increase for the country as a whole of 12.97 per cent, rising from 4.24 cents per car-mile in January, 1918, to 4.79 cents per car-mile in January, 1919. This, of course, reflects the rise in the price of coal and the higher wages of labor. The Western district shows the greatest increase in this account, 44.64 per cent compared with an increase of 2.90 per cent in the East and a decrease of 1.34 per cent in the South. The favorable showing of the East and South in this respect is probably due to the storms of 1918 in the East which reduced the output and increased the cost per car-mile, while the increased cost in the West is partially explained by the great amount of haulage necessary at the increased freight rates.

### MAINTENANCE INCREASES HEAVY

The maintenance of way and structures and equipment shows heavy increases, reflecting the high cost of materials and also the high wages prevailing. For the country as a whole the way and structures account increased 12.98 per cent and the equipment account 25.18 per cent. The greatest increase in these accounts was in the South, being 50.62 per cent and 61.18 per cent respectively. The actual expenditure per car-mile for equipment was, however, less in the South than in the other districts, being 2.74 cents per car-mile as compared with 3.08 cents per car-mile in the West and 4.28 cents in the East. For way and structures the actual expenditure per car-mile was 3.84 cents in the East, 2.44 cents in the South and 2.22 cents in the West.



TABLE I—INCOME STATEMENT FOR FIFTY-NINE ELECTRIC RAILWAYS FOR JANUARY, 1919, COMPARED WITH JANUARY, 1918

	United States		East		South		West	
	1919	1918	1919	1918	1919	1918	1919	1918
Railway operating revenues.....	\$8,242,651	\$7,220,956	\$3,330,226	\$2,983,510	\$1,204,345	946,735	\$3,708,080	\$3,290,711
Railway operating expenses.....	6,464,859	5,398,330	2,766,909	2,471,011	860,183	611,505	2,831,767	2,315,814
Net operating revenue.....	1,777,692	1,822,626	563,317	512,499	344,162	335,230	876,313	974,897
Net revenue from auxiliary operations.....	17,412	4,927	480	.....	.....	.....	16,932	4,927
Taxes.....	564,858	507,505	197,747	202,758	121,770	97,935	245,341	206,812
Operating income.....	1,222,844	1,320,626	365,050	309,741	216,392	237,295	647,904	773,012
Non-operating income.....	402,984	393,036	169,226	156,939	192,740	197,461	41,018	38,636
Gross income or loss.....	1,632,230	1,713,084	535,312	466,680	409,032	434,756	688,922	811,648
Deductions from gross income.....	1,524,019	1,522,600	527,988	525,990	296,708	300,430	699,323	696,800
Net income or loss.....	108,211	168,384	7,324	40,690	112,324	134,326	10,601	115,848
Car-miles operated.....	23,560,028	23,404,022	8,482,909	8,606,460	3,789,862	3,551,712	11,287,511	11,245,850

TABLE II—INCOME STATEMENT IN CENTS PER CAR-MILE FOR FIFTY-NINE ELECTRIC RAILWAYS SHOWN IN TABLE I FOR JANUARY 1919, COMPARED WITH JANUARY, 1918

	United States			East			South			West		
	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase
Railway operating revenues.....	34.99	30.85	13.42	39.25	34.67	13.21	31.77	26.65	19.21	32.85	29.26	12.27
Railway operating expenses.....	27.44	23.07	18.94	32.62	28.71	13.62	22.70	17.22	31.82	25.09	20.59	21.86
Net operating revenue.....	7.55	7.78	2.96	6.63	5.96	11.24	9.07	9.43	3.82	7.76	8.67	10.60
Net revenue from auxiliary operations.....	0.07	0.02	250.00	0.01	.....	.....	.....	.....	0.15	0.04	275.00	.....
Taxes.....	2.40	2.17	10.60	2.33	2.36	7.27	3.21	2.76	16.30	2.17	1.84	17.95
Operating income.....	5.22	5.63	7.39	4.31	3.60	19.72	5.86	6.67	12.17	5.74	3.87	26.15
Non-operating income.....	1.71	1.68	1.79	1.99	1.82	9.34	5.08	5.56	8.73	0.36	0.34	5.88
Gross income or loss.....	6.93	7.31	5.20	6.30	5.42	16.24	10.94	12.23	10.55	6.10	7.21	15.40
Deductions from gross income.....	6.47	6.51	0.62	6.22	6.11	1.80	7.83	8.46	7.15	6.20	6.19	0.16
Net income or loss.....	0.46	0.80	43.50	0.08	0.69	.....	3.11	3.77	17.61	0.10	1.02	109.80
Car-miles operated.....	23,560,028	23,404,022	0.68	8,482,909	8,606,460	7.44	3,789,862	3,551,712	6.70	11,287,511	11,245,850	0.36

TABLE III—OPERATING EXPENSES OF FIFTY-FIVE ELECTRIC RAILWAYS FOR JANUARY, 1919, COMPARED WITH JANUARY, 1918

	United States		East		South		West	
	1919	1918	1919	1918	1919	1918	1919	1918
Operating expenses.....	\$6,397,528	\$5,293,975	\$3,264,609	\$3,282,288	\$957,287	\$675,563	\$2,032,983	\$1,690,601
Way and structures.....	695,633	617,275	387,334	404,433	103,546	67,333	204,753	145,509
Equipment.....	831,185	662,452	431,911	395,362	116,578	70,568	284,696	196,522
Power.....	1,128,013	996,471	672,078	627,716	62,631	61,701	386,285	266,254
Conducting transportation.....	2,876,983	2,234,926	1,359,810	1,082,179	538,965	381,704	978,208	771,043
Traffic.....	36,491	43,297	11,101	11,172	10,538	3,099	14,852	29,026
General and miscellaneous.....	827,364	739,354	394,899	359,949	125,009	93,588	307,286	262,949
Transportation for investment—Cr.....	141	64	64	34	.....	.....	77	.....
Car-miles operated.....	23,524,443	23,499,362	10,082,296	10,271,496	4,249,170	4,152,960	9,242,977	9,074,906

TABLE IV—OPERATING EXPENSES IN CENTS PER CAR-MILE FOR FIFTY-FIVE ELECTRIC RAILWAYS SHOWN IN TABLE III FOR JANUARY, 1919, COMPARED WITH JANUARY, 1918

	United States			East			South			West		
	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase
Operating expenses.....	27.19	22.53	70.68	32.38	31.96	1.31	22.53	16.31	38.14	23.55	18.63	26.41
Way and structures.....	2.96	2.62	12.98	3.84	3.94	5.51	2.44	1.62	60.62	2.22	1.60	38.75
Equipment.....	3.53	2.82	25.18	4.28	3.85	11.17	2.74	1.70	61.18	3.08	2.17	41.94
Power.....	4.79	4.24	12.97	6.74	6.55	2.90	1.47	1.49	1.33	4.18	2.89	44.64
Conducting transportation.....	12.23	9.51	28.60	13.49	10.54	27.99	12.69	9.19	38.08	10.58	8.50	24.47
Traffic.....	0.16	0.18	11.11	0.11	0.11	0.25	0.07	257.14	0.16	0.32	50.00	
General and miscellaneous.....	3.52	3.14	12.10	3.92	3.50	12.00	2.94	2.24	31.25	3.33	31.15	5.71
Transportation for investment—Cr.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Car-miles operated.....	3,524,443	23,499,362	4.53	10,082,296	10,271,496	.....	4,249,170	4,152,960	2.32	9,242,977	9,074,906	1.85

TABLE V—COMBINED INCOME STATEMENT OF ONE HUNDRED AND FIVE ELECTRIC RAILWAYS FOR JANUARY, 1919

	United States	East	South	West
Railway operating revenues.....	\$19,684,757	\$13,848,372	\$1,347,003	\$4,489,382
Railway operating expenses.....	15,883,167	11,520,007	1,971,420	3,459,734
Net operating revenue.....	4,101,590	2,696,265	375,583	1,029,648
Net revenue from auxiliary operations.....	302,175	151,264	125,554	25,357
Taxes.....	1,295,378	864,925	141,149	289,304
Operating income.....	3,108,387	1,982,704	359,982	765,701
Non-operating income.....	514,939	245,807	195,866	73,266
Gross income or loss.....	3,623,326	2,228,511	555,848	838,967
Deductions from gross income.....	4,060,078	2,836,224	333,860	889,994
Net income or loss.....	*436,752	*607,713	221,988	*51,027
Car-miles operated.....	50,642,071	32,593,495	4,326,290	13,722,286

TABLE VI—INCOME IN CENTS PER CAR-MILE FOR THE ONE HUNDRED AND FIVE COMPANIES SHOWN IN TABLE V

	United States	East	South	West
Railway operating revenues.....	38.87	42.49	31.13	32.72
Railway operating expenses.....	30.78	34.22	22.45	25.21
Net operating revenue.....	8.09	8.27	8.68	7.51
Net revenue from auxiliary operations.....	0.60	0.46	2.90	0.18
Taxes.....	2.56	2.65	3.26	2.11
Operating income.....	6.13	6.08	8.32	5.58
Non-operating income.....	1.02	0.76	1.52	0.53
Gross income or loss.....	7.15	6.84	12.84	6.11
Deductions from gross income.....	8.01	8.70	7.72	6.48
Net income or loss.....	*0.86	*1.86	5.13	0.37
Car-miles operated.....	50,642,071	32,593,495	4,326,290	13,722,286

TABLE VII—OPERATING EXPENSES OF ONE HUNDRED AND TWENTY-THREE ELECTRIC RAILWAYS FOR JANUARY, 1919

	United States	East	South	West
Operating expenses.....	\$16,327,010	\$11,599,504	\$1,334,148	\$3,593,558
Way and structures.....	1,711,789	1,211,637	116,455	383,697
Equipment.....	2,068,983	1,467,716	135,041	466,226
Power.....	2,619,379	1,956,782	70,713	564,289
Conducting transportation.....	7,683,973	6,512,984	636,992	1,857,233
Traffic.....	72,407	32,500	11,514	28,393
General and miscellaneous.....	2,178,211	1,479,639	163,475	555,097
Transportation for investment—Cr.....	141	64	.....	77
Car-miles operated.....	53,218,125	34,272,200	4,325,584	14,620,341

TABLE VIII—OPERATING EXPENSES IN CENTS PER CAR-MILE OF ONE HUNDRED AND TWENTY-THREE ELECTRIC RAILWAYS SHOWN IN TABLE VII FOR JANUARY, 1919

	United States	East	South	West
Operating expenses.....	30.68	33.85	26.22	24.58
Way and structures.....	3.22	3.54	2.69	2.63
Equipment.....	3.89	4.28	3.13	3.19
Power.....	4.91	5.71	1.62	4.00
Conducting transportation.....	14.44	15.91	14.73	10.91
Traffic.....	0.14	0.09	0.27	0.19
General and miscellaneous.....	4.09	4.32	3.78	3.66
Transportation for investment—Cr.....	.....	.....	.....	.....
Car-miles operated.....	53,218,125	34,272,200	4,325,584	14,620,341

NOTE—\*Means loss; figures in italics indicate decrease.

## Boston Still Losing

Cost Per Passenger in March, However, Cut to 8.92 Cents as Compared with 9.30 Cents in February

The financial report for the month of March, just made public by the trustees of the Boston (Mass.) Elevated Railway, shows that the cost was 8.923 cents for each passenger carried on the system. The net loss for the month was \$224,920, as compared with a loss of \$285,124 in February and a loss of \$219,269 in January.

### \$1,178,436 A MONTH FOR WAGES

The total receipts from all sources for March, as shown in detail in the accompanying statement, were \$2,331,614. Of this amount \$2,279,683 came

### RECEIPTS AND COST OF SERVICE OF BOSTON ELEVATED RAILWAY FOR MARCH, 1919

<b>Receipts</b>	
From fares	\$2,279,683
From special cars, mail pouch service, express and service cars	7,293
From advertising in cars, on transfers, privileges at stations, etc.	24,438
From other railroads for use of tracks and facilities	3,647
From rent of buildings and other property	5,510
From sale of power and other revenue	7,768
<b>Total receipts from direct operation of the road</b>	<b>\$2,328,342</b>
Interest on deposits from securities, etc.	3,272
<b>Total receipts</b>	<b>\$2,331,614</b>
<b>Cost of service</b>	
Maintaining track, line equipment and buildings	\$232,706
Maintaining cars, shop equipment, etc.	244,884
Power, including 26,497 tons of coal at \$5.917 or \$156,440	228,972
Depreciation	167,000
Transportation expenses (including wages of car employees, carhouse expenses, etc.)	821,989
Salaries of administrative officers	7,083
Law expenses, injuries, damages, and insurance	107,772
Other general expenses	74,687
<b>Total operating expenses (of which \$1,178,436 represents wages)</b>	<b>\$1,885,161</b>
Taxes, proportion	88,160
Rent for leased roads (exclusive of subways)	215,785
Proportion of rent of subways and tunnels to be paid to the city of Boston (exclusive of Cambridge Subway owned by company)	126,638
Interest on Boston Elevated bonds and notes	118,666
Miscellaneous items	2,142
Proportion of dividends under acts of 1918	116,997
Interest on unpaid taxes	2,982
<b>Total cost of service</b>	<b>\$2,556,535</b>
<b>Net loss</b>	<b>\$224,920</b>

from fares, the revenue passengers numbering 28,652,645. The total cost of service for the month was \$2,556,535, of which \$1,178,436 was expended for wages.

### RECEIPTS PER PASSENGER 8.138 CENTS

The receipts per revenue passenger were 8.138 cents. Of the cost of service per passenger, of 8.923 cents, 4.113 cents represented the cost of labor. The total of 8.923 cents in March compared with 9.304 cents in February, 8.970 cents in January, 8.055 cents in December, and 8.961 cents for the nine months ended March 31, 1919.

The receipts under the 8-cent fare in March, 1919, as compared with the 5-cent fare in March, 1918, show an

increase of \$677,658 or 42.30 per cent, as compared with 44.85 per cent in February (1919), 43.71 per cent in January (1919) and 36.28 per cent in December (1918).

## Petition to Segregate Lines Denied

Judge Julius M. Mayer of the United States District Court was asked on April 19 to sever the Eighth Avenue Railroad and the Ninth Avenue Railroad from the New York (N. Y.) Railways. The petition was made in behalf of the stockholders of the two surface lines.

Both surface lines are operated by the New York Railways under leases that were negotiated in the early days of the Metropolitan Street Railway, the predecessor of the New York Railways. For the Eighth Avenue Railroad the New York Railways is obligated to pay an annual rental of \$215,000 and all taxes; for the Ninth Avenue line the rental is \$64,000 and taxes.

The petitioners asked the court to direct the receiver to "discontinue the use of your petitioner's said railroads, rights, privileges, franchises and other properties in said indentures or agreement prescribed and to return, surrender and deliver to your petitioners possession of the same." Corporation Counsel Burr had asked the Public Service Commission to take steps to protect the present transfer system.

Judge Mayer on April 21 denied the petition of counsel asking that the lines mentioned be severed from the system of the New York Railways. He made it clear that for the time being it was advisable to keep the system together. He announced that he had instructed the receiver to apply to him for permission to employ experts and accountants in order that the problem might be gone into in a fundamental manner.

## \$20,000,000 Needed in Brooklyn

The Brooklyn (N. Y.) Rapid Transit Company's present resources are not sufficient by \$20,000,000 to bring the service to a state of efficiency, according to Lindley M. Garrison, receiver of the company, in a statement issued on April 18. He placed the responsibility for the deficiency largely at the door of the heavy increase in the workmen's pay. His statement follows in part:

I am glad for all concerned that there was no strike. Now let us all forget it and get together to give Brooklyn the best transportation service in the country.

This is not a time for anybody to "rock the boat." The problem directly concerns everyone, the financiers at large, the men whose money is invested in the road, those who work on the road, the State authorities, the city authorities and the general public.

Our present income is not sufficient to pay our necessary expenses, a large part of which are due to the large wages which the majority of our employees now receive. To this must still be added the amount necessary to bring up to an equitable level the wages of those who did not receive a proportionate raise at the time of the recent increase.

We are terribly hampered by the fact that the city has not completed the lines it is building, and we have not the benefit of what it was intended we should have had long before this.

## Financial News Notes

**Receiver for Small Massachusetts Railway.**—George Spaulding, Canton, Mass., was appointed receiver of the Blue Hill Street Railway, Canton, Mass., on April 9 by Judge Loring of the Supreme Judicial Court of Massachusetts. The action was taken on the petition of the Old Colony Trust Company, trustee, representing holders of \$250,000 of the company's first mortgage bonds.

**Northern Ohio Company Would Issue Bonds.**—The Northern Ohio Traction & Light Company, a subsidiary of the Northern Ohio Electric Corporation, has asked the Public Utilities Commission for authority to issue \$5,995,000 of refunding bonds, of which \$3,000,000 is to bear interest at 4 per cent and the balance at 5 per cent. The company also asks permission to issue \$713,000 of first mortgage 5 per cent bonds.

**Will Pay Deferred Interest.**—F. D. Carpenter, president of the Western Ohio Railway, Lima, Ohio, has sent notices to the holders of the company's first mortgage 5 per cent bonds that interest due on the bonds on Nov. 1, 1918, together with interest at 6 per cent on the deferred payment, will be paid on April 30. The same notice states that the company will not be in funds to pay the interest on these bonds due on May 1. As soon as funds are available, notice will be published and mailed to all known bondholders.

**Scope of Protective Committee Increased.**—The protective committee for the bondholders of the Rhode Island Suburban Railway, Providence, R. I., will serve in similar capacity for the bondholders of the Pawtuxet Valley Electric Street Railway and the Cumberland Street Railway, subsidiaries of the Rhode Island Suburban Railway. Deposits of bonds will be received up to May 15 at the National Exchange Bank, Providence, and the Bankers Trust Company, New York.

**Big Gain in Dallas Over Last March.**—The net earnings of the Dallas (Tex.) Railway for March amounted to \$40,279, an increase of \$20,116 or 99.7 per cent over the corresponding month of last year. Net earnings for March reached the highest point since operation commenced under the new franchise on Oct. 1, 1917. They were equivalent to a return of 6.42 per cent per annum on the property value. For the eighteen months the net earnings have been \$482,699, equivalent to a return of 4.10 per cent per annum as compared to the allowable return of 7 per cent. The comparatively favorable showing for March was due to the increase of gross earnings by \$58,964 or 44.43 per cent to a total of \$191,662.

# Traffic and Transportation

## Six Cents in Atlanta

After Many Vicissitudes Company  
There Is Extended a Temporary  
Helping Hand

Atlanta's 6-cent fare went into effect on April 14. The Georgia Railway & Power Company in a public announcement asked the citizens of Atlanta to have as near as possible the exact change for their fare as the odd penny would cause no end of confusion if every passenger asked the conductor to change a bill or silver of large denomination.

The 6-cent fare went into effect all over the local territory with the exception of one line to Decatur and the lines to College Park. College Park and Decatur have both been asked by the company to accede to the 6-cent fare voluntarily, because in its recent decision on fares the Supreme Court held that the commission was without jurisdiction over the rates of fare prescribed in the franchise contracts of the company with College Park and Decatur, but that the commission did have jurisdiction over the rates of fare in Atlanta.

### REVIEW OF RECENT HISTORY

It will be recalled that the Superior Court of Fulton County has previously held that a contract fixing fares existed in the case of all three places. The commission had previously recommended an increase in fare for the company, which instituted mandamus proceedings to compel the commission to assume jurisdiction. The county court refused the writ. The Supreme Court then reversed the county court in part. The company then reopened its fare case before the commission. On April 2 the commission prescribed a 6-cent fare. That body explained the basis of its decision in part as follows:

In reaching the conclusion that a 6-cent fare was reasonable and just, the commission made no effort to provide a return on capitalization. The principal elements considered were the value of the service to the public and the cost of rendering it. In determining the latter it was necessary to consider the value of the property used in the public service.

No detailed appraisal of property values was attempted because of the character of the application, it being for temporary relief under unusual conditions, and the time necessary for a full appraisal.

The city of Atlanta now asks an appraisal, and offers to bear such portion of the expense as the commission may deem proper. It also asks for an audit of the company's business—both to be made by experts chosen and appointed by the commission.

The commission believes as was stated in its opinion that under normal conditions an appraisal was desirable. It now willingly avails itself of the offer of the city to bear part of the expense.

Our belief is that a long time is necessary and will be consumed in a complete inventory, appraisal and audit. We do not favor under existing conditions that it is just to the company to deny the temporary relief we believe needed, until the appraisal and audit can be completed.

In the order to be issued, prescribing a

6-cent fare, a proviso will be inserted that the increased fare shall not become effective until five days after the company shall have filed with the commission a written agreement to pay as called for by the commission, 50 per cent of the total cost of the appraisal and audit of all its properties and operations, the valuation of properties to be as of April 1, 1919, and the financial operations to be audited for the year 1918 and to April 1, 1919.

After the filing of such an agreement, if the city of Atlanta shall file with the commission an ordinance or agreement by the Mayor and Council to pay 40 per cent of the total cost of the appraisal and audit, as called for by the commission, the commission will, as soon as possible, secure the services of expert engineers and accountants to do the necessary work, under its exclusive supervision and direction.

After the completion of the work and a reasonable time to interested parties for examination and study, the commission will assign a date for formal hearing upon which the commission will open for consideration all the rates of the company, including railway fares, electric light and power, steam and gas rates.

The city further asks that it may be allowed, through such experts as it may see fit, to have appraisals, inventories and audits made as it may seem proper and submit the same to the commission.

This commission is without authority or power to compel the company to allow an opposing party access to its records and books for such purposes.

It is to be issued will provide that seventeen (17) tickets shall be sold for one dollar (\$1).

## Warning About Cleveland Fares

Fielder Sanders, Street Railway Commissioner of Cleveland, Ohio, on April 15 warned City Councilmen that unless expenditures of the Cleveland Railway are held down fares may have to be raised.

He issued this warning after he drafted a resolution for introduction in Council that will authorize the company to take \$317,394.48 from the interest fund to pay off an over-expenditure of that amount for maintenance in 1918.

The measure, which will be offered in Council, authorizes the company to take \$97,000 from the interest fund in March, and the remaining \$220,000 in eleven months at the rate of \$20,000 every thirty days.

The interest fund is the fare barometer, and when the balance falls below \$300,000 the fare goes up. When the fund reaches \$700,000 the fare is lowered. There is only \$136,000 in the fund, but it is now increasing at the rate of \$100,000 a month.

Commissioner Sanders also warned against making extensions and track renewals that can be dispensed with for the present. The company has asked for \$760,000 this year, of which \$550,000 is for track renewals.

Council will be asked by Commissioner Sanders to take \$250,000 from the amount asked for track renewals, because, he said, rails on four streets can be used several years.

"Continued renewals of track suitable for traffic not only mean a postponement of fare reduction, but may bring a higher charge," said Mr. Sanders.

## Wheeling Fares Readjusted

Five-Cent Unit Retained, but Number  
of Zones Has Been Increased  
Materially

The Wheeling (W. Va.) Traction Company, operating in Wheeling and between Wheeling and other points in West Virginia and Steubenville, Ohio, has been permitted by the Interstate Commerce Commission to change its passenger tariffs between certain points on its system.

### DECIDE AGAINST ODD FARE

After long study it was decided to continue the "nickel" as a basis of fare between points within any one zone or community rather than to try to meet the conditions by applying an odd fare collection, such as 6 cents or 7 cents, to rides within any one zone or community.

Examination of the plan ordered into effect by the Interstate Commerce Commission shows that the railway has worked out a plan for making certain changes in its present zone limits and has so far as possible taken into consideration the natural loading and unloading points on the entire system so that regular riders between any two points on the system will be inconvenienced to the least possible extent.

The new zones are made as nearly the same distance as conditions make possible and the average length of each zone would be 2.73 miles as against 3.63 under the present zone system, and the average rate per mile would be 1.83 cents as against 1.38 under the present system. The company's entire system has consisted of twenty-four zones whereas under the new system it will consist of thirty-two zones.

With the new plan in effect it will still be possible for residents of Wheeling to ride anywhere within the present corporate limits of that city for 5 cents. Even taking the system as a whole most of the passengers will still continue to ride for a 5-cent fare.

### STatement of Fares

As an example of the effect of the new zoning system, the following fares will be established: On the line from Wheeling to Bellaire the new fare will be 10 cents as against 5 cents at present. The rate from Wheeling to Martins Ferry will be 10 cents instead of 5 cents. From Wheeling to Steubenville the rate will be 50 cents instead of 40 cents. The rate from Wheeling to Bridgeport will remain at 5 cents. The rate from Moundsville to Bridgeport will be 25 cents instead of 20 cents and the rate from Moundsville to Martins Ferry will be 30 cents instead of 20 cents. These represent some of the principal changes under the new plan.

Included in the company's petition to the Interstate Commerce Commission was a considerable amount of very interesting data showing the general condition of the company's finances at the present time and the very large increase in its operating expenses during the past two years.

## Columbus Settlement Plan

Fare Ordinance Passed Which May Form Basis of Settlement Grant—Proper Service Stressed

A. E. Griffin introduced an ordinance in the City Council of Columbus, Ohio, on the evening of April 14, which may form the basis for a settlement of the fare question. It provides for a rate of six tickets for a quarter for two years on the lines of the Columbus Railway, Power & Light Company, after which the rate will revert back to the present figures of eight for a quarter. Stress is placed upon proper service. On this account control of operation so far as the number of cars and their speed are concerned has been placed with the Council.

### \$500,000 FOR IMPROVEMENT

The ordinance provides that the company shall spend \$500,000 for improvements and extensions during the remaining seven years of the grant, but it will be noted that this is very much less than called for by any of the programs heretofore laid out. In fact, it has been expected that \$1,500,000 would be used for this purpose. The author of the franchise evidently feels that the character of the service is more important than the extensions, although the right is reserved to Council to order limited extensions.

The Griffin ordinance was passed on the evening of April 21 and the long controversy between the city and company may be considered closed for the present. In addition to six tickets for a quarter, the ordinance provides for universal transfers, but leaves the cash fare as it was. Charles L. Kurtz, president of the company, is now in Mexico, but members of Council think that the ordinance will be accepted by the company on his return. The instrument leaves a possibility for a resumption of strife at the end of two years, as the road must revert to the old rate at that time.

The decision of the Supreme Court of the United States with respect to the rights of the company in the matter of fares is reviewed elsewhere in this issue.

## Service Improvements Planned

Modifications of the skip-stop system of operating street cars are being worked out by the Dallas (Tex.) Railway in co-operation with the city administration, to the end that the service may be improved in several respects. Mayor Wozencraft, the new Mayor, has held several conferences with Richard Meriwether, vice-president and general manager of the Dallas Railway, and J. F. Strickland, president.

Plans for the improvement of the service cover the following points:

The placing of additional stops in the downtown district.

Adoption of practical methods for decreasing the time incident to loading cars in the downtown district.

Rearrangement of stops in the residential district.

Stopping of cars in rainy weather on cross streets without sidewalks regardless of skip-stop signs.

Better service for the Mount Auburn and Park View additions, the sections of which have been working for the construction of extensions into their residents.

Mayor Wozencraft gave out the following statement:

The conferences with Messrs. Strickland and Meriwether were very satisfactory. While we cannot go into details as to the various improvements at present, for the present, they will be worked out as rapidly as possible and put into effect.

As to the plan to decrease the loading time of street cars, I will say that more front-end collectors will be employed to facilitate the loading of cars in the downtown district. This plan is in limited operation here now. We hope to be able to educate the public to the value of rapid loading, as it saves considerable time in the aggregate.

In the rearrangement of stops in the residential district, it is our intention to follow, in so far as it is practical, the method of staggering the stops. This will eliminate the so-called "bunch-stop" plan which is so objectionable at present. By staggering the stops, the street cars will stop, skip a block and stop again on the outbound trip, for instance, and on the inbound trip will make stops at every intersection missed on the outgoing trip. Thus no person will have to walk more than one block out of the way to get to the car, or to board a street car for the outgoing and incoming trips.

Regardless of the arrangement of the stops during rainy weather all cars will stop at all cross streets where there are no sidewalks parallel to the car line on the same street, or where patrons of the line are forced to wade through mud and slush.

While no plans have been formulated, as yet, for the improvement of the service in Mount Auburn and Park View, we are at work on this question and expect to be in a position to make needed improvements for those sections at an early date.

## 7-Cent Fare Opposed in Jersey

The Public Service Railway, Newark, N. J., has had before the Public Utilities Commission an application for an increase in fare to 7 cents from the 6-cent fare restored by the commission on April 1. Hearings on this application were under way during the week beginning April 20. These are distinct from the hearings on the zoning plan, which are also in progress.

After two adjournments requested by municipalities affected by the proposed fare increase the case was taken up on April 23. On that day Mark Wolf and Dr. Delos F. Wilcox were questioned as to the results of their examination of the company's financial statements, the purpose being to show, on behalf of the municipalities, that the proposed increase is not justified by the reports filed by the company with the commission. The endeavor was made, by means of various assumptions and calculations, to prove that the temporary fare increase which the company had been permitted to make previous to April 1 had produced more than the increase in income estimated by the company.

H. C. Eddy, senior inspector for the commission, was put on the stand by the commission to present an analysis of operating costs of the railway over a term of years. R. E. Danforth, general manager, and M. C. Boylan, auditor of the railway, were also examined as to details of these costs.

As to the zoning plan hearings, these were scheduled for resumption as this issue of this paper goes to press.

## Indianapolis Doing Better

With Return of Peace-Time Conditions Company There Seems to Have Turned the Corner

With the restoration of peace, changes in conditions of travel have resulted in a material increase in the earnings of the Indianapolis Traction & Terminal Company, Indianapolis, Ind. For the months of January, February and March the average increase has been more than \$2,000 a day, or approximately 23 per cent. This is regarded as particularly gratifying considering the very unfavorable conditions under which the company was forced to operate during the war-time period.

### COMPANY'S STRUGGLE REVIEWED

After a decision of the Supreme Court of Indiana on July 30, 1918, ruling that the Public Service Commission had jurisdiction in the matter of the petition for increased fares, the commission on Oct. 12, 1918, granted a straight 5-cent fare, with a charge of 1 cent for each transfer, this 1 cent to be refunded to the passenger when the transfer was used.

In a later order the commission cancelled the charge for transfers. The commission's order further provided for a 50 per cent increase in the wage budget of platform men, which more than absorbed the increase obtained by the company through the granting of the 5-cent fare.

A petition was entered on Dec. 14, requesting the right to charge a 6-cent fare with certain zone charges. This petition was refused by the commission and in its order of Dec. 28, 1918, certain improvements in the service, changes in capitalization, and elimination of the sinking funds were suggested in order to reduce fixed charges.

### BOND INTEREST PASSED

As a result of this order the Indianapolis Traction & Terminal Company on Jan. 1, 1919, did not pay the bond interest on the \$6,000,000 of the Indianapolis Street Railway 4 per cent bonds. A committee of stockholders was accordingly appointed at the annual meeting of the company on April 10 to consider the changes in capitalization and sinking funds, which will be submitted at a further meeting of the stockholders which will be held on May 8.

In compliance with the suggestion of the Public Service Commission, work was started some time ago on the conversion of the standard type of closed car for prepayment fare collection and the majority of the cars have already been converted. The company had contemplated doing this work previously, but the reconstruction had to be suspended on account of conditions brought about by the war.

The situation with respect to the plans being matured for the financial readjustment of the Indianapolis Street Railway is reviewed on page 840 in this issue.

### Kansas City, Kan., Increase Denied

The Public Utilities Commission of Kansas has decided that there is not sufficient cause for raising the fare in Kansas City, Kan., as asked by the Kansas City Railways. The rate will therefore continue at 5 cents.

The commission took the stand that conditions in Kansas City, Kan., are different from those in Kansas City, Mo., where the fare is 6 cents. In Kansas, the decision pointed out, the haul is much shorter than in Missouri, the longest rides in Kansas being only about 5 miles.

The commission also took cognizance of the fact that Kansas passengers are paying 6 cents now when they enter Missouri, the extra penny being collected at the State line.

The company's troubles, the ruling said, appear to be principally from the fact that the same fare is charged regardless of the distance a person rides. It predicted indirectly that some time in the near future the company would have to install a zone system.

The commission retained jurisdiction that it may rule on a zone system or a rate increase in the future if another ruling should seem necessary.

The company, by the decision, loses a fight of more than a year, six months of that time being spent in a court struggle with the city administration of Kansas City, Kan., which brought suit to prevent the State commission from hearing the company's application for a higher fare than that stipulated in its franchise.

### A Labor Man on the Five-Cent Fare

The Bridgeport *Evening Post* of April 4 quoted John J. O'Neill, of the State Labor Union, as follows in regard to the attitude of organized labor with respect to fares of more than 5 cents:

From the standpoint of a workman the charge of any fraction over 5 cents will never be popular. This trolley fare has been discussed in an informal way, time and time again, by members of the trade unions, after the formal meetings. Men will walk rather than ride where the tax is more than 5 cents. From the sentiments expressed, I actually believe that the average man would rather pay 10 cents than 6 or 7. There is something in that extra cent that men rebel against.

The trolley people, in my opinion, made a great mistake when they raised the fare over 5 cents instead of introducing the one-man car. I know this is my actual experience and observation. I was induced to move to the North End of the city where I built a home because it was represented to me that the trolley accommodations were ample. After I got actually settled in my new home the trolley raised its rate to 6 cents, and so, rather than pay the extra cent I walk or take a jitney.

My case is one of a thousand. I could give names of many people living in the North End who do just as I do, and if there are hundreds in my section of the city how many more are there in the other sections of the city?

If the solution of the local problem is the one-man car, the company should install the one-man car all over. In time the one-man car will run the jitney out of business. In my opinion, if the people will patronize the trolley car rather than the jitney. Many jitties are operated by men who lack consideration for their customers. I have been

in them when I wished that my accident insurance was larger. I don't like smoke, and when another passenger is puffing tobacco smoke in my face I refrain from protesting, as they would eat the crab from a crank and all that. So if the small trolley cars were in operation, and the fare was down to 5 cents, I am sure that the women of the city would desert the jitney for the trolley. I have no objection to the railway rearranging fares for the longer rides in the city, but I do object to establishing a new system of fare zones, if that is necessary.

### Six Cents in Steubenville

At a special meeting of the Council of Steubenville, Ohio, recently, the proposal agreed upon by the Council for extending a measure of relief to the Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio, was presented to the company. After a trial of three months the arrangement will be in force for a period of two years. The necessary ordinance which will permit the company to make a uniform charge of 6 cents will be passed by the Council. A fifteen-minute schedule during certain hours on the La Belle View line of the railway company has also been agreed upon.

By way of confirming the understanding, C. L. Williams, city solicitor of Steubenville, has written to the company that the Council has decided to permit the company to charge a 6-cent fare and sell nine tickets for 50 cents; that service shall be increased in accordance with plans previously advanced; that the matter of one-man cars apparently does not come within the limits of the ordinance under which the company operates and must be settled by the company with its employees; that the company must discontinue the skip-stop system of operation, and that the fare increase is only an emergency measure to continue for not more than two years.

### Mr. Lowry Favors a 10-Cent Fare

In an address before the Minnesota section of American Institute of Electrical Engineers at the University of Minnesota, Horace Lowry, president of the Twin City Rapid Transit Company, Minneapolis, Minn., discussing electric railway conditions, put himself on record as follows:

Personally, I am for a straight 10-cent fare, with tickets at the rate of four for a quarter or on some such basis.

We are going to have a lot of trouble with change if we get mixed in this penny business. Few passengers would suffer from a 10-cent fare if we sold tickets cheaper, as I have suggested. Everybody would have a chance to buy tickets which would cost approximately 6 cents each.

Personally I am opposed to charging for transfers. I believe such a system could not help making for discrimination between those who happened to live on a certain car line and those who did not.

Everybody has a kick at the electric railway service at least once a year. It may be once in many instances. In many more it is not. Owing to inadequate funds our service during the past winter has been poorer than in former years. A lot of people have said we were going to force an issue, but we will submit our books to anyone who wants to see. We have offered ever since we were in business to have offered to do everything anyone asked us to do. We have only asked for an opportunity to finance the company adequately and to build extensions and improve our service.

### Zone Fares Fixed for Fishkill Electric Railway

The Public Service Commission for the Second District of New York under an order passed on March 28, has authorized the Fishkill Electric Railway operating between Fishkill and Beacon, to charge passengers as follows:

Zone 1, terminal in Fishkill to Mulholland's gate, 1.2 miles, 5 cents.

Zone 2, Mulholland's gate to Glenham switch, 1.1 miles, 5 cents.

Zone 3, Glenham switch to Beacon terminal, 3.7 miles, 6 cents.

Through fares established are: between points in zones 1 and 2, 8 cents; between points in zones 2 and 3, 11 cents; between points in zones 1 and 3, 14 cents.

Commutation fares, fifty-four trip tickets good to purchaser only if used within thirty days, between points in zones 1 and 3, \$5.40; between points in zones 2 and 3, \$4.85.

School tickets, strip tickets, ten coupons each between points in zone 1 and Beacon, 70 cents a strip; between zone 2 and Beacon, 55 cents a strip.

The commission further directs the railroad to maintain the same service between Beacon and Fishkill as given during December, 1918, and to report monthly to the commission a record of passengers carried within each zone and between the different zone divisions with the revenue received.

The commission has denied the company's petition for approval of a declaration of abandonment of its line west of the Glenham switch.

The order of the commission became effective on April 1.

### Interurban Would Penalize City Riders

The petition of the Interstate Public Service Company to increase its rates for passengers within the city limits of Indianapolis from 5 cents to 10 cents has been continued for two weeks by Commissioner Charles A. Edwards. Robert G. Gordon, attorney for the interurban company, said that the increase was asked because it would tend to keep local passengers off the interurban cars. This, of course, is one of the things that the interurban company desired.

Merle N. A. Walker, appearing for the property owners in the southwestern part of the city, suggested that the commission grant the increase on condition that an agreement be made with the Indianapolis Traction & Terminal Company for the leasing of the interurban railroad tracks within the city limits for a nominal rental and for the city company to provide city service on this line.

Samuel Ashby, Corporation Counsel of the city, opposed this suggestion. He said that the city could not compromise itself by agreeing to permit one interurban to increase its city fare 100 per cent and not permit all other interurban electric railways that operate into the city to make similar increases.

## Transportation News Notes

**One-Man Cars in Kansas City.**—One-man cars were placed in operation on the Sunset Hill Line by the Kansas City (Mo.) Railway on April 20.

**Recommends Return to Five-Cent Fare.**—The City Council of Ottumwa, Ia., has passed an ordinance recommending the return to the 5-cent fare on the lines of the Ottumwa Railway & Light Company, the 6-cent fare having been allowed on Dec. 23.

**Five-Cent Fare Restored.**—Five-cent fares were restored in Battle Creek, Mich., on April 22 as the result of action taken by the City Commission on April 21, voting to rescind the 6-cent fare resolution passed in favor of the Michigan Railway nearly ten months ago.

**Seven-Cent Zones Authorized.**—The Tyler Traction Company, operating between Sistersville and Middlebourne, W. Va., has been allowed by the Public Service Commission to increase its passenger rates from 5 cents to 7 cents for each of the six zones, making the new fare between the towns 42 cents. Half-fare rates are to be allowed for students.

**Six Cents in East St. Louis.**—The East St. Louis (Ill.) Railway has been granted permission by the Public Utilities Commission of Illinois to continue until July 3, the increase in adults' single cash fare to 6 cents each and those of children to 3 cents each. Transfers are to be free, but may be so restricted as not to permit a round trip for one fare. The company had asked for an increase to 7 cents for adults.

**Amended Petition at Lincoln.**—An increase in fares and the establishment of three zones is asked by the Lincoln (Neb.) Traction Company in an amended petition filed with the State Railway Commission of Nebraska. Under the tariff now proposed the company would charge 9 cents a trip between Lincoln and Havelock and 7 cents between Lincoln and other surrounding towns.

**Arranging for Fare Increase.**—The Yonkers (N. Y.) Railroad has postponed for a few days putting into effect the fare increase recently allowed by the Board of Aldermen. Certain changes in operation in connection with the fare advance must be made. As noted in the *ELECTRIC RAILWAY JOURNAL* for March 29, the Aldermen on March 22 voted to permit the Yonkers Railroad to charge an extra 5-cent fare beyond the city limits.

**Six-Cent Fares in British Columbia.**—The advent of the 6-cent fare on the lines of the British Columbia Electric Railway, Vancouver, B. C., has compli-

cated somewhat the fare-collection system used there. In conformity with Canadian custom, the company has used a fare box which could be carried through the car and which took the small Canadian 5-cent coins and tickets. Under the present system tickets are sold, and only tickets are put in the fare box.

**Resumption of New York State Hearings.**—The Public Service Commission for the Second District of New York has set April 30 as the probable date for the resumption of the hearing on the financial condition of the New York State Railways. At this hearing Benjamin B. Cunningham, corporation counsel of Rochester, N. Y., will cross-examine upon the figures recently submitted by an expert employed by the railway to make a physical valuation of its properties.

**Jitney Regulated in Bloomfield.**—By a vote of six to one the Town Council of Bloomfield, N. J., on April 21 passed on final reading a jitney ordinance which provides for payment of a yearly license fee of \$100, filing of a liability insurance bond in the sum of \$5,000, and appointment of an inspector by the officials. Because the Council refused to agree not to issue more than sixty licenses, jitney service was withdrawn on the Newark-Bloomfield route several weeks ago.

**Vehicle Turns in Vancouver.**—The city of Vancouver, B. C., is considering a change from the rule of passing to the left, which has been followed for many years, in favor of the turn to the right, as in the United States. If the city makes this change, the local company, the British Columbia Electric Railway, will have to change its car platforms and cross-overs. The proportion of this expense to be paid by the city and the province will probably have to be settled by legislative enactment at the next session.

**Increase in Train Service.**—The Monongahela Valley Traction Company, Fairmont, W. Va., has put on two trains between Clarksburg and Fairmont. The trains are composed of four of the new interurban cars—two to each train. In addition the third train is composed of the old-type interurban cars. The company will, in the near future, place more new equipment in use. Four additional new interurban cars have arrived from the manufacturer and just as soon as they can be fitted out, two of these cars will be utilized to form the third train between Fairmont and Clarksburg.

**Protest Against Indiscriminate Use of Word "Subway."**—Frank Hedley, general manager of the Interborough Rapid Transit Company, New York, N. Y., objects to the Brooklyn Rapid Transit Company using the word "subway" in connection with its underground line in Manhattan. Mr. Hedley told members of the Public Service Commission recently that he believes the Interborough is the only company entitled to call its underground line a

subway. The acting chairman of the commission suggested it might be wise for both the companies to eliminate the use of the word "Broadway." The commission decided to defer action.

**Paying Increase in Fare Voluntarily.**—At the present time the New York & North Shore Traction Company, Roslyn, N. Y., is averaging about 400 voluntary 7-cent fares daily. When the voluntary movement was at its height, the company received around 800 7-cent fares daily. The railway carries between 3000 and 4000 people inside the city limits of Greater New York daily, so that the percentage paying a 7-cent fare is small. The interests not identified with the company who fostered the voluntary increased fare plan hope to be able to revive the voluntary movement soon. The New York City administration still turns a deaf ear to the plea of the company for permission to exact an increase in fare from its patrons.

**No Free Rides Upheld.**—Supporting the principle laid down by Thomas F. Murphine, Superintendent of Public Utilities of Seattle, Wash., and head of the railway system recently acquired by the city, that no person shall be allowed to ride on the municipal lines without paying the usual 5-cent fare, the public safety committee of the Council recently approved the ordinance appropriating money from the general fund to the car fare of members of the Police and Fire Departments when obliged to ride on the cars in performance of their duties. The ordinance provides for an appropriation of \$20,000, or so much of that sum as may be necessary. Other city departments have always provided for this expense, appropriations running from \$50 to \$500 a year. Carfare will be provided only for transportation on duty, and does not include rides to and from homes. The protests against making everybody pay were referred to in last week's issue.

**Commission Upholds Increase.**—The Public Service Commission of Pennsylvania in an opinion rendered by Commissioner John S. Rilling has dismissed complaints filed against the rates of fare of the Bangor & Portland Traction Company, Bangor, Pa., but directing that the company file a detailed statement of its receipts and operating costs for the year ending Jan. 1, 1920, furnishing a copy also to counsel for the complainants who may have the right to renew the complaint. The evidence, says the commissioner, indicates that the increase in fares and zones will not produce more revenue than the company has a right to collect. Its territory is limited and the commissioner holds that "what was a fair rate for an electric railway became inadequate by reason of increased prices brought about through war conditions" and, therefore, "the public must expect to pay increased rates for the services it accepts from a utility in like manner as it pays increased prices for other needs."

## Personal Mention

### Changes in Puget Sound Personnel

A. W. Leonard, president of the Puget Sound Traction, Light & Power Company, Seattle, Wash., has announced a partial reorganization of the personnel of the company, with the statement that complete reorganization will be effected about May 1. The changes effective immediately are as follows:

The position of manager of auxiliary operations is created, and the position of assistant to the president abolished. W. J. Grambs, who has held the abolished position, becomes manager of auxiliary operations, and under the new plan will report to W. H. McGrath, vice-president. The auxiliary operations department will include the following subsidiary companies: Diamond Ice Company, Renton Coal Company and Washington Auto Bus Company.

The position of chief electrical engineer is created. G. E. Quinan has been promoted to this position. Mr. Quinan has been electrical engineer for the Seattle division. That position will now be filled by S. C. Lindsay, formerly assistant engineer of the Seattle division.

Following the resignation of General Manager G. A. Richardson, H. R. Leigh, Jr., has been appointed superintendent of the Washington Auto Bus Company. Until the reorganization of the Seattle division of the Puget Sound Traction, Light & Power Company is completed, all heads of departments will report direct to Vice-President McGrath.

Richard McCulloch, president, has been retained as operating head of the United Railways, St. Louis, Mo., by Rolla Wells, the receiver.

Philip Dawson, M.Inst.C.E., M.I. Mech.E., M.I.E.E., has been created by Albert, the King of the Belgians, "Chevalier de l'Ordre de Leopold," in recognition of his services as a member of the Belgian Royal Commission on the electrification of the Belgian State Railways.

L. E. Stibbe, formerly editorial representative of this paper, first in New York and later in Chicago, has joined the advertising department of the General Electric Company. During the war Mr. Stibbe served overseas with the Engineers' Corps with the rank of sergeant.

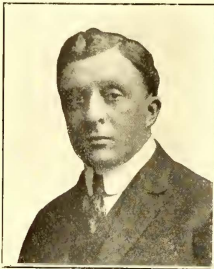
Allen C. Davison, who before the war was on the editorial staff of this paper, has become managing editor of *Let's Go*, a military publication, which "emanates weakly" from Hill 772, Verneuil, France. Mr. Davison is corporal of the Motor Transport Reconstruction Corps, of which *Let's Go* is the official organ.

H. J. A. Gerard, who has been chief engineer of the Alton, Granite & St. Louis Traction Company, now is in charge of the power house of the East St. Louis Light & Power Company at Alton and the line and meter distribution departments of the Alton Gas & Electric Company and the Hartford, Piasa & Granite City substations of the Alton, Granite & St. Louis Traction Company.

### A. L. Kempster in New York

A. L. Kempster has been called to aid in the present study of the New York Railways and Brooklyn Rapid Transit lines under the receivers of these properties.

Mr. Kempster was manager of the Seattle division of the Puget Sound Traction, Light & Power Company be-



A. L. KEMPSTER

fore the system was acquired by the city of Seattle. Mr. Kempster will first assist Frederick P. Royce, general manager for the receiver of the Brooklyn Rapid Transit Company, and will then give his time to the receiver of the New York Railways.

Mr. Kempster entered the employ of the consolidated street railways of Seattle, Wash., as an office boy on Nov. 10, 1891. He went from that place to the position of accountant, then became auditor and secretary of the consolidated properties in the city of Seattle, both being progressive steps in his advancement. When the Seattle Electric Company was organized, in 1899, he entered the operating department as trainmaster of the system. Later he became superintendent of transportation, then general superintendent and finally manager of the Seattle division of the Puget Sound Traction, Light & Power Company.

The study that is now being made of all the lines in the borough of Manhattan under the receiver is being car-

ried on by Stone & Webster, engineers, and Price, Waterhouse & Company, accountants.

C. W. Kellogg, of Stone & Webster, is in charge of the study of the Manhattan lines. Soon after Mr. Royce went to the Brooklyn Rapid Transit Company he called G. A. Richardson to assist him. Mr. Richardson was superintendent of the Seattle division of the Puget Sound Traction, Light & Power Company, of which Mr. Kempster had been manager, in Seattle. Mr. Richardson was with Mr. Royce for a few weeks and then went to Philadelphia, where he is now superintendent of transportation of the Philadelphia Rapid Transit lines.

## Obituary

George E. Claffin, a vice-president of the Electric Bond & Share Company, New York, N. Y., died suddenly on April 18 at Atlantic City, where he had gone for the Easter holidays. Mr. Claffin was born in Providence, R. I., in 1866, and was graduated from the Massachusetts Institute of Technology in 1888. He was connected with some of the earliest electric power and electric railway installations in the country. He was later a member of the firm of Lewis & Claffin, consulting engineers, Providence, R. I. In 1904 he became associated with the United Electric Securities Company, Boston, and in 1913 he was elected a vice-president of the Electric Bond & Share Company.

Samuel E. Smith, formerly general manager of the Reading Transit & Light Company, Reading, Pa., died of a complication of diseases on March 24 in Reading. It was while filling a position in Mobile, Ala., that Mr. Smith was taken ill. In the hope of regaining his health he returned to Reading to live with his parents. Mr. Smith was born in Womelsdorf, Pa., in 1877. He resided in Reading nearly all his life. He attended the schools in Womelsdorf and was graduated from the Interstate Commercial College in Reading. Early last November, 1918, Mr. Smith was appointed general manager of the Mobile Light & Railroad Company, Mobile, Ala. On Nov. 23, he was taken ill at Mobile and soon returned to Reading. Mr. Smith began his career with the Reading Transit & Light Company more than ten years ago as purchasing agent and soon was advanced to claim agent. With rapid promotion he passed to the superintendent's office, which he filled for a brief time, and then became general manager. Mr. Smith at one time was purchasing agent for the Trenton Brick Company. After several years with this firm he joined the Montello Brick Company's force, where he remained until the concern went into bankruptcy. It was after this that Mr. Smith entered the employ of the Reading Transit & Light Company.

# Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,

SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

## Rail Bond Purchasing Slow

**Little Track Work Being Done—Operators Waiting for Readjustment of Conditions**

It is apparent that very little track work is being done so far this year, for the manufacturers of rail bonds report that the buying of this equipment is hardly up to the normal purchases of the past two years. The building of track for the last few years has, of course, been considerably below the normal of former years. The figures compiled by the **ELECTRIC RAILWAY JOURNAL** and published in the issue of Jan. 4, show that, exclusive of the additions to new rapid transit lines in New York City, there were 233 miles of new track built and 130 miles rebuilt during the past year. This represents an increase in mileage of less than one-half of 1 per cent and shows that only about one-quarter of 1 per cent of the total mileage was rebuilt.

### READJUSTMENT TO STIMULATE BUYING

There has been a steady decrease in the amount of track extensions for the past five years, or since the beginning of the war, and the present conditions indicate that the signing of the armistice has had no material effect upon electric railway work. New work can hardly be undertaken extensively until the signing of peace and a complete readjustment of conditions, which will give the railway operators the funds which they have sorely needed for several years. At present, the roads are holding out for price reductions although they fully realize that the immediate possibility of such is remote. When the readjustment comes there will be buying and work a plenty, for much track has been allowed to decline to an extent the necessity for which is to be regretted.

Due to the lack of buying by the electric railways the manufacturers of rail bonds are carrying very little stock on hand. Six months ago the demand of the mining industry for rail bonds exceeded that of the electric railways. The program of the Fuel Administration was such that the electrification of coal mines became essential and the buying of rail bonds for this purpose made up for the lack of construction in the railway field and necessitated that the manufacturers carry some supplies on hand. Some of the mines are now shut down entirely, the majority of the others are operating only 50 per cent time and those needing bonds are supplied well ahead. While one manufacturer can promise deliveries inside of ten days, others state that practically

any type and quantity can be furnished in three weeks.

About March 1, the discount on rail bonds was increased from 20 to 25 per cent. No change in prices has taken place since that time, but as the copper market is uncertain, a fluctuation in the price of this staple may bring a further revision in the cost of the rail bonds at any time.

## Wheel Market Marking Time

**Steel Wheel Buyers Apparently Waiting for Cut in Price—Manufacturers Anticipate No Change**

The market for steel car wheels seems to be widely affected by the belief that prices will soon take a tumble. Why this belief should have taken such deep root is not readily explainable, for it would seem very apparent that the cost to the manufacturer is just as great now as it was before the armistice was signed. It is true that the price of steel has dropped and that there is plenty of raw material to be obtained, but the cost of the raw material amounts to a very small part of the cost of the finished product. From the ore field to the finished car wheel the item of labor probably amounts to 85 per cent of the total cost. There is no indication that the cost of labor will be reduced very soon.

Considerable interest is being shown in, so far as inquiries are concerned, but buying continues hardly normal just at present. A large per cent of the purchases are repeat orders.

Due to the light demand, manufacturers of steel wheels are carrying little stock and this is confined to the standard A. E. R. E. A. 33-in. wheel. Deliveries on this wheel can be made in from three weeks to thirty days and on other special types in from forty to sixty days. Prices still remain the same although one manufacturer indicates that there might be a slight drop in the next month. This would be due to the fact that it is realized wages and high cost of materials must gradually come down together. Some manufacturers feel that they should take the first step down and that labor will then feel safe to follow.

Conditions of steel wheel buying are practically the same in the steam railroad field as in that of the electric railways, although the former business of course constitutes a considerably larger percentage of the total. The manufacturers look forward very optimistically, however, to the increased buying which they expect from the electric railways as soon as these companies can obtain sufficient capital to finance purchases.

## Fender Market Active

**Favorable Export Demand With Domestic Sales Largely for Rolling Stock Now in Operation**

Current sales of car fenders and life guards are found by one of the prominent producers to be in a very satisfactory condition. Of course, there is not the market that there was five years ago, owing to the greatly decreased number of new cars being built. There is, however, the regular maintenance market to take care of accidents which wreck fenders and a certain market for equipments for new cars. In addition there is the market for replacement. Some of this is caused by the wearing out of the old equipment, but not a small part is due to the replacement of existing equipments by others which appear to be better adapted to traffic conditions.

Inquiries in the domestic market are caused largely by local regulations requiring the installation of life protection devices. Where such are not required road managers are not so apt to purchase these devices on their own initiative, owing primarily to their belief in the safety to the public of their own road. In such places the manufacturers are making efforts to interest the operators in protective devices.

In addition to the domestic market activity is growing in the export field. Inquiries are coming in for American equipments and favorable business is coming out of them. Such protective devices, it is stated, are being applied to the rolling stock in virtually every civilized country.

## Some Track Equipment Shows Life

**Activity Reported in Domestic and Foreign Fields for Rail Joints—Bond Testers Normal**

It is gratifying to note that there is a favorable market in a few articles of track supplies and maintenance. This is borne out in the increased activity shown in the inquiries received for rail joints and the number of orders resulting from these inquiries.

It is not only in the States that these orders have originated but many also have come from foreign fields. This export trade is the particularly bright spot in the market. Canada stands out especially in this respect, and the South American countries are also a satisfactory outlet for this material.

The market for rail bond testers has been found normal.



### War Cost of Electric Railway Equipment

For the information of the Liquidation Commission, the office of the Chief of Engineers has prepared an estimate of the costs of railroad equipment

UNIT COST OF STANDARD GAGE RAILWAY EQUIPMENT COMPARED WITH PRE-WAR COST

	Shipped to A. E. F.	Unit Price Pre-War	Actual War Cost	Actual Cost in Per Cent of Pre-War Cost
<b>Locomotives:</b>				
Consolidation.....	1,306	\$17,500	\$42,966	245
Gasoline.....	10	9,350	22,000	235
Saddle tank.....	30	4,500	9,700	216
<b>Total.....</b>	<b>1,346</b>			
<b>Cars:</b>				
Tank.....	675	1,567	3,397	248
Gondola, l. s.....	3,429	1,000	2,340	235
Flat.....	1,900	982	2,107	215
Box.....	7,299	1,290	2,755	214
Refrigerator.....	950	1,649	3,489	212
Gondola, h. s.....	2,650	1,155	2,430	210
Dump.....	500	1,026	2,108	206
Ballast.....	400	1,454	2,987	205
Box, with cab.....	500	1,366	2,770	203
<b>Total.....</b>	<b>18,303</b>			

COST OF STANDARD GAGE RAILWAY EQUIPMENT COMPARED WITH PRE-WAR COST

	Pre-War Cost	Actual Cost	Actual Cost in Per Cent of Pre-War Cost
<b>Locomotives.....</b>	<b>\$23,083,500</b>	<b>\$56,624,870</b>	<b>245</b>
<b>Cars.....</b>	<b>22,946,745</b>	<b>48,822,100</b>	<b>214</b>
<b>Total.....</b>	<b>\$45,430,245</b>	<b>\$104,446,970</b>	<b>230</b>

shipped to the A. E. F. computed on the basis of 1914 prices. The government actually paid from two to two and a half times the pre-war costs, as shown by the table.

### New Firm of Advisory and Purchasing Engineers

Wheeler, Mechlin & Rhea have formed a firm of advisory and purchasing engineers with headquarters in the West Street Building, New York City. It has been organized to furnish service to foreign and domestic clients purchasing machinery and engineering materials in the United States, and also to construct, maintain and operate properties. Among the products which the company is prepared to purchase are general construction materials and plant, electric railway materials, equipment and supplies and electric light and power apparatus and supplies.

The service to be rendered includes overseeing of shipments, inspection of bills of lading and goods, and forwarding.

The personnel comprises Earl Wheeler, formerly treasurer and general manager of the Electric Speedometer Company and local manager of the General Electric Company, Washington, D. C., and Lieut. Colonel of Engineers, U. S. A.; O. A. Mechlin, formerly of Mechlin and Starr, architectural engineers, Washington, D. C., Lieut. Commander, civil engineering corps, U. S. N.; Frank Rhea, formerly supervisor of track of the Norfolk and Western Railway, division engineer of the Pennsylvania system, and com-

mercial engineer of the railway engineering department of the General Electric Company.

### Franchises

**Montgomery, Ala.**—The Montgomery Light & Traction Company has asked the City Commissioners of Montgomery for permission to construct a 1-mile extension to Wright Field.

**Miami, Fla.**—The Miami Beach Electric Company has received a franchise from the City Council to construct an electric line at Miami Beach. Carl G. Fisher, president.

### Recent Incorporations

**Selma (Ala.) Electric Company.**—Articles of incorporation have been filed by the Selma Electric Company to own, operate and conduct a general traction business in the city of Selma and vicinity. It is understood that the new company is formed for the purpose of protecting the interests of the largest stockholders in the Selma Traction Company, which will be sold at auction in May. Incorporators: Charlotte L. Waters, Gertrude E. Abbott, D. L. Gerould and Hugh Mallory. D. L. Gerould, Warren, Pa., is named as president and Hugh Mallory as secretary-treasurer and general manager.

**Carolina & Georgia Railway, Asheville, N. C.**—Incorporated to construct a line from Andrews to Hayesville, about 25 miles. Officers: John C. Arbogast, president and general manager; S. F. Chapman, secretary and treasurer, and L. Chapman, vice-president, all of Asheville, N. C.

### Track and Roadway

**St. Petersburg, Fla.**—It is reported that plans are being considered by W. D. McAdoo, St. Petersburg Beach, for the construction of an electric railway from Davisti to Pass-a-Grille, about 7 miles.

**Quincy (Ill.) Railway.**—Work will be begun soon by the Quincy Railway on the complete rehabilitation of its system. A large number of new switches and crossings will also be installed.

**Iowa Railway & Light Company, Cedar Rapids, Iowa.**—It is reported that the Iowa Railway & Light Company has under consideration the construction of an extension to the Old Soldiers' Home.

**United Railways & Electric Company, Baltimore, Md.**—Arrangements are being made by the United Railways & Electric Company for the erection of a new two-story reinforced concrete signal tower to be located at its properties at Sparrows Point.

**Trenton & Mercer County Traction Corporation, Trenton, N. J.**—Permission has been granted the Trenton & Mercer County Traction Corporation by the City Commission to place all its

heavy transmission lines in conduits which now run overhead along Lincoln Avenue from the power station. When the work is finished the many trolley poles will be removed.

**Interborough Rapid Transit Company, New York, N. Y.**—The Public Service Commission for the First District of New York has awarded to Terry & Tench, New York, N. Y., at \$586,700, the contract for the construction of the Westchester Avenue elevated extension of the Pelham Bay Park branch of the Lexington Avenue Subway. Construction is to begin shortly, upon the approval being obtained of the Board of Estimate and Apportionment. Arrangements have been made by the Commission that in so far as possible the track laying and station finish work shall be constructed simultaneously with the general construction work, so that the line can be completed and placed in operation bit by bit east of the present terminus of operation, namely Hunts Point Avenue. The Commission has reason to believe that the general construction will be completed as far as the terminus of the elevated portion, namely, Pelham Bay Park, by the end of the year, and that a considerable additional portion of the line will be in operation by that time.

**Durham (N. C.) Traction Company.**—A report from the Durham Traction Company states that it plans to reconstruct 1½ miles of track.

**Cleveland (Ohio) Railway.**—Work has been begun by the Cleveland Railway on the construction of a new cross-town line on East Thirtieth Street from St. Clair Avenue to Pittsburgh Avenue, a distance of 2 miles. The cost of construction will be about \$250,000.

**Oklahoma (Okla.) Railway.**—An interurban line from Tulsa to Oklahoma City is being promoted by John Shartel, vice-president and general manager of the Oklahoma Railway.

**Tulsa (Okla.) Street Railway.**—An extension will be built by the Tulsa Street Railway on Pearl Street.

**Berlin & Northern Railway, Kitchener, Ont.**—The Berlin & Northern Railway has asked the Ontario Legislature for permission to change its name to the Waterloo-Wellington Railway and to extend the time in which to construct an extension from Bridgeport to Elora and Fergus.

**Peterborough (Ont.) Radial Railway.**—It is reported that the Peterborough Radial Railway has under consideration the construction of an extension on Park Street from Albert Street to Lansdowne Street and an extension from Peterborough to the summer resorts on the Kawartha Lakes.

**Buffalo & Lake Erie Traction Company, Erie, Pa.**—Work has been begun by the Buffalo & Lake Erie Traction Company on the construction of an extension up State Street to Twenty-sixth Street and on Twenty-sixth Street to American Avenue. Further improvements are also planned.

South Carolina Light, Power & Railways Company, Spartanburg, S. C.—The City Council has awarded the South Carolina Light, Power & Railways Company a contract for lighting the city for a period of ten years. Under the terms of the new contract the company will install an ornamental lighting system in the business district.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—Alterations will be made at once to the waiting station of the Puget Sound Traction, Light & Power Company at 601 Olive Street, estimated to cost \$5,000.

### Power Houses, Shops and Buildings

British Columbia Electric Railway, Vancouver, B. C.—Plans are being made by the British Columbia Electric Railway for the construction of a station at Langley Prairie.

Pacific Electric Railway, Los Angeles, Cal.—A new passenger and freight station will be built by the Pacific Electric Railway at Harbor City.

Georgia Railway & Power Company, Atlanta, Ga.—The sixth turbine and generator at the Tallulah station of the Georgia Railway & Power Company will soon be placed in service. The work has been in progress about one year and will cost about \$500,000.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md.—Terminal improvements to cost \$1,250,000 will be made this year by the Washington, Baltimore & Annapolis Electric Railway, \$750,000 of this being for a large combined freight and passenger terminal at the corner of Howard and Lombard Streets, Baltimore, and \$500,000 for a new passenger terminal to be erected on New York Avenue between Eleventh and Twelfth Streets, Washington. The contract for the Washington terminal will be let this summer.

Philadelphia, Pa.—Sealed proposals will be received by William S. Twining, director of the Department of City Transit of Philadelphia until April 29 for the following work appertenant to the Frankford Elevated Railway: Contract No. 551—Erection of brick, steel and reinforced concrete station buildings at the northeast and southwest corners of Kensington and Allegheny Avenues, including the removal of existing buildings on these sites, and Contract No. 552—Erection of brick, steel and reinforced concrete station buildings at the southwest and southeast corners of Kensington Avenue and Somerset Street, including the removal of existing buildings from these sites. Copies of plans and specifications may be had upon deposit of \$10 for each set of plans, which will be refunded upon return of plans.

Texas Power & Light Company, Dallas, Tex.—The Texas Power & Light Company, which furnishes energy to the Texas Electric Railway, contemplates the construction of an addition to its plant at Waco to cost about \$200,000.

### Trade Notes

Reciprocating Electric Tool Company, Louisville, Ky., has increased its capital from \$10,000 to \$100,000.

Mitchell-Rand Manufacturing Company, 99 John Street, New York City, has removed to larger quarters at 18 Vesey Street.

J. H. Deppeler of the Metal & Thermit Corporation was on April 11 elected a director of the American Welding Society.

Independent Lamp & Wire Company, York, Pa., manufacturer of wire products, will build a one-story addition at a cost of \$6,500.

Page Steel & Wire Company, with its main plant at Monessen, Pa., has put all departments on an eight-hour day basis in order that more men may be employed.

Power Specialty Company, Dansville, N. Y., manufacturer of Foster superheaters, is arranging for the manufacture of a new fuel-saving device now being developed.

B. H. Ahlers, formerly sales manager of the circuit breaker division of the Condit Electrical Manufacturing Company, has since March 1 taken up sales work with the insulated-wire division of the Marlin-Rockwell Corporation, New Haven, Conn.

C. E. Hague, formerly production engineer of the Mid-West Engine Company, Indianapolis, Ind., has been appointed sales manager of the American Steam Conveyor Corporation, Chicago, manufacturer of steam ash conveyors and other ash-handling equipment.

Chicago Insulated Wire & Manufacturing Company, Sycamore, Ill., suffered loss by fire in the neighborhood of \$150,000. Several buildings and some stock were damaged. The plant was one of the largest in the Central West for the manufacture of insulated copper wire.

Van Dorn Electric Tool Company, Cleveland, Ohio, will soon erect a four-story addition to its plant. The new plant, like the present factory, will be devoted entirely to the making of portable electric drills and grinders. All parts of the specially designed motors are made in the plant.

A. P. Green Fire Brick Company, of Mexico, Mo., has opened an Eastern district sales office in New York City at 30 Church Street. Howard C. Thayer, formerly field mechanical engineer for the J. G. White Engineering Corporation at the United States nitrate plant No. 2, is in charge.

Metal Statistics for 1919.—The American Metal Market and Daily Iron and Steel Report, New York, has issued its twelfth annual edition of "Metal Statistics." The preface states that "there is now so much interest in what occurs during and after wars that attention may be directed to the long span of some of these tables."

Chicago (Ill.) Pneumatic Tool Company announces the discontinuance of its offices at Wichita, Kan. F. V. Sargent has been appointed district manager of sales in the Boston territory, succeeding F. S. Eggleston with headquarters at 182 High Street Boston. The company also announces the removal of its Milwaukee office from Room 1305 Majestic Building to Room 1418 in the same building, where more convenient quarters necessitated by the growing business of the company in that district have been obtained.

Standard Refractories Company, Claysburg, Pa., manufacturer of silica brick and other refractories, recently issued \$500,000 ten-year 6 per cent first mortgage bonds for the purpose of refunding a small bond issue now outstanding, also for permanently funding additions made to the plant during the war period, to purchase a ganister property which the company is now operating and to add to the plant a complete machine shop and warehouse. It is not the intention of proceeding at once, however, with the building of the new machine shop and warehouse, but this will likely be done later this year.

Holden & White, Inc., Chicago, report a constantly increasing sale of Perry-Hartman side and center bearings. As indicative of the activity among railroads in purchases of these lines, recently orders for these bearings have been received from the following railroads: Chambersburg, Green-castle & Waynesboro Street Railway; West Helena Consolidated Railway; Lehigh Valley Transit Company; Eastern Texas Traction Company; Southern Cambria Railway; Evanston Railway; Easton Transit Company; Douglas Traction & Light Company; Lynchburg Traction & Light Company; Harrisburg Railways; Orange County Traction Company; Conestoga Traction Company; Oakland, Antioch & Eastern Railway; Eastern Pennsylvania Railways; Burlington County Transit Company. It is stated that these bearings have been purchased largely because of the reduction in flange and wheel wear which they effect.

### New Advertising Literature

Corliss Carbon Company, Bradford, Pa.; Bulletin No. 6 giving data on motor and generator brushes.

Condit Electrical Manufacturing Company, South Boston, Mass.; Bulletin No. 440, describing type N-2 fused oil switches.

International Steel Tie Company, Cleveland, Ohio: A folder on "Crossing Frog Costs," attaching a blue print inquiry sheet for quotations.

Schweitzer & Conrad, Inc., Chicago, Ill.: Catalog entitled "High Voltage Protective and Switching Equipment," divided into five sections covering fuses and switches, circuit breakers, cutouts, lightning arresters and relays.