

# Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 53

New York, Saturday, March 8, 1919

Number 10

## Will the Automobile Supplant the Electric Car?

**R**ECENT figures of the registration of automobiles in the United States during 1918 discloses the notable fact that there were in that year 5,945,442 automobiles registered. This is an average of more than one automobile to every twenty inhabitants for the country as a whole. Even more noteworthy than these aggregate figures is the increase during the last few years, since the number of registrations in 1915 was only 2,423,788 or only about 40 per cent of those in 1918. This means that the annual increase of cars in active service during the past three years have been at the rate of more than 1,000,000 cars, and this in spite of the fact that for two years of that time this country was engaged in war. It is in this increase in independently driven vehicles that one reason for the falling off in traffic on the electric lines of this country must undoubtedly be found.

What significance do these figures carry to the electric railway companies? Do they mean that the electric car is becoming obsolete for city or interurban service and will soon be superseded in large part by the private or public automobile? We think not, for reasons which have already been given at length in these columns. Nevertheless, everyone should realize that people purchase automobiles to use them and that superior attractions must be offered by the electric railways to make the automobile rider patronize the electric car. In our opinion, this situation is a strong argument for frequent electric railway service with light high-speed cars.

There are several optimistic conclusions to be drawn from the large number of automobiles in this country. One is that their very number, which is constantly increasing, must hasten the adoption of regulations controlling their use, particularly in city streets. Many of the larger cities in this country now have stringent rules regarding the use of certain busy streets in the downtown districts by automobiles, forbidding the parking of automobiles in certain sections except for limited periods, etc. These rules will have to become stricter and more widespread with the increase in the number of cars, or all street traffic will be blocked. But it is fair to conclude that the right-of-way will always have to be given to the electric car, partly because of its common carrier character and partly because it is the most economical in space per passenger carried of all the users of the streets. Hence, it may soon develop that the electric car will be a more speedy as well as a more convenient carrier in city transportation for the average length of ride than even the private high-

powered limousine or sedan, and it will always be cheaper to operate per passenger than any automobile.

We are glad, in this connection, that the Transportation & Traffic Association is planning at its October convention to give special attention to two problems which are especially involved in automobile competition, namely, the use of safety cars considered from the transportation standpoint and traffic regulations designed to promote greater reliability of electric railway schedules.

## Testing Unskilled Workmen as a Means for Combating Lack of Efficiency

**I**N A RECENT editorial we called attention to the decrease in productive ability of unskilled workmen despite increases in wages. It was stated incidentally that many wage earners seem not to think it necessary to earn more when paid more. Now there certainly must be some point beyond which no employer can afford to go in making wage increases if production is either to stand still or, as often seems to be the case, to decrease somewhat according to an inverse ratio. Production cannot be allowed to decrease, hence employers must do something to counteract the tendency referred to. One way of doing this is to exercise more care in the selection of men, particularly for work which does not require great skill. This is a part of human engineering which in the past has not had the attention which it deserves.

The situation was clearly presented in a letter from A. G. Drury of Cincinnati, Ohio, printed in the July 13, 1918, issue of this paper. Mr. Drury carefully rated the production of laborers digging a standard-size gas trench under similar soil conditions and over a period of four years, or from 1914 to 1917 inclusive. He found that the effectiveness of the men decreased 23 per cent during that period, with a sharp decrease of 11 per cent between 1916 and 1917. Wages were increased 20 per cent during that period, the last year of which was, of course, our first year of war. The important point to be noted here is that the men were probably not so strong or able bodied in 1917 as in 1914, due, of course, to the fact that the more able-bodied and younger men were going to the front or were seeking jobs in munitions and other war work. The men secured in their places simply could not keep up the pace required to maintain satisfactory production.

The above facts should lead to the study of the economy which would result if some physical tests were required of laborers, say to cover stature, alertness and

other desirable characteristics. Perhaps the railways may yet find that they should test laborers just as they now test trainmen, motormen and employees of other classes. In other words, the laborer should be selected for his capacity to do work intelligently rather than just because seemingly he can wield a pick and shovel. The joke about the wheelbarrow being a piece of machinery always provokes a laugh, but it requires a sturdy man to handle a loaded wheelbarrow all day long, and it is far from economical to expect undersized old men and mere boys to do men's work of this kind. Such false economy should be abandoned, and the needed steps should be taken to secure able-bodied efficiency in doing ordinary work about the electric railway.

### Skilled Labor Must Be Selected Carefully Also

WHAT is true in the case of the unskilled laborer applies to the mechanic or other skilled workman whose productive ability has fallen off also in spite of large wage increases. Electric railways of fair size require skilled employees in many lines of work, and under prevailing conditions it has been difficult to secure them. The railways have not been able to offer the highest wages for skilled employment although this handicap is partly offset by the steady character of the work.

In order to get good work done, some tests should be applied to men who claim to possess skill to determine their fitness for the specific lines which they desire to enter. This accomplished, the next step is to make it apparent that lack of training for their work will not only prevent employment at first-rate wages but will hinder advancement. Men who are taken on as helpers or in other grades of work lower than that of first-class workmen must understand that to receive good wages they must develop their ability to advance to higher grades. To some degree the training needed for advancement must be provided by the employer and this to an extent much larger than has been the rule. It will probably even be necessary to pay the men while training, just as motormen and conductors are now paid as "students."

P. T. Clayton, clerk of the House committee on labor of the Sixty-fourth Congress, states that six reasons for inefficiency in production are these: Power failures, equipment and repair failures and limitations, lack of instructions, lack of training, failure to supply materials and lack of an effective personnel. Of these the employer can or should control the first, second, third and fifth. He must begin to supply the fourth. The sixth element has been found to be negligible as compared with the others in an examination of a plant which has a very high reputation for efficiency. Here it was found that the men produced but 35 per cent of what they could readily have produced but for the impedance caused by the factors mentioned. The output usually consisted of three hours' value for nine hours' work.

If the foregoing case is typical, it shows that there is a great opportunity for bringing up production. Aside from the investigation of the needs for improvement in plant, power and material supply, the employer

must take steps to see that proper superintendence and instructions are provided. Above all the selection and training of employees must be made the subject of special study.

### There's a Fine Chance Now for Good Engineering

ONE of the partial compensations for the destruction of property caused by the war has been the realization that preventable wastes which had been going on for years would have to be reduced. And they have been reduced, or it would not have been possible to do what has been done lately in the electric railway and other fields. Any person who has a practicable plan for accomplishing any saving now is sure of a hearing, as was illustrated by the way in which the Central Electric Railway Association listened to and discussed a paper by G. H. Kelsay on "Power House Economics," at the Cleveland meeting last week. The speaker cited so many instances in which savings, large and small, could be made that one member in discussing the paper said humorously that if they could all be put in force power could be obtained for almost nothing. Mr. Kelsay covered ground which has been familiar to engineers for a long time, but it has not always been possible heretofore for them to obtain the savings that their better judgment told them ought to be had. Furthermore, he showed clearly that a few simple instruments will furnish the equipment necessary for intelligent operation of a power plant, given which it is necessary only to apply sufficient brain power and a reasonable amount of money to insure good results.

It is very apparent, when one considers the ways in which power plant savings are to be made, that real engineers are needed in the power department. Such men are not found in large numbers on electric railway properties for several reasons. They and their work have been considered in many instances an unnecessary refinement as long as the "practical" men could keep the plants going. Hence the compensation offered, if offered at all, has not been attractive compared with the possible earnings in construction, engineering sales work, manufacturing and the like. In fact, the manufacturers have been far ahead of the operators in their appreciation of engineering talent and training. Another thing is that the engineer has often felt himself circumscribed as to opportunity for advancement to executive positions. Such opportunity, even if advantage is not taken of it, is one of the greatest possible incentives to initiative and enterprise. After all, an ambitious, rising man is the only kind that is worth while in any position of potential importance.

Now a man of the rising type is not expensive, at any reasonable salary, if he can bring about the savings which Mr. Kelsay has listed. After he secures these he will look around and find "more worlds to conquer." This is a fine time to give the engineer a chance to show what he can do. He ought to make an excellent showing, particularly in view of the facts that fuel is high in price and poor in quality and that it will probably never reach the price level which prevailed during the pre-war period.

## Keep the Tracks Clear from Vehicles as Well as Snow.

WE HAVE already referred to the intention of the Transportation & Traffic Association to appoint a committee to report at the October convention on the subject of a code of principles designed to promote reliability of railway schedules. No subject in the transportation field demands more prompt and thorough attention by a committee than this. While a code of principles in itself will not clear the tracks of obstructions, we have no doubt that discussion of this very important topic will lead to effective education of the public and the authorities who have to do with highway regulation.

Unusually favorable weather conditions in the past few months have been a Godsend to the suffering street railway companies and undoubtedly have been the means through which some companies have kept out of receivers' hands. In fact, it is only by contrast with the storm blockades of last winter that a proper realization can be had of the beneficial effects of a clear right-of-way. In a lesser degree the helpful results from efficient traffic regulation in all kinds of weather are shown in such cities as Cleveland, where the people have been so insistent on keeping down the cost of service that they have learned to appreciate the value of unimpeded movement of the street cars.

In a very elaborate report made a few years ago by the Chicago Traction & Subway Commission there was presented a classification for one year of reported delays of more than five minutes' duration on the surface lines of that city. This showed a total of 9104 delays, amounting to 126,143 minutes, which included only cases reported to the switchboard calling for wreck-wagon assistance or other company supervision, and not referring to the much larger number of minor delays which were cleared up without such help. Analysis of these reported delays showed that in more than 50 per cent of the cases the company was not responsible. The conclusion of the commission was that "this subject is a matter purely for police regulation, but it is pointed out as an important item in the securing of satisfactory service to the traveling public. Delays of ten or fifteen minutes, particularly on long routes, such as the through routes used in this city, necessarily break up the uniform interval that should obtain between cars of the same route."

Avoidable interruptions to service are common on all large city railway properties. Cars are sent out from the depots on time, and their operators earnestly endeavor to maintain a schedule laid out to cover each and every run. Every day they run into unforeseen delays such as blockades at railroad crossings, tie-ups due to wagons and other vehicles breaking down on the tracks, wires down, fire hose across the tracks, etc. The result to the company is more costly operation for non-productive car-hours and the loss of traffic which could be retained if the cars moved on time. The effect on car patrons is irritability of temper and the loss of many valuable hours.

Delay-proof schedules are, of course, not to be expected, but proper co-operation on the part of the authorities and the general public is bound to minimize to a great extent interruptions to service. During the past year there has been much discussion of cost-of-service, and we believe the time is ripe when the car patrons should have brought home to them a full under-

standing of the items which make it necessary to request a higher transportation charge. We hope a workable code of principles may be developed speedily through the T. & T. Association and that its results will be beneficial.

## Electric Railways Should Not Be Asked to Subsidize Their Competitors

OF ALL THE CRIMES ever committed against the car rider, that is the crime of crimes, making him pay for another man's pavement. There is one thing the Legislature of this State should do this winter, it should repeal every act that commands a transportation company to put down one paving stone in any street or road in the State of Massachusetts." This is the forceful way in which Peter Witt stated the case of public burdens borne by railway companies, in a recent address before the New England Street Railway Club. In equally strong language Mr. Witt condemned the practice of requiring these companies to sprinkle their right-of-way.

The subject of making the car rider pay for non-transportation charges is one which will not down. For years the transportation companies—which in the final analysis means the passengers—carried such burdens without complaint. Originally, of course, there was justice in such requirements because in the horse-car days the companies were responsible for stirring up dust as well as for wearing out the pavement between the rails. With the advent of cable and electric cars, however, this was no longer the case, but the companies were making money and there was no special reason for seeking to lift unwarranted charges from the nickel fare. Then came the time for resorting to every possible economy, and public service commissions began to see the unfairness of this old practice. The necessity for a change was especially evident where service was being provided at cost.

There is more and more talk of laying general taxes to aid the car rider. This subject was emphasized in a recent recommendation of the Massachusetts commission to the State Legislature, wherein it was proposed that the deficit arising from operation with a not unduly high fare should be met by a tax levy. This is an indication of a growing understanding of the fact that adequate transportation facilities are a necessity not only to the regular passengers but to the community as a whole. This is a theory which we believe will find more supporters as time goes on. Likewise, we look for a more general adoption of the policy established by Mr. Witt in Cleveland of having adjacent property owners pay for street railway extensions until the new lines are on a self-supporting basis. There is surely more equity in such a practice than in the provisions of the Chicago ordinance which require the building of some 20 miles of new extensions each year regardless of traffic demands and with no direct financial assistance from the property owners who are benefited.

State commissions and municipalities should give careful consideration to these suggestions. No one will accuse the authorities of being over-zealous to grant higher rates to public utilities, and they will find less necessity for advancing rates if all unwarranted burdens are first removed from the cost of transportation.

# The Zone Fare in Practice—Glasgow

By WALTER JACKSON

This Section Describes the Layout of the Tramway System, the Service on Different Lines as Regards Speed and Headways and the Application of the Zone or Graded Fare—How the Combination of Service and Zone Fares Has Produced the Extraordinary Traffic of Nearly Twenty Passengers per Car-Mile Due to the Great Proportion of Short-Haul Riders

## PART TWO

### *Extent of System; Character of Service and Riding; Fares*

**F**EW electric railway systems, private or municipal, can show such an excellent financial and operating record as the Glasgow Corporation Tramways. Indeed, the Glasgow system was well known in the United States more than a decade ago when James Dalrymple, then and now its general manager, was invited to help solve the Chicago traction situation during the term of Mayor Dunne. Therefore, the operating standards of Glasgow have long been considered as embodying the best principles that British tramway practices have to offer. In some respects, especially car equipment, we may have little to learn; but in such basic matters as frequency of service and fares that almost eliminate walking, there may be much from which we can benefit.

#### HISTORY AND GROWTH OF THE TRAMWAYS

Glasgow's first tramway line was constructed by the municipality and opened for traffic on Aug. 19, 1872. In 1871 the city had leased the privilege of operating any tramways to be constructed to the Glasgow Tramway & Omnibus Company for a period of twenty-three years, or to 1894. Five years before the expiration of this lease negotiations were opened for its renewal. However, the elections of 1890 and 1891 showed so strong a sentiment for complete municipal control that the municipality resolved on Nov. 12, 1891, under the power conferred by the tramways act of 1870, to undertake the operation of the tramways itself. The municipality offered to take over, at a valuation, as a going concern, the whole of the company's heritable property, horses, plant and general equipment on the termination of the lease. This offer was not entertained, and the city had to build depots and obtain the necessary staff and equipment before July 1, 1894.

The first electrified line was opened on Oct. 13, 1898, and the last horse car had disappeared by the end of April, 1902. Aside from the expenditures directly due to electrification, such as power house and substations, distributing system and rolling stock, the municipality has continually been raising its track standards to keep pace with its heavy traffic. For this reason, the 79-lb. girder rail of the 1894 period has been succeeded by heavier rails until the attainment of the present standard—a 110-lb. rail laid in 60-ft. lengths, 4-ft. 7½-in. gage, on a bed of Portland cement concrete 6 in. deep and extending 18 in. beyond the outer rails.

By the time the Glasgow Corporation Tramways had electrified its lines, it had written off the complete investment in horse traction, and the fiscal year ending May 31, 1917, saw the conclusion of payments to sinking fund and interest on capital for the electrical investment. For this reason, the report for the fiscal year ending May 31, 1918, shows only the following non-operating accounts: depreciation, permanent way renewals, parliamentary expenses, income tax and proportion of traffic receipts due the Paisley District Tramways Company, Ltd. It is largely because of this wonderful record that the Glasgow system has not found it necessary to raise the rates of fare during the war and reconstruction eras, and, in fact, even paid over to the general municipal fund termed the Common Good the sum of £177,552!

When the city took over the lease, Glasgow had only 60 miles of single track. Now it has 196 miles and as soon as materials are obtainable it is prepared to add 42½ miles, making 238 miles of single track in all. Of the total length of the tramways made and authorized, about 25 per cent is outside the present enlarged city limits, extending into the burghs of Clydebank, Renfrew, Paisley and Rutherglen, and into the counties of Lenark and Renfrew. The city forms practically one community with most of these places, and it has consequently been glad to accord them the same facilities as to the citizens of Glasgow. The layout of the existing electric railways is shown in an accompanying map. This map also shows the routing of the steam and cable belt lines described later.

#### THROUGH ROUTING AND TURNBACK PRACTICES

Practically all routes are double-track, run through from one end of the system to the other, and are amply provided with cross-overs, both at the terminals and along the routes, to insure the utmost flexibility of service. Because of the cultivation of the short rider, even in the outer districts, the turning back of non-tripper cars is not extensively employed except at or near the city limits where there may be a sharp falling-off in traffic. For example, the Paisley-Uddingston line, which is 14½ miles long, has a two-minute service on the 4½-mile section between Tollcross and Ibrox; a six-minute service between Ibrox and Paisley and an eight-minute service between Tollcross and Uddingston. In

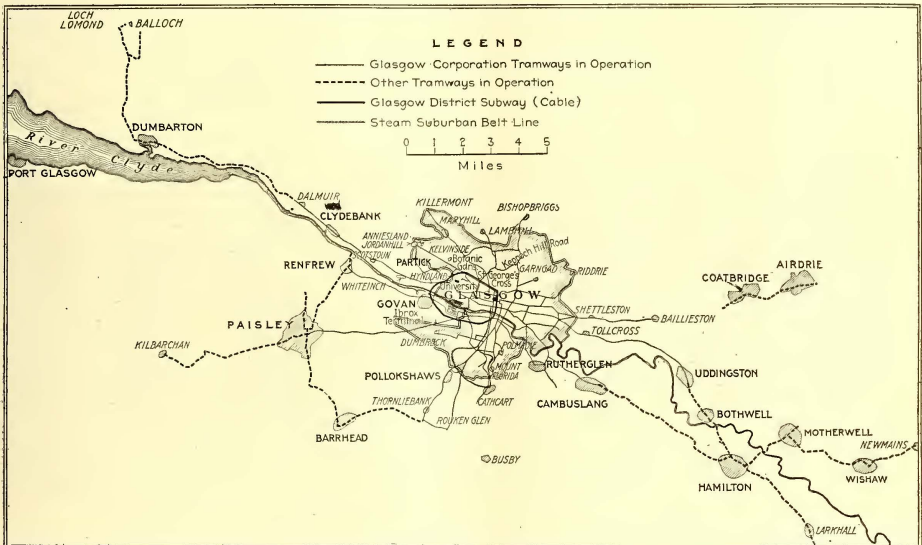
such instances the only complaint comes from terminus riders who find that they cannot board through cars sometimes because the latter may be crowded with short-haul riders. The through rider is less inclined than Americans to board a short-line car and then get on a following through car at the city line because this means a second fare transaction instead of the presentation of a transfer ticket.

To carry 430,946,566 passengers during the last fiscal year, the Tramways operated 26,261,231 car-miles with 861 cars, leading to the high average of 16.41 passengers per car-mile. This density, because of growth of traffic and war shortage of cars, reached the extraordinary figure of 20.33 passengers per car-mile for the week ended Dec. 14, 1918. Actually the number of cars in use is 750 on weekdays, 800 on Saturdays, 560 on

hundred feet of each other. Every car carries on the inside bulkhead a schedule of the fares between all the stages on the route.

The spacing of the fare boundaries is not affected by the density of travel in given sections. Such variations as occur are due to the desire to place the fare boundary at the natural traffic-gathering points along each route. These boundaries are indicated by enameled signs carried on the trolley poles, if convenient, or on metal standards as illustrated on page 452.

The maximum fare to-day is 4 pence, as shown by the reproduction of the eight denominations of fare tickets used at Glasgow. The detail of the conductor's and auditor's duties in connection with the accounting of zone fares will be presented later. It will suffice to state here that the regular passenger simply calls for a



LOCAL TRANSPORTATION LINES OF GLASGOW DISTRICT, SHOWING MUNICIPAL AND OTHER TRAMWAY LINES, STEAM SUBURBAN BELT LINE AND UNDERGROUND CABLE BELT LINE

summer Sundays and 500 on winter Sundays. As many as ninety-six cars were off the schedule at one time.

The present rates of fare, whereby the half-penny (1 cent) stage was lengthened from about 1/3 mile to an average of 1.16 miles, were instituted in December, 1911. This is also the minimum fare for children between the ages of five and fifteen years, although half-fare is permissible otherwise. Up to 1902, workmen got a three half-pence (3 cents) ride for 1 penny before 7 a.m. and between 5 and 6:30 p.m. With so low a base fare as a half-penny, the complexity of such discriminatory fares, of transfers and of overlaps is eliminated. With a distance charge in vogue, the transfer is unnecessary as it makes no difference whether the passenger is going to continue in the same general direction, to the right or to the left. He simply pays for what he gets. As for overlaps, there are only two in all Glasgow. These occur at a junction where the boundaries of several routes happen to come within a few

fare of a given denomination while the stranger mentions his destination first. In each case, the passenger on paying fare receives a fare receipt for the same amount. This receipt is torn off of a nailed pad. The conductor then inserts the ticket in a bell punch and counter in order to perforate the section of the ticket which shows the limit to which the passenger is entitled to ride. Fares are collected only within the car. In fact, the conductors are instructed not to impede speed of entrance and exit by collecting fares on the platform.

While no figures on the rate of passenger interchange are available, it is obvious to the observer that it must be very quick as two persons can readily board or leave the car at the same time by way of the rear platform, which is the only one available for the passengers. As the average step height is about 12 in., it is not uncommon to see women with babes in arms jumping on and off moving cars. Needless to say, this practice is not

encouraged as it is a prolific source of accidents. By far the greater number of passengers tender cash. However, fiber disks (celluloid before the war), blue for half-penny fares and white for penny fares, may be purchased at full price in quantities of 5 shillings (\$1.25) or more. These tokens are bought chiefly by the post office, by warehousemen and other large employers who have employees doing considerable riding on business.

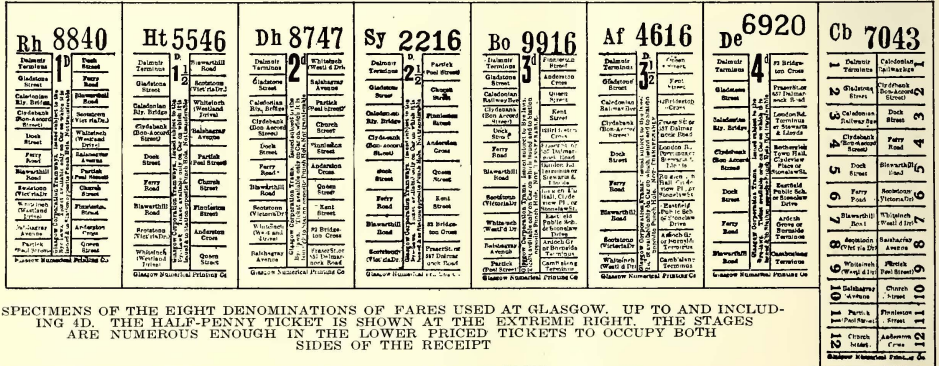
The construction of the cars prohibits front-end fare collection with the aid of a second conductor, nor have any prepayment areas at factories been considered necessary. Loading in queues is practiced only occasionally at summer resorts.

It might be supposed that fare collection and change-making would be a rather cumbersome process. As a matter of fact, it is not because copper coins appear to be so plentiful. From time to time, passengers have been urged through car posters or newspaper advertisements to present the exact fare—particularly when women conductors came in—and it is evident that a large proportion do so. One permanently effective in-

gers, have increased with the advent of women conductors. This may be ascribed partly to their lack of experience and partly to the feeling that when war conditions are settled they will return to their old pursuits.

To minimize the losses from over-riding, some forty to fifty uniformed men are employed as ticket inspectors. As indicated by the form shown on the opposite page their duty is to board cars within a given section or beat, at discretion, to examine the conductor's waybill or trip sheet and the receipts of the passengers to see that they have the proper serial numbers on their tickets or that they are not riding beyond the place punched thereon. The records show that these men board from forty-four to seventy-seven cars a day and that the average is fifty-five cars. This figure would be greater if the ticket inspector did not have other duties. His report covers boarding and leaving times and places, number of passengers and the conductor's signature. There is also space for remarks.

In case of over-riding detected, the conductor simply requests the passenger to pay for a second fare receipt.



SPECIMENS OF THE EIGHT DENOMINATIONS OF FARES USED AT GLASGOW. UP TO AND INCLUDING 4D. THE HALF-PENNY TICKET IS SHOWN AT THE EXTREME RIGHT. THE STAGES ARE NUMEROUS ENOUGH IN THE LOWER PRICED TICKETS TO OCCUPY BOTH SIDES OF THE RECEIPT

centive to have the exact fare lies in the weight and size of British copper coins, for a passenger does not relish getting change in copper for a coin no greater than 2 shillings.

Once the passenger has received his fare receipt with its identifying serial number he is expected to keep it for visé any time during the trip, either by the conductor or a ticket inspector. This is really no different in principle from the American practice of asking a passenger to hold on to his transfer ticket. In fact, where the prepayment or postpayment system is not used, as on some lines in Brooklyn, many passengers ask for a transfer simply to prove that they have paid fare.

With the zone system, the principal sources of loss are over-riding by the passenger and missed fares. Dishonesty in conductors is made extremely difficult by the receipt system and is punished by instant dismissal. About the only way the conductors could steal would be to re-issue an old ticket, and this is an extremely hazardous undertaking. Missed fares, due to the rapid interchange of traffic on a double-deck car carrying a maximum of sixty-two seated and six standing passen-

If the passenger objects, the conductor may call a policeman to arrest him. No placards are posted to warn against over-riding on the psychological principle that it is not good policy to suggest an evil action. It is worth mentioning that while overriding is common enough, no one dares to use an old receipt a second time as that would be clear evidence of fraud, and not mere forgetfulness.

Long before the paper-saving campaign due to the war, Glasgow passengers were asked to throw their defunct receipts into boxes provided on each side of the platform, but enough of them fail to do it to give the car floors a rather untidy appearance in these days of labor shortage and less exacting platform employees.

NEARLY TWO-THIRDS OF PASSENGERS ARE ONE-ZONE RIDERS

When the half-penny a mile fare was established in December, 1911, there were many who expected the direst results. Instead, the traffic increased at such a rate that the revenue per car-mile showed a slight decrease only the first year or so. Thereafter it exceeded the former figures as shown in Table I.

TABLE I—GLASGOW TRAFFIC RETURNS SINCE MAY 31, 1911

Year to May 31	Cars in Use		Passengers	Receipts	Dence per Car-Mile
	Sixteen-Hours Daily	Car Mileage			
1911-1912	582.19	22,435,076	275,610,385	£987,280	10.56
1912-1913	606.04	23,333,006	311,480,086	1,007,652	10.36
1913-1914	629.69	24,403,462	336,654,624	1,078,691	10.61
1914-1915	638.20	24,214,460	336,267,758	1,070,694	10.61
1915-1916	650.65	24,963,309	362,371,464	1,149,264	11.05
1916-1917	674.51	25,786,047	388,294,876	1,245,507	11.59
1917-1918	685.01	26,261,231	430,946,566	1,404,110	12.83

TABLE II—NUMBER OF AND REVENUE FROM EACH CLASS OF PASSENGERS, YEAR ENDED MAY 31, 1918

Fare	Passengers Carried		Traffic Receipts	
	Number	Per Cent	Amount	Per Cent
1d.	272,902,138	63.33	£568,546	40.49
1d.	110,608,645	25.67	460,869	32.82
1d.	28,462,112	6.60	177,888	12.67
2d.	9,332,956	2.16	77,774	5.54
2d.	4,351,666	1.01	45,329	3.23
3d. and upward	5,289,049	1.23	73,301	5.22
Sundries*			400	0.83
<b>Total</b>	<b>430,946,566</b>	<b>100.00</b>	<b>£1,404,110</b>	<b>100.00</b>

\* Principally chartered cars.

The overwhelmingly large proportion of riders who travel a mile or less is directly indicated for the whole system in Table II. These figures are, of course, derived from the sales of tickets and do not indicate the relative density of travel along different portions of each route. No surveys with that end in view have been made in recent years.

However, nothing is more

obvious to the observer in Glasgow than the heavy pick-up or in-between travel. The ratio of the different classes of riders both in numerical and revenue relations is also most effectively shown in two accompanying diagrams reproduced from the official report for the fiscal year ended May 31, 1918.

No. of Cars Checked, ..... Reports, .....

**GLASGOW CORPORATION TRAMWAYS**

Ticket Inspector's Report for ..... day, the ..... day of .....

Station	Time	Inspector's Remarks	Journal Class	Passengers	Left Car at	Remarks

FORM OF REPORT MADE BY TICKET (FARE RECEIPT) INSPECTOR

It must be clear that the consequence of such travel as this will be reflected in the passengers per car-mile statistics, and it surely is. For the fiscal year ending May 31 last, the number of passengers per car-mile for the entire system was 16.41 with nearly twenty-three passengers per car-mile on the Paisley Road and Alexandra Park line! The average passengers per car-mile for the week ending Dec. 14, covering the entire Glasgow system, reached 20.33. American operators who check these figures against their own will wonder whether the zone system can be so complex as assumed, if it is capable of handling such dense traffic. Statistics alone do not tell the story. A few typical incidents may be quoted to bring out the short-ride habit among a people who have never had a reputation for wasting their money. Apparently, car riding is considered cheaper than shoe leather. On a trip inbound from Scotstoun to Glasgow between 11 and 11:30 a.m., the writer observed that a soldier and himself were the only males on the car. Even the crew were women. Many of the passengers were women with empty market baskets who actually rode half a mile or less. Here was little more than shopping travel, yet the car changed its load twice in four zones or less. Evidently for every Glasgow man who goes to work someone is left at home to do the marketing; and under the Glasgow combination of short-ride fares and frequent service, the homekeeper rides quite as often as the wage earner.

On trips taken in the industrial sections during the noon hours, a conspicuously large proportion of the riders were grime-covered workmen who were traveling to and from lunch as a matter of course. Later in the afternoon, the travelers were women shoppers and school children. Again and again, one was struck by the contrast between empty sidewalks and loaded cars which were running on a two- to three-minute headway. Those who have noted the wonderful increase of traffic produced in stagnant American communities through the inauguration of additional

service with one-man automatic cars will agree that the extremely short headways prevalent in Glasgow are entitled to some credit for the heavy travel. Thus a person who starts to walk along the first outbound zone along Jamaica Street will be passed by cars at the rate of 145 an hour and even in the second fare zone outward bound he will be passed by cars at the rate of one or more every minute. Almost anywhere within a mile of the center of the city, there is at least one car every minute. Under such circumstances, who will be hard-fisted enough to walk? As shown in the Table III, two-, three- and four-minute headways on individual lines are the rule, while the longest headway is only twelve minutes. The Finnieston line is the only one-man car service on the system. That riding is heavy regardless of the wealth of the inhabitants may be gathered from the fact that the Dumbreck line serves a residential section of high grade; Botanic Garden, a residential section in the west and a workmen's district in the east; Netherlee, a district of business men and clerks, overlapping with the Langside line for a two-minute combined service for 4 miles; Dalmeir-London Road and Dalmeir-Rutherglen, serves the principal industrial plants along the Clyde and adjacent thereto.

No more striking examples of the effect of short-haul riding on the amount and variation in traffic throughout the day could be furnished than the accompanying four graphs, which are from a series prepared by the Glasgow Corporation Tramways in January, 1917,

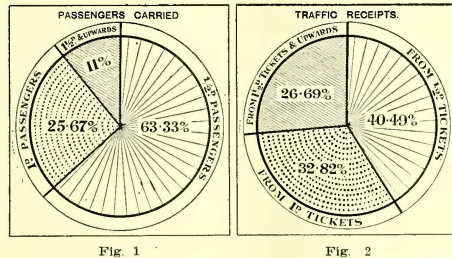
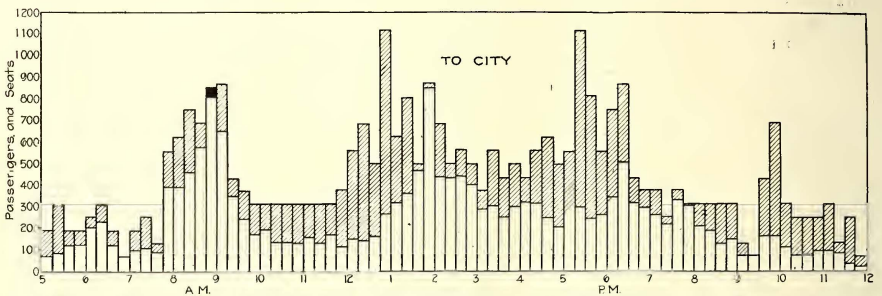
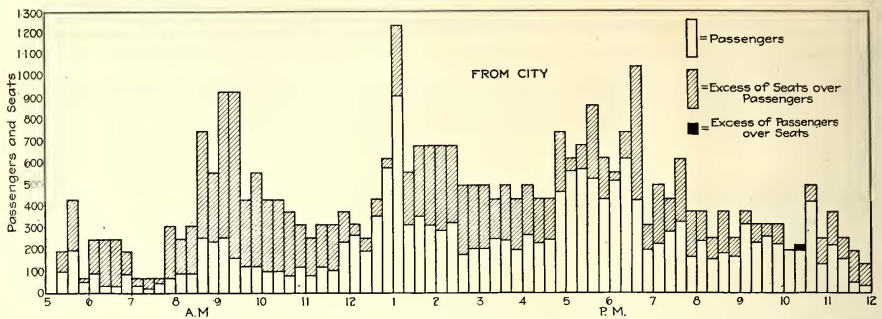
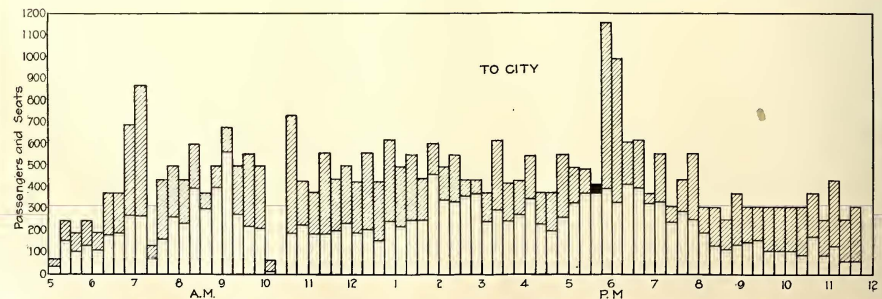
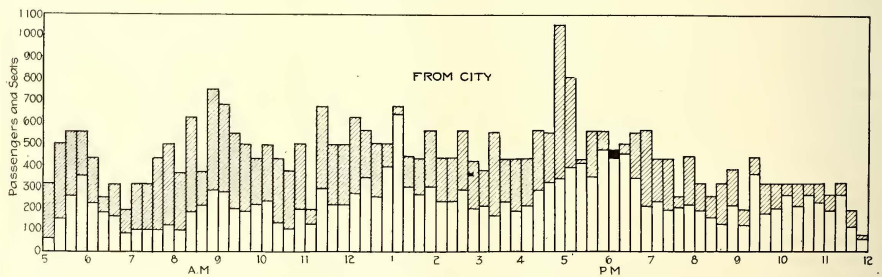


FIG. 1.—RELATION OF DIFFERENT CLASSES OF PASSENGERS TO TOTAL CARRIED. FIG. 2.—RELATION OF PASSENGER CLASSIFICATION TO RECEIPTS



CENSUS OF PASSENGERS CARRIED AND SEATING ACCOMMODATIONS TAKEN DURING FIFTEEN-MINUTE PERIODS ON DUKE STREET EAST OF HIGH STREET, THURSDAY, JAN. 11, 1917. FOR HOURLY FIGURES SEE TABLE IV



CENSUS OF PASSENGERS CARRIED AND SEATING ACCOMMODATIONS TAKEN DURING FIFTEEN-MINUTE PERIODS TAKEN ON ARGYLE STREET, WEST OF ANDERSTON CROSS, TUESDAY, JAN. 16, 1917. FOR HOURLY FIGURES SEE TABLE V



to determine the relation between seats furnished and passengers carried. The corresponding tables are Tables IV and V. At the time mentioned (January, 1917) the increase of traffic without new cars shows a less favorable relation of seats to passengers, but the service is still being carried out according to the rule of twenty-four passengers on the lower deck with six standees permissible and thirty-eight passengers on the upper deck with no standees. Usually, when capacity has been reached, the conductor lowers a "Full" sign from the hood and directly over the step. Only at the discretion of the traffic officer on special occasions, like blockades, in the standee rule broadened.

Referring now to the first two graphs, with corresponding Table IV, it will be noted that they show the inbound and outbound traffic respectively on Thursday, Jan. 11, 1917, at Duke Street, east of High Street, a point 1 mile from Jamaica Street, which is the traffic center of Glasgow. The cars charted on these records serve a clerical and working-class section. The reader will at once note the startling difference from daily load records of large American cities. The first point to attract attention is the midway travel which outbound reaches its maximum at 1 p.m. and inbound at 2 p.m. The workers of Glasgow have every encouragement to ride home for lunch when for 1 penny they can ride out for 2 miles without waiting more than a minute or two for a car. Luncheon hours are fairly well staggered. Like some private employers the Glasgow municipality encourages home eating by granting a one and one-half-hour luncheon period. It believes that this makes for greater efficiency than obliging its women employees, in particular, to depend upon restaurants. Glasgow office hours are generally 9 a.m. to 5 p.m. daily and to 1 o'clock on Saturdays. Shopkeepers have their half-holiday on Tuesday afternoons.

Further checking of the afternoon hours of both the inbound and outbound graphs shows an excellent traffic due almost entirely to women shoppers, school children, agents, commercial travelers, etc. Because of the continuance of short-headway service, the evening peak outbound is nowhere nearly as severe as where the let-down of midway service imposes much of this miscellaneous travel on the rush hours.

The second pair of graphs and corresponding Table V were derived from data taken at Argyle Street west of Anderston Cross and 1/2 miles from Jamaica Street. These graphs cover working-class travel almost entirely.

TABLE III—WEEK-DAY ROUTES AND SERVICES, GLASGOW CORPORATION TRAMWAYS

Route	Service in Minutes							
	5.18	7.29	4	5	4	5	4	5
Botanic Gardens and Outlands..	4.99	7.48	6	6	6	6	6	6
Dumbreck and University.....	7.74	8.15	2	3	2	3	2	3
Netherlee and Kirkcaldy.....								
Langside and Hyndland } Hynd-	4.57	8.06	8	8	8	8	8	8
land.....	12.15	8.35	2	3	2	3	2	3
Rouken Glen and Bishopbriggs..	4.49	7.72	6	6	6	6	6	6
Paisley Road and Alexander Park	14.74	8.98	2	3	2	3	2	3
Uddingston and Paisley.....	8.19	8.39	3	3	3	3	3	3
Renfrew and Lambhill.....	9.91	8.16	6	6	6	6	6	6
Cambsusland and Anniesland....	12.42	8.87	2	2	2	2	2	2
Dalmuir and Buzelglen } Dalmuir and London Road } ..	8.96	8.40	4	4	4	4	4	4
Burnside and Springburn.....	7.25	8.21	2	3	2	3	2	3
Anniesland and Dennistoun.....	6.06	7.45	6	6	6	6	6	6
Newlands and Maryhill.....	4.88	7.51	6	8	6	8	6	8
Sinclair Drive and Kelvinside	6.73	7.74	4	6	4	6	4	6
Mount Florida and Killermont...}	5.80	8.19	4	6	4	6	4	6
Springburn and Mount Florida..}	3.27	7.85	12	12	12	12	12	12
Garnagad and Palmadie.....	5.21	8.77	7	7	7	7	7	7
Whiteinch and Keppochhill Road	2.56	8.08	6	6	6	6	6	6
Mount Florida and Paisley Road	5.21	8.77	6	6	6	6	6	6
Toll.....	4.65	6.75	10	10	10	10	10	10
Finnieston and Stobocross Ferry...								

The characteristic feature of the inbound travel on this service is the breakfast riding. Many laborers who start work early in the morning will go home a few hours later for breakfast if not too far from their work—another example of traffic promotion through zone fares and short headways like two and one-half and three minutes. It is not difficult to see why the Glasgow Tramways find it easier than American street railways to lay out a fifty-one-fifty-four hour week for platform employees!

STOP SPACING AND SPEED RESTRICTION

Obviously a street railway that wishes to relegate the walking habit among the lost arts must seek the happy medium between too many stops and too few. The peace-time standard averages 600 ft., or between eight and nine per mile, with some spacings as high as 900 ft. to permit less than 600 ft. spacing of traffic-gathering points. To economize coal, 200 out of 1840 single stops were temporarily discontinued except on the extremely busy Paisley Road-Alexander Park belt line where short-ride traffic is so heavy that conductors sell 1400 or more half-penny tickets a day. The saving in coal has not been of any great importance, partly because most of the stops eliminated were not frequently made at any time and partly because the fluctuations in a large power plant are not materially affected by the elimination of a small percentage of stops. Most stops are near side.

"Stop" signs of the style illustrated on page 452

TABLE IV—CHECK TAKEN OF TRAFFIC AT DUKE STREET EAST OF HIGH STREET

Period	From City			To City		
	Cars	Passengers	Seats	Cars	Passengers	Seats
5 a.m. to 6 a.m.	11	353	682	14	392	868
6 a.m. to 7 a.m.	15	246	950	13	629	806
7 a.m. to 8 a.m.	8	151	496	18	621	1,116
8 a.m. to 9 a.m.	30	662	1,860	46	2,277	2,852
9 a.m. to 10 a.m.	46	670	2,852	32	1,408	1,964
10 a.m. to 11 a.m.	25	404	1,550	20	583	1,240
11 a.m. to 12 noon	20	528	1,240	21	572	1,302
12 noon to 1 p.m.	26	1,377	1,612	46	706	2,852
1 p.m. to 2 p.m.	51	1,891	5,162	45	1,985	2,790
2 p.m. to 3 p.m.	38	995	2,536	36	1,706	2,232
3 p.m. to 4 p.m.	30	898	1,860	30	1,143	1,860
4 p.m. to 5 p.m.	35	1,200	2,108	34	1,080	2,108
5 p.m. to 6 p.m.	45	2,095	2,790	49	961	3,038
6 p.m. to 7 p.m.	43	1,768	2,666	39	1,465	2,418
7 p.m. to 8 p.m.	31	1,011	1,922	21	1,118	1,300
8 p.m. to 9 p.m.	20	742	1,240	20	629	1,302
9 p.m. to 10 p.m.	21	1,043	1,302	21	471	1,054
10 p.m. to 11 p.m.	18	968	1,116	17	350	744
11 p.m. to 12 midnight	15	441	950	12	211	744
Total.....	527	17,443	32,674	534	18,405	33,108

TABLE V—CHECK TAKEN OF TRAFFIC AT ARGYLE STREET, WEST OF ANDERSTON CROSS

Period	From City			To City		
	Cars	Passengers	Seats	Cars	Passengers	Seats
5 a.m. to 6 a.m.	31	819	1,922	12	412	744
6 a.m. to 7 a.m.	19	654	1,178	26	736	1,612
7 a.m. to 8 a.m.	25	415	1,550	31	745	1,922
8 a.m. to 9 a.m.	34	770	2,110	31	1,322	1,910
9 a.m. to 10 a.m.	35	863	2,158	36	1,262	2,224
10 a.m. to 11 a.m.	29	666	1,790	20	416	1,220
11 a.m. to 12 noon	30	841	1,840	30	791	1,866
12 noon to 1 p.m.	35	1,253	2,170	33	778	2,020
1 p.m. to 2 p.m.	34	1,491	2,068	34	1,186	2,096
2 p.m. to 3 p.m.	30	947	1,848	31	1,408	1,912
3 p.m. to 4 p.m.	29	794	1,790	30	1,056	1,848
4 p.m. to 5 p.m.	42	1,147	2,592	30	1,040	1,852
5 p.m. to 6 p.m.	38	1,607	2,348	41	1,528	2,518
6 p.m. to 7 p.m.	33	1,453	2,034	42	1,477	2,592
7 p.m. to 8 p.m.	25	835	1,550	30	1,118	1,860
8 p.m. to 9 p.m.	20	669	1,240	20	380	1,240
9 p.m. to 10 p.m.	20	840	1,240	20	522	1,240
10 p.m. to 11 p.m.	20	940	1,240	20	448	1,240
11 p.m. to 12 midnight	13	600	806	16	252	992
Total.....	542	17,604	33,484	533	17,077	32,910

are carried from trolley poles or standards. Stops are regularly made at the zone boundaries, at track intersections and dangerous curves. Near schools it is customary to put up "Drive slowly" signs.

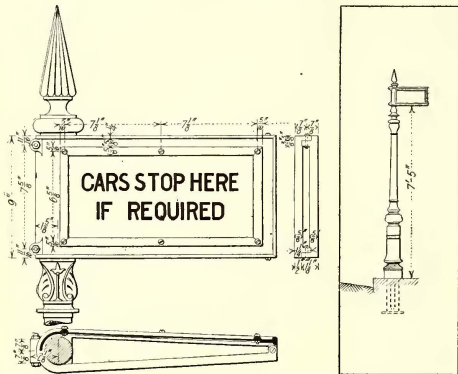
The Glasgow municipality's traffic rules are few and simple. As regards the relation of cars and other vehicles, rule 9 states that the usual plan of keeping to the right in passing another vehicle does not apply when the vehicle is following a street car. In that case, the vehicle desirous of passing the car must go by on the

the "Take One" box in every car also carried a condensed time-table of the line, showing the arrival times at terminals. Boards at the terminals show the times of departure of last cars and the like. The native is still able to pick out his car in daylight by its combination of body and superstructure coloring. Of course, a scheme like this means some extra expense in painting and is likely to be embarrassing when emergency traffic conditions call for the transfer of cars to other routes. All cars are provided with roller-type destination signs, in addition to which some of the cars carry roller-type route number signs—complete equipment having been interrupted by the war. These destination signs are readily visible within easy braking distance during the daytime but they are not directly illuminated. A roller destination sign is also installed on each side of the car interior, while the route of the car is indicated by painted wooden boards on the outer sides of the car.

For the stranger in Glasgow, the Tramways publish a 113-page guide book which is sold for the nominal sum of 6 cents (3 pence). About 500,000 copies had been printed with the issue of the fifth edition. This guide tells the story of Glasgow's past and present glories, route for route, with ample illustrations. A moderate amount of advertising matter helps to defray the cost of publication.

SHELTERS FOR WAITING PASSENGERS

Because of the extremely short headways, the Tramways have not gone extensively into the provision of shelters for waiting passengers. In fact, there are but two on the entire system. At Eglinton Toll Road, the shelter is little more than a glass-partitioned shed forming a flatiron extension of the building at this particular junction. At Catchcart and Battlefield Roads there is a more elaborate structure. This is at the junction of two important roads and in the vicinity of several public institutions. It is finished in tile inside and out and has large glazed areas and benches for waiting passengers. Those who prefer to stand outside have



DETAILS OF STOP AND FARE-STAGE SIGNS CARRIED ON EITHER TROLLEY POLES OR STANDARDS AS CONVENIENT

left except where there is sufficient reason for deviation. Rule 10 states that when a tramway car is standing at a stopping place, every driver of a vehicle who intends to pass on the left or near side of the car shall draw up immediately before arriving at the stopping place until the roadway is clear of passengers entering or leaving such car. It will be understood, of course, that in Great Britain, the standard traffic rule is to keep to the left instead of the right.

In Glasgow there are no special speed restrictions for vehicles making less than 20 m.p.h. The schedule speed of the Glasgow tramway system as a whole is 8.18 m.p.h. which, in view of the dense traffic, and low motoring, is not so much below American speeds as one might expect. In the outer sections, the cars make schedules up to 16 m.p.h., but in the crowded downtown streets it is hard to do better than 4 m.p.h. Hence if part of the downtown travel could be diverted to parallel streets, the increase in schedule speed would make it unnecessary to consider special non-surface rapid transit. The high density of travel keeps the scheduled running times unchanged all day.

To facilitate the movement of traffic, policemen are stationed at all busy corners. While the cars receive no special preference over other vehicles, this traffic officer may pass across an intersection several cars at one time. The traffic control officers are paid directly by the police department.

Of the various means used to apprise the public of tramway facilities, the zone boundary and stop signs in the street and the rate-of-fare cards in the cars, shown on this page, have already been mentioned. Before the paper shortage brought on by the war became acute,

TABLE OF FARES		TO OR FROM	
Springburn and 181 Castle Street.	1d.	Springburn and Glasgow Cross.	1d.
Petershill Road or Gargard Road and Duke Street.	1d.	Petershill Road or Gargard Road and Rutheglen Road.	1d.
181 Castle Street and Glasgow Cross.	1d.	181 Castle Street and Glasgow Cross.	1d.
Cathcart Street and Rutheglen Road.	1d.	Cathcart Street and Glasgow Cross.	1d.
Glasgow Cross and Alkborough Road.	1d.	Rutheglen Road and Glasgow Cross.	1d.
Rutheglen Road and Govanhill (Dixon Avenue) or Polkadee.	1d.	Glasgow Cross and Cathcart Street.	1d.
Alkborough Road and Mount Florida.	1d.	Springburn and Alkborough Road.	1d.
Govanhill (Dixon Avenue) and Cathcart Street.	1d.	Petershill Road or Gargard Road and Govanhill (Dixon Avenue) or Polkadee.	1d.
Mount Florida and Cathcart Terrace.	1d.	181 Castle Street and Mount Florida.	1d.
		Cathcart Street and Cathcart Bridge.	1d.
		Glasgow Cross and Cathcart Terrace.	1d.
		Springburn and Mount Florida.	2d.
		Petershill Road and Cathcart Bridge.	2d.
		181 Castle Street and Cathcart Terrace.	2d.
		Springburn and Cathcart Terrace.	2d.

TABLE OF FARES, AS POSTED ON BULKHEAD OF CARS ON SPRINGBURN-CATHCART ROUTE

the shelter of a wooden marquise. The station includes a news and stationery shop, which, curiously enough, opens out only on the street instead of the waiting room as well. The original plan was to have the stationer act as caretaker in lieu of rental, but later it was decided to have him pay a fixed rental and leave the care of the structure to discharged soldiers who work in two shifts. The cost of this shelter was shared with the

statute labor department which has charge of the public lavatories, but the maintenance is borne entirely by the Tramways.

#### ACCIDENTS AND SAFETY WORK

Like the average American, the people of Glasgow are hustlers and always ready to take a chance to save a minute or two. Therefore, accidents have always been plentiful. In recent years, the decrease in the number of experienced employees, the darkening of the streets for air-raid protection and the more intensive use of the cars available, have aggravated the difficulties. The climatic conditions of Glasgow—especially the long winter nights, the heavy rainfall and the smoke-laden fogs—are not encouraging either.

Previous to June, 1914, the Tramways carried accident insurance through the underwriters at a fixed sum per 1000 car-miles, and in case of an accident it simply turned over to them all papers for a settlement. On deciding to carry the risk itself, the railway started a safety-first campaign along the most approved British and American lines, but the rapid loss of experienced men made it impossible to get the full benefit of such work. This campaign will be renewed, however, when "the boys come home" from the demobilization camps. The value of a safety campaign was quickly demonstrated by the fact that during the first year of the work there was a great increase in the number of accidents reported but not in the number of accidents occurred.

From June, 1914, to June, 1915, there were 2434 boarding and 4281 alighting accidents; from June, 1915, to June, 1916, 1952 boarding and 3623 alighting accidents; from June, 1916, to June, 1917, 1703 boarding and 3541 alighting accidents; from June, 1917, to June, 1918, 1889 boarding and 2842 alighting accidents. Although the number of accidents has decreased, the cost per accident has increased. This is the direct result of war-time wages. Most of the accidents occur to workmen who are receiving greatly increased wages and they reckon the value of lost time accordingly. The higher cost of labor and material has also raised the cost of vehicular collisions. The fact that Glasgow people are intensely proud of their tramways does not deter a certain element from trying to mulct the city with the aid of the ever-ubiquitous ambulance chaser. Litigation of this character is much more costly to the defendant than to the plaintiff.

#### THE NON-TRAMWAY RIDING IN THE GLASGOW DISTRICT

In spite of the extraordinarily heavy riding on the Glasgow Corporation Tramways, two other means of transportation enjoy the patronage of the city. One of these is the Glasgow District Subway, a cable road, and the other is the system of steam suburban lines.

The cable line is operated by the Glasgow Subway Railway Company. It is a double-track belt line, only  $6\frac{1}{2}$  miles long, which encircles the core of Glasgow on both sides of the Clyde River. Trains consisting of a grip car and trailer are operated on a three-minute headway from the starting of the first train at 5 a. m. to midnight. The round trip is made in thirty-five minutes.

Up to December, 1916, the company had a zone

fare which allowed a ride of one station for 3d., of five stations for 1d. and of more than five stations for 1½d. At present, the fare is 1d. for a ride of any length for adults while children under twelve, as before, ride for ½d. That this line has never been able to make much headway against the tramway service is apparent from the fact that its traffic over a long period of years has remained almost stationary whereas the street-car travel has grown enormously. For example, even the war curtailment of tramway service did not bring more than 17,948,170 riders for the year ended Dec. 31, 1917. As long ago as 1908, the cable subway carried 17,206,790 passengers. The receipts in 1917 were £73,413 and in 1908, £68,916, a slight increase per passenger because of the change to a flat or universal fare. The total train mileage for 1917 was 1,180,356 miles or 15.2 passengers per train-mile.

The traffic is not likely to increase greatly, even in case of electrification, as the distances covered are too short to warrant a person going up and down stairways when he can board a surface car within the belt-line territory practically inside a minute! The present owners can hardly be making a fortune, judging by the fact that the preferred shares earned only 2½ per cent during 1917.

Although the necessities of the great war brought about a reduction in the steam railroad suburban service, the competition from this source is by no means negligible. Unfortunately, separate suburban figures are not published. Trains are run at frequent intervals, however, to points within the 10-mile radius, the headway in some cases being as low as ten minutes. In addition to the radial steam lines there is an important double belt line to the south, serving the Langside district. This line is shown on the map on page 447, but the other steam lines are omitted.

The rates on the steam lines are considerably higher than those by tram. The rate to Renfrew, for example, is 7d. by steam and only 2½ to 3d. by tram.

The number of taxicabs and horse cabs in Glasgow has never been proportionately as large as in other big British cities. As for buses, there are none at all. In this connection, the writer asked N. O. Fulton, managing director of the Albion Motor Car Company, Ltd., Scotstoun, Glasgow, why Glasgow had no buses. He replied that the tramway service was too frequent to encourage the idea of competition. In some other cities the buses had taken hold because of unsatisfactory car service or because of congested street conditions and they were fulfilling requirements better than the vehicles which were tied inflexibly to a given line of track. The very short headways, the low fares and the public ownership of Glasgow's tramways had proved great factors in fostering the habit of using the cars—and the habit was one not easily broken.

Although no buses are operated in Glasgow at this time, there is a likelihood that several services will be instituted in the future as auxiliaries rather than competitors of the street car service.

The third, and concluding, article on Glasgow will deal with the type of rolling stock, the transportation employees including supervisory petty officers, the schedule department and the auditing of fare receipts and cash turned in by the conductors.



# Getting Better Economy in the Power House\*

Substantial Savings Are Possible, Particularly in the Boiler Room,  
Where in the Past Some Very Simple Expedients for  
Fuel Saving Have Been Overlooked

By G. H. KELSAY  
Electrical Engineer Union Traction Company of Indiana,  
Anderson, Ind.†

COAL is the source of power for practically all our properties. The United States possesses about one-half the coal supply of the world, sufficient to last us a period ranging from one hundred years to four thousand years. The first period is for a consumption increasing at the present rate, but the coal will last for thousand years at the present annual consumption. We have used to date about one-half per cent of this, as is shown graphically in Fig. 1.

One pound of coal of 11,000 heat units (B.t.u.) has stored in it, heat energy which if it could be changed to mechanical energy would lift a stout man ten miles or its own weight 2000 miles. If the energy in the coal

states that figuratively the boiler is that part of the power plant where "money is burned" to make power. From an economic standpoint it is where the greatest saving can be effected and where the greatest waste is possible. The efficiency of the boiler room may be represented by the formula:

$$E = S \times B \times O$$

where *E* is the over-all efficiency of the boiler room; *S* is the stoker efficiency, affected by design of grate or stoker and furnace, and adaptability of the stoker to the fuel burned; *B* is the boiler efficiency, including boiler and setting; and *O* is the operating efficiency, including that of both firing and maintenance labor.

In his book on "Steam Power Plant Engineering" Gebhardt gives the following as a heat balance for bituminous coal, based on coal as fired for average practice:

	Per Cent of Caloric Value of Coal as Fired
Heat absorbed by boiler	65.0
Loss due to evaporation of free moisture in coal	0.6
Loss due to evaporation of water formed by combustion of hydrogen	4.3
Loss due to heat carried away by dry fine gas	17.5
Loss due to carbon monoxide	4.5
Loss due to combustible in ash and refuse	4.5
Loss due to heating moisture in air	0.3
Loss due to unaccounted for	7.3
Caloric value of coal	100.00

## HIGH ASH CONTENT IN COAL CAUSES SERIOUS LOSSES

The reduction of boiler-room losses should start at the coal mines, as the greatest of these losses results from the high percentage of ash in the coal. This percentage has been subject to very great fluctuation during the past three years on account of the extreme demand for coal. The quality of the coal has not been so good and the coal has been less well adapted to particular plant conditions.

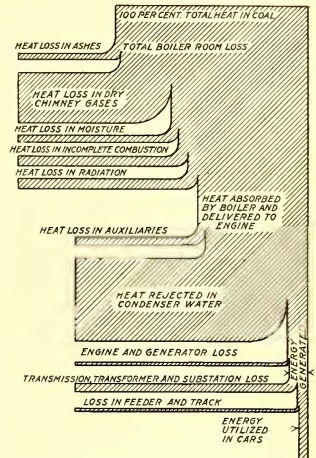


FIG. 2—DIAGRAM SHOWING HOW A LARGE PERCENTAGE OF HEAT IN FUEL IS DISSIPATED

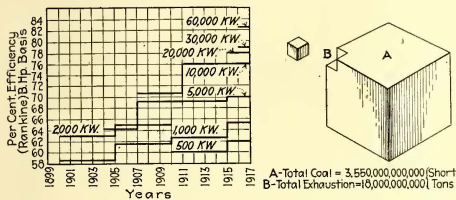
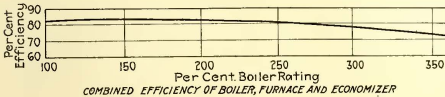


FIG. 1—RELATION OF BOILER LOAD TO EFFICIENCY, INCREASE IN EFFICIENCY OF STEAM TURBINES, AND RELATION OF COAL USED TO AVAILABLE SUPPLY

could be converted directly to mechanical energy at the car wheels, a motorman could easily carry enough coal in his cab to propel his car, and handling it would be no more of a burden than handling baggage.

## HEAT FINDS MANY STRAY PATHS

It is a duty of the operators in the mechanical and electrical departments to make every reasonable effort to deliver energy to the car with the least possible loss, and the purpose of this paper is to call attention to some of the practices that affect the efficiency of this process. Fig. 2 shows in a graphical way how the energy in the coal is consumed and what a small proportion is finally available at the car. The named losses are unpreventable, but they are all subject to decrease through intelligent selection and operation of equipment.

In one of its catalogs the Edge Moor Iron Company

\*Abstract of paper read at annual meeting of Central Electric Railway Association, at Cleveland, Ohio, Feb. 28, 1919.

†On March 1 Mr. Kelsay became superintendent of power and equipment, Cleveland, Southwestern & Columbia Railway, Elyria, Ohio.

The effect of increased ash results in decreased heat value, increased tonnage consumption and increased necessary boiler capacity, as was well illustrated in an article prepared for the National Research Council, by W. A. Shoudy, of the J. G. White Engineering Corporation,\* from which Fig. 3 was taken. Increase in ash content reduces the heat units in the coal; causes greater loss to the ash pit because more heat is carried off in the ashes; results in a larger loss of combustible to the ash pit; prevents the firemen from being able to burn as much coal on the grate. Thus the capacity of furnace and boiler is reduced, the boiler efficiency is lowered, more boilers are required for a given duty, spare equipment is reduced and there is a decided lowering of general efficiency and reliability of the power plant.

All operators of power stations will be relieved and the cost of power production will be reduced when coal cleaner and freer from ash can again be obtained. It is reliably estimated that coal now contains on an average about 5 per cent more ash than during a period previous to that of the present high price and recent shortage.

#### HOW COAL BURNS

In Technical Papers Nos. 137 and 135 the United States Bureau of Mines outlines the fundamentals of coal combustion thus:

Combustion of coal is a chemical combination of the combustible ingredients of the coal with the oxygen of the air. The chief combustible ingredients of coal of economic importance are carbon and hydrogen in various combinations. Average commercial coal contains about 82 per cent of carbon and 8 per cent of hydrogen available for combustion. Air, without which the coal could not burn, contains approximately 20 per cent of oxygen and 80 per cent of nitrogen.

When carbon burns completely the product is carbon dioxide ( $\text{CO}_2$ ); when it is partly burned the product is carbon monoxide ( $\text{CO}$ ). If more oxygen is supplied, carbon monoxide can be burned to carbon dioxide. The hydrogen of coal burns to water vapor, which condenses to water when cooled to atmospheric temperature. The furnace gases therefore consist mainly of oxygen ( $\text{O}_2$ ), nitrogen ( $\text{N}_2$ ), carbon dioxide ( $\text{CO}_2$ ), and carbon monoxide ( $\text{CO}$ ). Besides these there may be found near the surface of fuel beds a small quantity of hydrogen ( $\text{H}_2$ ), methane ( $\text{CH}_4$ ), and unsaturated hydrocarbons. By analyzing the gases at successive points in a furnace the progress of combustion can be studied.

In practically all industrial furnaces the combustion of coal takes place in two stages, (1) combustion in the fuel bed, which includes the distillation of volatile matter and partial combustion or gasification of the fixed carbon; and (2) combustion of the gaseous and other combustible rising from the fuel bed in the combustion space.

The processes of combustion in a hand-fired furnace can be best explained by reference to Fig. 4. Here the curves show the percentages of the different gases at various points in the fuel bed and in the combustion space. The changes in the percentage of each gas indicate the process of combustion. The fuel bed is shown to be 6 in. thick. The oxygen ( $\text{O}_2$ ) is all used at about  $3\frac{1}{2}$  in. from the grate. At the same point the carbon dioxide ( $\text{CO}_2$ ) reaches a maximum of about 12 per cent. Beyond this point the percentage of  $\text{CO}_2$  drops and the percentage of carbon monoxide ( $\text{CO}$ ) and other combustible increases rapidly, showing that the  $\text{CO}_2$  is reduced by contact with hot carbon to  $\text{CO}$ . At the surface of the fuel bed the gases contain about 26 per cent of combustible, no oxygen, and about 8 per cent of  $\text{CO}_2$ . Air is added over the fuel bed and the combustible is burned in the combustion space. At the end of 7 ft. of the combustion space, the combustible gases are burned to 4 per cent and at the same time the  $\text{CO}_2$  increases to 14 per cent. With a combustion space long enough the percentage of combustible would be reduced practically to zero.

The three main processes in the fuel bed are the oxidiza-

tion of carbon to  $\text{CO}_2$ , the reduction of  $\text{CO}_2$  to  $\text{CO}$ , and the distillation of volatile matter. The zones where these three processes take place are indicated at the top of Fig. 4. These are called the oxidizing zone, the reducing zone and the distillation zone. The boundaries separating the three zones are not distinct, as the zones merge gradually into one another.

The combustion investigations of the Bureau of Mines are carried on in two parts. One part is the study of the processes of combustion in the fuel bed as affected by the rate of supplying air through the fuel bed, by the character of the fuel as regards structure and composition, by the thickness of fuel bed, by the method of feeding the coal and the air, and by the method of heating the coal. Investigations so far completed show that the fuel bed in most industrial furnaces acts primarily as a gas producer. The gases rising from a level fuel bed contain 15 to 32 per cent of combustible gases, about 8 per cent of carbon dioxide, and practically no free oxygen. This is true even of 6-in. fuel beds and rates of combustion as high as 120 lb. of coal per hour per square foot of grate. The second part of the investigation is the study of the process of combustion of the gases and other combustible rising from the fuel bed in the combustion space, after a sufficient quantity of air has been added.

The process of combustion in the combustion space is influenced by many factors, the most important of which are the following: The volume and shape of the combustion space; the kind of coal used, especially the character, and the amount of the volatile matter it contains; the rate of firing; the quantity of air supplied over the fuel bed; the rate of mixing the air with the combustible rising from the fuel bed; the rate of heating the coal; and the temperature in the combustion space.

The combustion process in the combustion space above and beyond the fuel bed is well illustrated in Fig. 5, reproduced from one of the above-mentioned bulletins, which gives the percentage of the main constituents of the furnace gases at various sections of the long combustion chamber. In connection with this the bulletin states:

The length or the volume of the combustion space required for practically complete combustion seems to depend chiefly on the percentage of excess air, the rate of combustion and the kind of coal. It is mainly these three factors that have been investigated in the series of tests that have been reported in this bulletin.

For given furnace and given fuel there is a percentage of excess air which gives the maximum over-all efficiency of a steam generating apparatus. If the supply of air is increased beyond this percentage the over-all efficiency drops because of the heat lost in heating this excess air. If, on the other hand, the air supply is decreased below this best percentage, heat losses increase on account of incomplete combustion. These are the two principal causes of heat not being available for the boiler, and the ones that are affected by air supply. The percentage of excess air giving the lowest sum of these combined losses varies with the size of the combustion space and the kind of coal. When the combustion space is large, smaller excess air is necessary to obtain a good combustion than when the combustion space is small. With coals having low percentage of volatile matter less excess air is needed for nearly complete combustion than when coals have high percentage of volatile matter.

#### WHAT QUALIFICATIONS MUST THE BOILER-ROOM OPERATORS HAVE?

It is evident from the foregoing that the proper combustion of coal is not simply a process of piling coal in the furnace, and the fireman should possess far more than individual strength sufficient to handle the required tonnage. It is a lamentable fact that our boiler-room forces, particularly during the past two years, have been composed of men picked off the labor market without particular qualifications for the work. The most intelligent man in the power plant should devote the major portion of his time in the boiler room, and the supervision of the fires should be his principal duty.

\*See issue of this paper for Sept. 21, 1918, page 504.

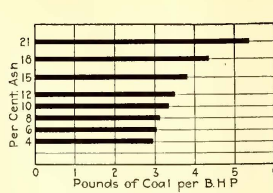
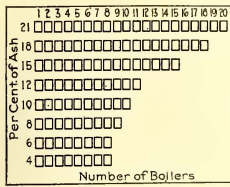


Fig. 3

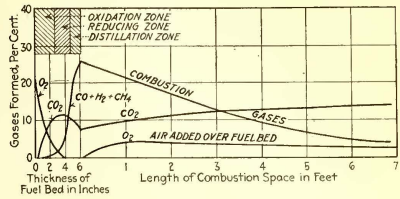


Fig. 4

FIG. 3—GRAPHICAL REPRESENTATION OF EFFECTS OF HIGH ASH CONTENT IN COAL. FIG. 4—PROCESS OF COMBUSTION OF COAL IN HAND-FIRED FURNACE

This is not the rule in most plants. Engineers find the boiler room a hot and unattractive place in which to spend their time, and they have not been encouraged by having sufficient equipment (see Fig. 6) supplied them to permit them properly to measure all the operations in the boiler room. Unfortunately the managements have been satisfied with such practices.

Firemen should understand the theory of combustion in the boiler furnaces as far as possible. Of course there is much that even specialists still have to learn as to the proper relation of furnace shape and volume, stokers and arches, and of the adaptability of all these to the coals of various heat value, physical and chemical characteristics, but a great deal of information is available. Obviously, to burn coal economically necessitates the use of proper equipment and the continuous exercise of good judgment.

**BOILER-ROOM PRACTICE CAN BE IMPROVED IN SEVERAL WAYS**

To return now to the subject of improvements that are possible we realize that we have available for selection in hand-fired furnaces many types of grates, and in mechanically-fired furnaces, many types of stokers. Usually for each locality there are several possible sources of fuel. The first consideration for the plant operator is the selection of fuel adaptable to his plant. One car of coal is not the same as any car of coal because it may contain the same tonnage. One ton of coal is not better than another ton because it is 50 cents cheaper. For the past year or two we have been fortunate to obtain tonnage to keep our plants going,

but the opportunity to buy coal on a competitive basis may return because operators of inferior mines will wish to keep going the "operations" begun under war conditions. Although restrictions on coal supply by the government have been removed, my prediction is that coal will never return to the price level of four years ago, although if the operators do not restrict the output the price should drop somewhat. The law of supply and demand will again assert itself and operators will again see the necessity of furnishing well-prepared, clean coal. The question will be: What coal should a plant use? The answer is: It should be that which will "put the kilowatts on the switchboard" for the least money with careful consideration of all the items of expense involved.

To determine the fuel to use, the necessary evaporation tests on all the coals available should be made. The coals should be analyzed and such physical and chemical tests should be made as will determine the standard to be expected in future shipments. The purchaser should assure himself that the trial shipments are representative of the coal reasonably to be expected from a particular mine.

After good fuel supply comes good furnace handling.

**HEAT LOSSES FROM UNINSULATED HOT SURFACES ROOM TEMPERATURE 70 DEG. FAHR.**

Steam Pressure	Steam Temperature	Waste of Coal in Pounds per Square Foot per Year	Square Foot Surface That Wastes a Ton of Coal a Year
0	212	293	6.8
150	366	840	2.4
200	388	945	2.1
250	406	1,036	1.9

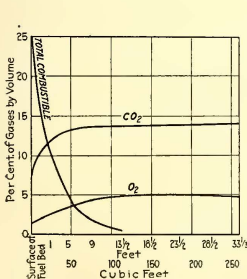
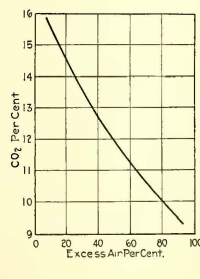


Fig. 5



% $CO_2$  Loss Equipment to Obtain Economy

10	96
16	108
14	122
12	141
10	188
8	208
6	276
5	329

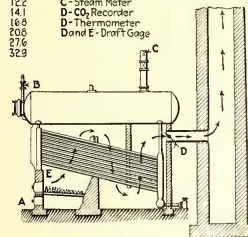


Fig. 6

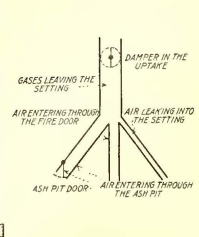


Fig. 7

FIG. 5—CURVES SHOWING PROGRESS OF COMBUSTION BEYOND FUEL BED AND EFFECT OF EXCESS AIR. FIG. 6 —APPARATUS DESIRABLE FOR ECONOMICAL BOILER OPERATION (TABLE SHOWS LOSSES FOR VARIOUS PERCENTAGES OF CARBON DIOXIDE). FIG. 7—DIAGRAM SHOWING WHY DRAFT SHOULD BE CONTROLLED BY FLUE DAMPER.

Hand firing is common in the smaller plants but the labor costs and great difficulty of getting efficient firemen makes stoker-fired furnaces usually more economical where large quantities of coal are handled.

Since the fresh fuel of a hand-fired furnace is placed on top of a hot fuel bed the volatile gases are distilled over the entire fuel bed and there is a demand for additional air to consume these volatile gases that must be supplied through the shutters of the fire door. There is a great variation in the requirement of air over the fuel bed during the processes of firing, hence small quantities of coal should be fired at frequent intervals.

The control of draft on a hand-fired furnace should be by means of a damper, and not by the ash-pit doors. Fig. 7 shows why this is important. If the damper is closed the quantity of air entering under the fuel bed and through the fire door, and leaking through the boiler settings is reduced. If the ash-pit doors are closed to reduce the draft the amount of air entering through the ash pits is reduced, causing the grates to heat and increasing the tendency to produce clinkers, and the air entering through the fire door and leaking through the boiler settings is enormously increased. This excess air through the fire door and setting is seriously detrimental to efficiency because the excess air is not combined with fuel to produce heat but cools the gases in the furnace and boiler settings and carries large quantities of heat up the chimney.

In the stoker-fired plant there are the oxidization, reduction and distillation zones but in a somewhat different relation to one another. Each type of stoker equipment presents a somewhat different problem of air supply, arch construction and operation for efficient utilization of the fuel.

Fig. 8, from Bulletin No. 135 of the Bureau of Mines, shows four typical furnaces and indicates how important it is that the fireman should know the fundamental principles of his particular equipment so that he can operate his fires to the best advantage.

The general rules for efficient furnace operation are these: Always maintain a hot fire. Control the rate of combustion to meet the demand for steam by controlling the air supply to the fire. Give the operating forces sufficient equipment to permit them properly to measure the operations they perform and demand of them an understanding and a continual use of this equipment.

#### FLUE-GAS COMPOSITION MUST BE WATCHED

From what has been said it is evident that the condition of the flue gases gives a good indication of the way in which a boiler is being fired, hence the value of flue-gas analysis. Since combustion in coal is a chemical reaction the analysis of the products of combustion should show in definite degree the efficiency of such operation.

Frequently too much air is permitted to enter the furnaces, filter through the setting and carry away large quantities of heat of combustion. The combustion of one pound of carbon to carbon dioxide requires 11½ lb. of air, and the heat thus produced is 14,540 B.t.u. If 100 per cent excess air should leak into the furnace or combustion chamber the products of combustion would be cooled to about one-half their original temperature. The absorption of heat by the boiler would then be much less efficient and the heat discharged by the stack would be twice as great as if just sufficient air was supplied. The percentage of CO<sub>2</sub> in the stack gases is very nearly a direct measure of the excess air and in

Percentage of CO <sub>2</sub>	Loss in per Cent of Coal Fired
18	9.6
16	10.8
14	12.2
12	14.1
10	16.8
8	20.8
6	27.6
5	32.9

turn a relative measure of the chimney losses. The above table shows the relation of percentage of CO<sub>2</sub> and heat loss for a stack temperature of 500 deg. Fahr.

It will be observed from the table that as the CO<sub>2</sub> reaches very low values the losses due to excess air become very high.

If the air is not supplied in sufficient quantities or is not well mixed there may be carbon monoxide gas formed. The heat produced by burning one pound of coal to carbon monoxide is only 4050 B.t.u., and, therefore, it is important to have complete mixture and adequate combustion space such that all combustible gases will be completely burned. Tests of the flue gases may be made to show the amount of carbon monoxide.

#### BOILER SETTING NEEDS CAREFUL ATTENTION

Properly designed and constructed boiler settings are absolutely essential to efficient operation. The maintaining a high CO<sub>2</sub> percentage in the flue gases is most directly effected by the condition of the boiler settings. Air filters readily through porous brick walls of boiler settings and through the cracks that are often found around side doors, inspection openings and supporting columns. This cools the gases and carries away heat that would otherwise be imparted to the boiler. Walls should, at least, be coated with a heavy-body elastic paint to prevent filtering and all cracks should be carefully stopped to exclude all air.

Baffling in the furnace is also important because it forces the gases to sweep over the tubes and impart heat to the boiler. It is an easy matter for operating men to permit baffling to become bad and to neglect repairs. The chief engineer should regard it as his personal duty to inspect and order needed repairs to baffling, even if he has a competent repair man for this tedious work.

The necessity for insulating boiler settings and steam drums has not been fully appreciated in past practice. Every square foot of heated surface, such as side walls, tops and ends of steam drums, becomes a radiator of heat and the heat radiated is almost directly proportional to the difference of temperature between the hot surface and the air. Modern specifications provide for an inch or more of insulating covering over the entire brick setting and steam drums, applied and maintained as carefully as any steam-pipe covering. Sometimes the entire setting is inclosed in steel casing to prevent infiltration of air. It should be remembered that boiler radiation losses continue at about the same magnitude independent of boiler capacity. If the boiler is working at low rating, these losses are just as great as if boiler was working at full capacity.

#### CLEANLINESS IS A CONSIDERATION ALSO

For the heat of the hot gases to reach the water inside the boiler it must pass through five obstructing layers, namely, a film of gases, a coating of soot and ashes on the outside of the tube, the metal of the tube, a coating of scale on the inside of the tube, and a steam and water film between the scale and the water. Of these two can be removed.



Soot must be removed by blowers and mechanical scrapers, rather than by the use of the hand lance or other crude methods that have proved to be so inefficient in the past. There are few data of any value on the losses due to soot on the outside of tubes, but testimony from those having carefully studied this subject is overwhelmingly in favor of this conclusion. Many of us experience trouble with clinker formation on the tubes, particularly on the rows adjacent to the fires. This may become very troublesome and sometimes the clinker almost stops up the gas passages, necessitating the shutting down of the boilers for cleaning.

Draft-gage measurements over the fire and at the breeching of the boiler are very essential in determining the extent to which the gas passages are being stopped up, as are also temperature readings at the breeching. These indicate the degree to which the tubes are being coated with soot because the gases passing from the boiler become hotter since the boiler cannot absorb the heat. Thus there is great loss of heat to the stack. Soot is an excellent heat insulator.

Next in order comes scale in the tubes. Most all boiler depreciation and maintenance of tubes and drums

not readily be detected when the boiler is in operation. Blow-off valves are a source of considerable waste of heat. In addition steam pipes, feed-water pipes, steam drums, receivers, separators and miscellaneous equipment carrying steam or hot water should be covered to reduce radiation losses. The losses from bare surfaces may amount to very considerable per year, as shown in the following table:

HEAT LOSSES FROM UNINSULATED HOT SURFACES

Temperature of Surrounding Air 70 Degrees Fahrenheit

Steam Pressure, by Gage	Steam Temperature, by Gage	Waste of Coal in Pounds per Square Feet per Year	Number of Feet of Surface Waste a Ton of Coal in 1 Year
0	212	293	6.82
100	338	718	2.79
150	366	840	2.38
200	388	945	2.12
250	406	1,036	1.93

Above figures are based on boiler efficiency of 70 per cent, using coal with an assumed heat value of about 14,000 B.t.u. per pound.

Covering of proper thickness and quality will save from 75 per cent to 90 per cent of the above losses.

All engineers know that there is a substantial saving by heating boiler feed water because such heat as is put into the water before it enters the boiler does not have

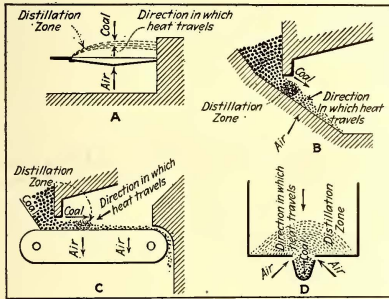


Fig. 8

FIG. 8—FOUR TYPICAL BOILER FURNACES—A, HAND-FIRED; B, OVERFEED, INCLINED GRATE; C, CHAIN GRATE; D, UNDERFEED. FIG. 9—EFFECTS OF SUPERHEAT AND VACUUM ON TURBINE OPERATING ECONOMY

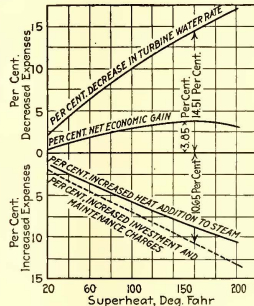
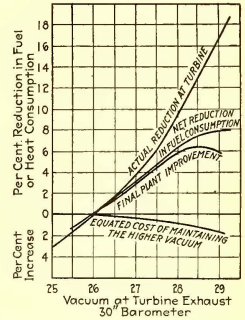


Fig. 9



are due to scale. Tubes are not burned unless they are dirty inside. If water must be treated chemically inside the boiler, it should be done scientifically, but the proper place for treating boiler feed water is outside the boiler. Materials that could cause an encrusting solid should be removed before they are pumped into the boiler. If such a process is carefully carried out it is most economical and successful. The effects of scale are somewhat uncertain but it certainly causes considerable losses.

Certain kinds of soft scale resist the flow of heat very little, whereas scales of other compositions may restrict it seriously. One authority gives us the following as the average loss on account of scale in boilers:

Average Thickness, Inch	Coal Wasted per Ton Fired, Pounds
1/50	100
1/32	140
1/25	180
1/20	200
1/16	220
1/11	300
1/9	320

Operating engineers should be on the lookout for leaks of boilers within the settings, such as those around nipples and tube ends, and in locations where they can-

be supplied by the fuel of the furnace. Many plants can increase the temperature of the boiler feed water by more careful conservation of the exhaust steam from auxiliaries and better maintenance of feed water heaters. In many plants full advantage is not taken of this source of saving. The saving will amount to about one per cent for each eleven degrees added to the boiler feed water.

SOME SAVINGS ARE POSSIBLE OUTSIDE THE BOILER ROOM

So far attention has been given only to the boiler room. There is not usually the chance of saving so much in the engine room. Turbine and engine equipment with reasonable care may operate nearer their maximum efficiency than boiler-room equipment. There are, however, many small sources for improved economy here also. The average engineer spends more of his time in the engine room than the boiler room and knows more about what is required to maintain efficiency there.

Reciprocating engines should be given particular attention to insure tightness of valves and pistons and correctness of valve setting for the conditions under which they must operate. Indicator cards should be

taken at sufficiently frequent intervals. Regular inspections should be made of the valves and pistons to detect conditions that may not be shown by indicator cards.

The performance of turbines and engines is much improved by superheating steam. Where plants are equipped with superheaters an endeavor should be made to keep them in condition to furnish maximum superheat. The gain due to superheat in reciprocating engines comes mainly from reduction in cylinder condensation, while in turbines it results primarily from reduction in windage. In the turbine the steam consumption is improved about 1 per cent for every 6 to 14 Fahrenheit degrees of superheat. Fig. 9 shows these relations.

It is essential also that the most economical vacuum shall be maintained. Poor vacuum, where such occurs, is probably due to failure to keep condenser equipment tight and the air and circulating pumps in good working order.

Turbine economy drops off very rapidly for slight reduction in vacuum. Fig. 9 shows the relation of vacuum and heat reduction for a typical turbine installation. In general there is a decrease of steam consumption of about 5 per cent for each inch of vacuum between 25 and 27 in. vacuum, 6 per cent between 27 and 28 in., and 8 to 12 per cent between 28 to 29 in.

Another fruitful source of loss is through leaky steam traps. Valves and valve seats of steam traps wear and leaks may develop that may not be observed by the chief engineer. Other leaks which may develop are those in packing around valve stems and pipe line joints. These may not appear important, but they are so easily neglected that they are often allowed to continue for a long time. A leak never mends itself and the final cost of repairs is equal to what it would have been at the time the leak developed. Hence, the loss, whatever it is, is a complete one and oftentimes it goes on at an accelerating rate. The following table is suggestive:

LOSS DUE TO STEAM LEAKAGE		
Size of Orifice, Inch	Pounds of Steam Wasted per Month	Total Cost per Year
1/2	300,000	\$840.00
3/8	75,000	204.00
1/8	19,000	53.00
1/16	4,800	13.30

Steam pressure 150 lb; coal at \$3.50 a ton.

Permitting leaks to continue in the plants develops careless maintenance and a careless operating force. One reacts on the other until oftentimes conditions become deplorable. With the present high price of fuel, high cost of labor and keen competition we should all do our very best to reduce our power station loss to a minimum.

# Merchandising of Transportation Is Lacking\*

## Greatest Need of Electric Railway Freight Business Is Active Traffic Organization and Proper Merchandising Methods Based on Public Psychology

By A. B. COLE

Westinghouse Electric & Manufacturing Company

**F**REIGHT transportation, as a commodity to be marketed, must be considered from all angles for electric railways to be most benefited. Usually when speaking of freight, we think immediately of the shipper. Let us analyze, however, a few other important factors that must be considered.

**Law-Making Bodies:** Many lines throughout the country are suffering from unjust restrictions imposed by national, state and municipal authorities. By proper cultivation and some missionary work, these should be made to see that the electric railway performs an economic duty inseparable from the welfare of those served. It seems the paramount duty of all railway operators to be active in chambers of commerce and as many business organizations as possible, so that the business public will find that they are human and that there is a personality behind the business.

**Public at Large:** Make the public think the "electric way," and it will soon realize that electric railway freight is delivered with despatch and often at a more convenient point than by other agency. In other words, advertise service—not rates. Why has the motor truck been able to interest the public so completely? Aggres-

sive and effective publicity surrounded the motor truck with a "veil of romance," and it hitched patriotism and service in the same team, making them almost inseparable. The electric railway needs only to tell and keep on telling its story of service.

**Shippers:** These need to be fully informed of the freight service in all of its ramifications. They should also be told that the service is backed by proper facilities and handled by an experienced traffic man who knows how to sell freight transportation.

**Electric Railway Operators:** In many instances the management thinks of only passenger traffic. Hence in many organizations it will be necessary to arouse interest in "freight service" before any appreciable results may be expected from the people.

**Traffic Bureau:** The sale of freight transportation can be most effectively accomplished through the institution of an aggressive traffic organization supported by effective advertising. Moreover, the traffic developed must be properly handled in order to be held. This is only possible through the co-ordination of all freight-handling facilities in the community and the proper co-operation of all railway managements involved in through-routing. Here the well-paid traffic manager is a valuable investment, for he must not only look after

\*Abstract of paper presented at annual meeting of Central Electric Railway Association, Cleveland, Feb. 28, 1919.

the development of freight business but also see that there is no break in the service. The freight solicitor proper should be used with considerable discretion. Usually, he is of the order-taker type, having only a general knowledge of rates and knowing little of the elements which make the service. In most cases the results of the experienced traffic manager's personal efforts are so singularly superior that solicitors are not needed.

**Service:** The electric railway is in a position to give service superior to that of its competitors, but unfortunately it has failed to tell the public in a convincing way about this service. The electric railway excels in time of transit and in the handling of merchandise or despatch freight. The most profitable or car-load business, however, remains undeveloped to any great extent. Were the handling of bulk freight developed, the revenue derived would greatly increase that now received from the l.c.l. freight, which is the more expensive to handle.

Few lines handle sufficient cars in one train to justify the tonnage at the rate received. Much of the freight handled takes a high-class rate and is delivered in small quantities at the minimum supply. An analysis must be made to determine what classes of freight should be solicited in order to even up the revenue conditions or to eliminate the tremendous amount of freight minimums. All of this must be sold as "service," and when transportation is marketed on its merits, the rate charged will be secondary with the shipper.

**Rates:** In general electric lines have waited for the steam roads to take the initiative in obtaining increased rates. The electric railways have rarely fought for the broad principle of a special rate based upon the superior service rendered. Proper publicity and constructive work by the traffic departments often would persuade the public to pay the higher price that better service deserves. Early morning delivery of overnight shipments and accessibility to stations entitle the electric railway to a differential wherever speed is the essence of the contract. Often electric service is worth 25 per cent more than steam service to the same destination. Some utility commissions and chambers of commerce appreciate these inherent reasons for higher rates, but sales methods are required to market the superior product of freight transportation, build up more business and increase revenue regardless of steam rates.

**Facilities:** In order to secure and handle freight business, confidence must be inspired in the shipper. Proper facilities are necessary. Not only rolling stock, both motive-power and trailing, must be provided, but terminals and station layouts (according to the character of the business to be handled), including passing and industry tracks at way-stations. In many cases it is necessary for the company to assist in locating grain elevators, coal yards, lumber yards, stock yards and loading chutes, and sometimes these can be located on the railway's property with long term leases.

Two paramount results which must be accomplished before an extensive and flexible electric railway freight service can be profitably instituted in the various states, both for inter-state and intra-state traffic, are the standardization of freight rolling stock and the pooling of trailing equipment. The pooling system particularly applies to the handling of inter-line trailers, of which there is a drastic need at present. The Central Electric Railway Association has already done considerable pioneer work along both of these lines.

One of the things which has made possible the extensive development of freight interchange on the steam railways has been the flexible working of the interchange pool, which was operated on the per diem basis before government control. Some particular method will have to be adopted by electric railways in order more extensively to develop interline traffic. There must be no restriction as to destination so long as there is a pair of "electric" rails, reaching to points far and wide. This would be adhering to one of the fundamentals of economical freight operation, which is to keep freight on its original wheels as long as possible.

#### MERCHANDISING IS NEEDED

The lack of merchandising of transportation among electric railways is so evident that authorities in other fields comment on it. Recently *Printers Ink*, an important advertising magazine, printed the following editorial:

What is the matter with the public utilities, especially the electric railways? Many of them seem to have a larger variety of troubles than ordinarily falls to the lot of any one business. They are abused and railed at from every side.

On the one hand, they have lost the confidence and good will of the public, and on the other hand, they have won the suspicion and often the opposition of the state and city officials. From the back, investors are inclined to withhold their support, and in front, the companies are confronted with ever-increasing operating costs. In many cases, rate increases would seem to be a necessity, but because of the bitter feeling that exists toward the utilities it is impossible for them to get permission to advance their charges. The stopping of the war does not hold out any relief to them.

What is wrong? Why should a business that renders the public such a necessary service be so mistrusted? In many cases at least the trouble is that the management of these companies lacks a modern merchandising viewpoint. It may be able to give fair service, but lacking the selling instinct it is unable to sell this service at an adequate price. In any properly advertised business, it is easy to get a just price for the product. When a business customers are sold on its fairness, they are always willing to pay any necessary price advances.

It would appear, therefore, that where a public utility is rendering satisfactory service, better selling methods would overcome many of its problems. In numerous cases, however, the poor service, that the companies are giving is the cause of their troubles. Here again we often find that the actual head of the operating end of the property is not a salesman. Often he has no real authority. The real bosses of the system are the financiers who control it. Frequently, these men have no direct connection with the sales end of the business. They have no knowledge of the physical needs of the property and no conception at all of the service requirements of the public. All they do is to look to the operating head to make the system pay, and, lacking authority to institute necessary changes, he is not able to accomplish anything. Thus the thing goes around in a vicious circle.

What is needed is proper co-ordination between the financial and the operating ends of the business. Then as the active head of the system should be placed a man who in the first place can give adequate service, and after that is able to sell it and to get a compensatory price for it. This is the way our big industrial corporations are successfully managed. It is the way our harassed public utilities should be managed. Until they are thus managed, the cry for public ownership of these systems will keep on rising.

The question naturally arises as to whether freight service should be advertised. It would be wasteful for one line of a system to try to attract business from one of its other lines. But it is wrong not to inform the public generally on the matter of the quickest and the best route to market its goods, and tell whom to see when in trouble and where he is located, etc.

In the education of the farmer by the Bureau of Markets, pointing out to him how best to market his products, the electric railway can do much good by running in

farm publications constructive advertising copy calling attention to its published pamphlets, schedules and general articles describing briefly its facilities. In view of the fact that a large number of the farm papers are more or less localized to certain sections of the country, covering only a few states, it is easily possible to find a medium that will effectively cover a railway's territory. The farmer has a drastic need for an effective marketing system for his products. The electric railway can help through its traffic bureau being definitely informed as to marketing conditions throughout the territory served. Much traffic can be attracted to lines by the freight personnel coming into intimate contact with associations of farmers and other business organizations which have to do with the marketing of products at some city or center. The traffic department can investigate conditions around the important markets and act in an advisory capacity, so that the farmer can feel safe in shipping his products to commission brokers recommended by the railway.

In some cities the steam railroads go so far as to provide a terminal where farm products are shipped to certain commission brokers for daily sale or reconignment to local dealers. This same scheme is possible in the electric railway field. The scheme of the purely farmers' market in many cities has too often proved a failure to require any further comments at this point, other than that attempts to use the electric railway for handling produce to such markets generally have been expensive and in many cases unsatisfactory, unless it was possible to move all goods by carload lot.

Manufacturing industries also present great possibilities for development of electric railway freight traffic. These industries are located many times in centers of distribution so that carload shipments of products can be easily handled by the use of trailers to points on the electric line. This also holds good for large wholesale and distributing companies—for example, such as chain stores. In this case the main warehouse for a chain of stores may be located at some central point where the electric railway can handle all traffic to the various stores in the chain. This presents a continuous flow of traffic which insures the electric railway a profitable return, as most of this freight moves in large quantities and sometimes carloads.

#### COMPETING WITH THE MOTOR TRUCK

With the United States Railroad Administration economizing in its freight service, passing up the way stations and giving adequate attention to only the larger terminals, it behooves electric railways to see that the motor truck does not take advantage of the lack of service performed by the steam railroads to points which are inherently those covered by electric railways. In different parts of the country we now find motor truck lines well established for handling freight as well as passenger traffic. In the rarest cases do we find the motor truck acting as a feeder to electric lines. Generally it is taking the cream of the traffic which belongs to the electric railway.

Unfortunately, the advertising which was used by the Highways Transport Committee under the auspices of the Council of National Defense has done considerable unintentional harm to the electric railway industry in the way of furthering motor transportation. With this constructive literature not only went material explaining to the public in general that it was patriotic to use the motor truck in that this meant "saving a

freight car for Uncle Sam," but there was also instructive literature published which would aid the motor-truck owner to establish freight routes.

Moreover, the establishment of the Return-Loads Bureau was an attempt to stabilize motor-truck transportation. Not only the Council of National Defense, through the Highways Transport Division, did everything to promote this movement, but even the Post Office Department expressed considerable sympathy for it. The perfection of the return-load system was expected to prove a boon to manufacturers of specialties, who, for the very reason that they ship in less-than-car-load lots, have suffered most severely from the traffic jam on the railroads. Through this scheme of return loads, and other things, it has been possible for the motor truck to establish itself in the minds of the shipping public as being a first-class means of handling freight.

From the foregoing it can be readily seen that the motor-truck promoters are wide awake and aggressive. Therefore, it seems high time for united action from the electric railway industry. It is important that the industry be awakened to the fact that it will be necessary to co-ordinate all the available facilities and aggressive methods of conducting business in order to combat the encroaching competition from the motor truck.

Some of the more or less sane motor-truck operators feel that the function of trucks is to act as feeders to existing transportation systems, and especially to the electric railway, owing to its rapid transit. Possibly the ultimate solution of this problem lies in the regulation of the motor truck by the several states and in the use of the electric railway and the motor truck in one or all of three ways:

1. Let the motor truck be used as a direct feeder for l.c.l. freight to the electric railways.
2. Through a system of containers let the motor-truck operators, like forwarding agents at seaboard, collect freight from certain distribution centers to be shipped via the electric railway.
3. Let the motor-truck be used in shuttle service between electric railway systems that require a link for a through freight route.

The foregoing remarks have been made with the intention of pointing out a few fundamentals that will have to be considered in developing freight traffic. Much remains to be said about facilities, but the greatest action necessary is the provision for organizations to develop freight traffic, backed by proper merchandising methods and aggressive salesmanship based on public psychology.

### Electric Railways in China

According to a recent report of the Department of Commerce, only three cities in China have electric railways at present—Shanghai, Tientsin and Hong Kong. Canton is considering the installation of one, and Mukden, in Manchuria, has a horse-car line. The line in Shanghai is the largest and in 1916 had 25.8 miles of track, ninety motor cars, seventy trailers and seven trackless trolleys. The company had a capital stock of \$1,600,000 on which in 1916 it paid 10 per cent. There is a second line in the French concession and a native system in the Chinese city. Most of the development has been in the hands of the British and most of the equipment was made in England.

# Power Plant Economies and Freight Discussed

## by C. E. R. A.

At Cleveland Meeting of Feb. 27 and 28 Papers by G. H. Kelsay and A. B. Cole Brought Out Much Further Information

**A** PARTIAL report of the proceedings of the annual meeting of the Central Electric Railway Association, held at Cleveland on Feb. 27 and 28, was given in last week's issue of this paper. It covered principally the Thursday program. On Thursday evening nearly 270 persons participated in a dinner-dance in the grand ball-room of the Hotel Cleveland. On Friday morning papers were presented by G. H. Kelsay, on "Power House Economies," and A. B. Cole, on "Development of Freight Traffic on Interurban Lines." The papers are abstracted in this issue.

### J. T. BEASLEY SPEAKS AT BANQUET

The only speaker after the dinner on Thursday evening was John T. Beasley, an attorney of Terre Haute, Ind. The program was arranged thus to give the speaker ample time to cover his subject thoroughly and to permit early closing for the dance. Mr. Beasley's central topic was the fundamental essentiality of electric transportation, and its right to existence and protection. There are, he said, no fundamental legal barriers to the raising of rates if failure to raise them would constitute virtual confiscation. There is a reserve power in law and in government which will take care of the exigencies of a situation like that in which the electric railways now find themselves. Relief will be granted them because justice demands it.

Mr. Beasley pointed out, however, that success depends upon adapting equipment to the service which the public demands. We are in a time of change, but not all change represents progress. Real progress is the need of the hour. In view of the future that there is for the electric railway transportation industry there is every reason why managers should "stand by their guns" in its defense. They are trustees for the properties which they operate and they represent the interests of those who have invested funds in the enterprise.

### FRIDAY MORNING DISCUSSION ON POWER PLANT ECONOMIES

A lively discussion followed the presentation of Mr. Kelsay's paper. In answer to a question as to the most economical vacuum to be maintained in a power plant, he said that this depends so much upon local conditions that no general average can be stated. Another question related to the possible advantage of a thin scale in boiler tubes to prevent corrosion. Mr. Kelsay said that such scale is not desirable.

L. P. Creclius, superintendent of power Cleveland Railway, said that, as pointed out in the paper, the keystone to the whole situation is efficient operation of such facilities as are now available. It is quite likely that the price of fuel will remain higher than heretofore, as the two large items of high labor and transportation costs will operate to sustain the price of fuel some 60 to 70 per cent above the former level. As a consequence all attention must now be concentrated

upon the judicious use of this fuel. Several means of doing this have not been generally used, but the time has now come when neglect to practice obvious economies cannot be justified or tolerated.

To the economies listed by Mr. Kelsay Mr. Creclius added the following:

1. In boiler plants the addition of mechanical soot blowers may result in a saving of 5 per cent in fuel when these are properly installed and operated in conjunction with pyrometers whose thermal couples are so placed in the boiler setting as to yield a continuous record of the temperature of the gases escaping to the smoke stack.

2. In plants not already equipped with superheaters a fertile field for economizing exists. A moderate degree of superheat, say 50 deg. Fahr. at the throttle for reciprocating engines and 75 deg. for turbines, may yield a fuel saving of 5 per cent.

3. In general too little attention is given to the extravagant losses from excessive blowing-off of boilers and water columns, and neglect of maintaining control valves in good condition. A good plan is to gather every form of drainage from boilers into a common main which ends in a suitable tank. This should be provided with a recording pyrometer as a check against excessive blow-off intervals and duration, and to indicate leaks. With this arrangement the tank water will always be hot unless all leaks are stopped. Thus the blow-offs can be cut down to the minimum, the limit being set by the feed-water quality. Careful attention along the line indicated, including the stopping of safety-valve blow-offs, can save 5 per cent in fuel.

While the installations suggested may require some additional capital expense, the devices are not very expensive and their use is fully justified by the present high cost of fuel.

M. B. Lambert, Westinghouse Electric and Manufacturing Company, said while power house economies are important, economy in the operation of cars should not be overlooked. Charles L. Henry, Indianapolis & Cincinnati Traction Company, emphasized the necessity for taking advantage of the savings suggested in order to offset the increased cost of getting coal out of the mines. W. E. Rolston, Chicago, Lake Shore & South Bend Railway, said that car and power plant operation are so closely related that they must be considered together. For example, judicious use of trailers during rush hours might have a beneficial effect on the power plant load. Another speaker, referring to plant personnel, urged that positions in the power plant be made attractive to technically trained men. Otherwise the railways will be dependent upon men whose experience has not been sufficiently wide to enable them to secure the economies outlined by Mr. Kelsay. H. H. Norris, ELECTRIC RAILWAY JOURNAL, gave results of a sample calculation to show the importance of practicing economies in the boiler room, where the greatest savings are

possible. He estimated that \$45 per day could be saved in fuel in a 5000-kw. plant, with a load factor of 30 per cent and a coal cost of \$6 per ton. Mr. Crecelius made the point that CO<sub>2</sub> recorders must be used in conjunction with intelligent flue-gas analysis. He also cited a case where in a coal contract provision is made for a price reduction when the ash content exceeds a prescribed amount.

DEVELOPMENT OF FREIGHT TRAFFIC ON INTERURBAN LINES DISCUSSED

F. D. Norviel, Union Traction Company of Indiana, opened the discussion on Mr. Cole's paper by pointing out some of the practical aspects of the situation. The cost of handling freight on electric lines had proved to be much greater than was originally supposed. The same situation was disclosed with respect to the steam roads in connection with their applications for rate revisions. The accounting end of the electric freight business had not received the attention it deserved. Mr. Norviel expressed approval of Mr. Cole's ideas regarding advertising, and said that publicity campaigns should be conducted by groups of electric railways rather than by individual roads. He believes that personal solicitation is even more effective than advertising, but that this should be supplemented by printed matter giving rates, schedules, points reached, etc. If the electric railways would pool their advertising expenditures much better results could be secured.

C. E. Morgan, Michigan Railway, showed the economy of handling freight at night, thus making possible the better use of the railway facilities. Early morning deliveries are greatly appreciated by shippers. Electric lines have now a great opportunity to develop this business on account of the present disinclination of the steam roads to cater to short-haul traffic. Prompt action will solve the problem of motor-truck competition. C. A. Laney, Northern Ohio Traction & Light Company, expressed the belief that the collection and delivery feature must be added to the freight service. He urged that legislation be secured to impose fair road taxes on the motor-truck owners, as it is lack of these that makes it possible for the trucks to take legitimate business from the railways. Mr. Morgan replied that collection and delivery add unwarranted expense to the service and he does not believe their use to be expedient. Bert Weedon, Interstate Public Service Company, made an informal statement for the Indiana committee on motor truck competition to the effect that the committee favors an aggressive advertising campaign. He believes in pick-up and delivery service.

PRESIDENT-ELECT COLLINS TAKES THE CHAIR

After the discussion on freight matters President Coen announced that Secretary-Treasurer Neereamer's report had been printed and that it shows the society to be in flourishing condition. He called for the report of the nominating committee which was approved unanimously and the candidates to office were declared elected. The list of names was printed last week.

In resigning the chair to his successor, Retiring-President Coen thanked especially those who prepared papers for this and previous meetings, and expressed appreciation for the co-operation which he had enjoyed. Mr. Collins, in taking the chair, expressed his desire particularly that the boat ride in July should be a great success. The meeting, which all present considered one of the best ever held, then adjourned.

Italy Prefers Straight to Zone Fares

Application of Extended Zone Plan to One-Man and Other Recent Types of Cars Presents Difficulties

BY FERDINANDO C. CUSANI  
Milan, Italy

I HAVE read with much interest the letter from I. H. Moir, published in your issue for Dec. 21, and I would like to point out some facts relating to the controversy between zone versus straight fares.

While the zone system originated in Europe, it is by no means universal on this side of the Atlantic. Many of the largest street railways in Italy, for instance, have always been operating on a straight-fare basis, while there is a very strong movement toward the abandonment of zone fares in city transit service.

Most of the municipally-owned systems are operated on the basis of straight fares, and many private properties have adopted them, either wholly or in part, especially when they have had to fight municipal competition. And whenever new contracts or franchises are considered, the straight unit fare is always set as an absolute condition for city service, while a return to the



COMMUTATION TICKET USED ON ROME MUNICIPAL TRAMWAY

zone fare is as far from the minds of the regulating bodies as the thought of returning to the horse cars of olden days.

Of course some of the special fare arrangements which seem so greatly to disturb rapid transit executives in the United States are not in use in this country. Transfers, for instance, are never issued so freely, and on some of the bigger systems (in Milan, for instance) they are not issued at all. Strip tickets also are wholly unknown. On the other hand, reduced early morning fares and commutation tickets are an almost universal practice in Italy.

These commutation tickets, which as a rule are issued for one month, three months, six months or one year and carry a perforated photograph of the bearer for identification, are good for any number of rides during the period for which they have been issued, either on one line or on a given number of lines or on the whole system, according to the price paid. On the Rome municipal lines, for instance, a commutation card good for one line and one month costs 6 liri and 20 centesimi (about \$1.16) while a monthly commutation card for the whole system of ten lines costs 15 liri and 60 centesimi.

Italian straight fares average 15 centesimi (3 cents) for regular service and 5 centesimi (1 cent) for early

morning traffic between 6 and 8 or 8:30 o'clock, with a few systems charging 10 centesimi (2 cents) for morning service, 20 centesimi (4 cents) for all-day service and 25 centesimi (5 cents) for owl service. With the exception of the morning fares, which aren't taxed, all other fares include a tax of 5 centesimi (1 cent) per ride levied by the government, which thereby assumes the burden of paying all war bonuses and wage increases to traction employees. When one realizes that many of these straight-fare street railway systems though having had to fight with a metal, materials and supply situation much worse than that which has taken place in America (girder rails for instance, whenever they could be found, up to last November were paid for at the average rate of 25 cents a pound) were actually making money, one cannot but speak highly of the popularity of this scheme over here.

And now, talking about American railways, I should really like to see the happy results of applying the British zone ticket scheme to the latest designs of prepayment cars; let's say, for instance, to the Birneys or the Peter Witts. How could the passengers be checked up without undue complication? Or how could overriding efficiently be prevented without the addition of a very strong inspection force, which would necessarily entail the use of one more man for every few cars? The Mahoning & Shenango Railway seems to have resorted to the system (which seems only practicable on Peter Witt cars) of fare tokens distributed by the motorman when the passenger boards the car. Such a plan might be feasible in cities of such relatively small size as Youngstown, Ohio, but the same plan could hardly be carried out along Broadway or Forty-second Street in New York City, where the traffic and the operation of the car are bound constantly to absorb the attention of the motorman.

And how will the motormen-conductors of Birney cars deal with overriding passengers? Will they have to leave their post, thereby making an emergency stop, whenever a passenger attempts to ride farther than his ticket allows him? Or will they wait to nab him when he tries to get out, thus interfering with the collection of fares from entering passengers? And how will they manage to issue a number of widely different types of tickets, punch them and make change without considerably increasing the length of the stops, thereby absolutely "killing" all the good points and qualities which allow the one-man safety car to be a real relief during rush-hour congestion?

Mr. Moir seems to overlook one more fact; that is, that all of the modern traction equipment in the United States is built for and operated along the prepayment plan. The reason for this seems to have been both the promotion of safety and the assurance that all rides shall be paid for. Most of these cars are equipped with door and step control of some kind, which must be operated by the conductor from a fixed point. All of them, barring the Peter Witts, afford only small ca-

capacity for prepayment while in motion, and the secret of their success lies only in the simplicity of fare-box and straight-fare collection. Would you like to imagine, for instance, a Montreal pay-as-you-enter train loading on a snow-storm day and the conductors fumbling with a series of tickets of the British type, that is to say, all different, small and capable of being punched only with difficulty? What would the prospective car riders think of the scheme, and wouldn't this be a splendid opportunity both for the jitneys and Henry Ford's "tin Lizzies"?

PREFERS PAY-ENTER-PAY-LEAVE PLAN

If I may express my humble opinion on this subject, I would say that the only scheme that seems rather fair and feasible is the two-zone pay-enter-pay-leave plan, as used in some American cities now. This system, though not perfect, seems to be the only method that may rather easily be applied to the thousands of pre-

SOCIETA' DELLE TRAMVIE E FERROVIE ELETTRICHE DI ROMA 042463															042463 SOCIETA' DELLE TRAMVIE E FERROVIE ELETTRICHE DI ROMA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
L. 1															L. 2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
L. 1															L. 2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
<table border="1"> <tr><th>da</th><th>Albano</th><th>Ardea</th><th>Bracciano</th><th>Civita</th><th>Genzano</th><th>Lavagna</th><th>Lido</th><th>M. S. Angelo</th><th>Marcellina</th><th>Marino</th><th>M. Ostia</th><th>P. Lido</th><th>Porto</th><th>Reggio</th><th>T. Ostia</th></tr> <tr><td>Albano</td><td>0.90</td><td>1.70</td><td>2.50</td><td>3.30</td><td>4.10</td><td>4.90</td><td>5.70</td><td>6.50</td><td>7.30</td><td>8.10</td><td>8.90</td><td>9.70</td><td>10.50</td><td>11.30</td><td>12.10</td></tr> <tr><td>Ardea</td><td>1.70</td><td>0.90</td><td>1.70</td><td>2.50</td><td>3.30</td><td>4.10</td><td>4.90</td><td>5.70</td><td>6.50</td><td>7.30</td><td>8.10</td><td>8.90</td><td>9.70</td><td>10.50</td><td>11.30</td></tr> <tr><td>Bracciano</td><td>2.50</td><td>1.70</td><td>0.90</td><td>1.70</td><td>2.50</td><td>3.30</td><td>4.10</td><td>4.90</td><td>5.70</td><td>6.50</td><td>7.30</td><td>8.10</td><td>8.90</td><td>9.70</td><td>10.50</td></tr> <tr><td>Civita</td><td>3.30</td><td>2.50</td><td>1.70</td><td>0.90</td><td>1.70</td><td>2.50</td><td>3.30</td><td>4.10</td><td>4.90</td><td>5.70</td><td>6.50</td><td>7.30</td><td>8.10</td><td>8.90</td><td>9.70</td></tr> <tr><td>Genzano</td><td>4.10</td><td>3.30</td><td>2.50</td><td>1.70</td><td>0.90</td><td>1.70</td><td>2.50</td><td>3.30</td><td>4.10</td><td>4.90</td><td>5.70</td><td>6.50</td><td>7.30</td><td>8.10</td><td>8.90</td></tr> <tr><td>Lavagna</td><td>4.90</td><td>4.10</td><td>3.30</td><td>2.50</td><td>1.70</td><td>0.90</td><td>1.70</td><td>2.50</td><td>3.30</td><td>4.10</td><td>4.90</td><td>5.70</td><td>6.50</td><td>7.30</td><td>8.10</td></tr> <tr><td>Lido</td><td>5.70</td><td>4.90</td><td>4.10</td><td>3.30</td><td>2.50</td><td>1.70</td><td>0.90</td><td>1.70</td><td>2.50</td><td>3.30</td><td>4.10</td><td>4.90</td><td>5.70</td><td>6.50</td><td>7.30</td></tr> <tr><td>M. S. Angelo</td><td>6.50</td><td>5.70</td><td>4.90</td><td>4.10</td><td>3.30</td><td>2.50</td><td>1.70</td><td>0.90</td><td>1.70</td><td>2.50</td><td>3.30</td><td>4.10</td><td>4.90</td><td>5.70</td><td>6.50</td></tr> <tr><td>Marcellina</td><td>7.30</td><td>6.50</td><td>5.70</td><td>4.90</td><td>4.10</td><td>3.30</td><td>2.50</td><td>1.70</td><td>0.90</td><td>1.70</td><td>2.50</td><td>3.30</td><td>4.10</td><td>4.90</td><td>5.70</td></tr> <tr><td>Marino</td><td>8.10</td><td>7.30</td><td>6.50</td><td>5.70</td><td>4.90</td><td>4.10</td><td>3.30</td><td>2.50</td><td>1.70</td><td>0.90</td><td>1.70</td><td>2.50</td><td>3.30</td><td>4.10</td><td>4.90</td></tr> <tr><td>M. Ostia</td><td>8.90</td><td>8.10</td><td>7.30</td><td>6.50</td><td>5.70</td><td>4.90</td><td>4.10</td><td>3.30</td><td>2.50</td><td>1.70</td><td>0.90</td><td>1.70</td><td>2.50</td><td>3.30</td><td>4.10</td></tr> <tr><td>P. Lido</td><td>9.70</td><td>8.90</td><td>8.10</td><td>7.30</td><td>6.50</td><td>5.70</td><td>4.90</td><td>4.10</td><td>3.30</td><td>2.50</td><td>1.70</td><td>0.90</td><td>1.70</td><td>2.50</td><td>3.30</td></tr> <tr><td>Porto</td><td>10.50</td><td>9.70</td><td>8.90</td><td>8.10</td><td>7.30</td><td>6.50</td><td>5.70</td><td>4.90</td><td>4.10</td><td>3.30</td><td>2.50</td><td>1.70</td><td>0.90</td><td>1.70</td><td>2.50</td></tr> <tr><td>Reggio</td><td>11.30</td><td>10.50</td><td>9.70</td><td>8.90</td><td>8.10</td><td>7.30</td><td>6.50</td><td>5.70</td><td>4.90</td><td>4.10</td><td>3.30</td><td>2.50</td><td>1.70</td><td>0.90</td><td>1.70</td></tr> <tr><td>T. Ostia</td><td>12.10</td><td>11.30</td><td>10.50</td><td>9.70</td><td>8.90</td><td>8.10</td><td>7.30</td><td>6.50</td><td>5.70</td><td>4.90</td><td>4.10</td><td>3.30</td><td>2.50</td><td>1.70</td><td>0.90</td></tr> </table>															da	Albano	Ardea	Bracciano	Civita	Genzano	Lavagna	Lido	M. S. Angelo	Marcellina	Marino	M. Ostia	P. Lido	Porto	Reggio	T. Ostia	Albano	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	7.30	8.10	8.90	9.70	10.50	11.30	12.10	Ardea	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	7.30	8.10	8.90	9.70	10.50	11.30	Bracciano	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	7.30	8.10	8.90	9.70	10.50	Civita	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	7.30	8.10	8.90	9.70	Genzano	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	7.30	8.10	8.90	Lavagna	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	7.30	8.10	Lido	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	7.30	M. S. Angelo	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	Marcellina	7.30	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	Marino	8.10	7.30	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	M. Ostia	8.90	8.10	7.30	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	P. Lido	9.70	8.90	8.10	7.30	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	Porto	10.50	9.70	8.90	8.10	7.30	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	Reggio	11.30	10.50	9.70	8.90	8.10	7.30	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	T. Ostia	12.10	11.30	10.50	9.70	8.90	8.10	7.30	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	<table border="1"> <tr><th>da</th><th>Albano</th><th>Ardea</th><th>Bracciano</th><th>Civita</th><th>Genzano</th><th>Lavagna</th><th>Lido</th><th>M. S. Angelo</th><th>Marcellina</th><th>Marino</th><th>M. Ostia</th><th>P. Lido</th><th>Porto</th><th>Reggio</th><th>T. Ostia</th></tr> <tr><td>Albano</td><td>0.15</td><td>0.30</td><td>0.45</td><td>0.60</td><td>0.75</td><td>0.90</td><td>1.05</td><td>1.20</td><td>1.35</td><td>1.50</td><td>1.65</td><td>1.80</td><td>1.95</td><td>2.10</td><td>2.25</td></tr> <tr><td>Ardea</td><td>0.30</td><td>0.15</td><td>0.30</td><td>0.45</td><td>0.60</td><td>0.75</td><td>0.90</td><td>1.05</td><td>1.20</td><td>1.35</td><td>1.50</td><td>1.65</td><td>1.80</td><td>1.95</td><td>2.10</td></tr> <tr><td>Bracciano</td><td>0.45</td><td>0.30</td><td>0.15</td><td>0.30</td><td>0.45</td><td>0.60</td><td>0.75</td><td>0.90</td><td>1.05</td><td>1.20</td><td>1.35</td><td>1.50</td><td>1.65</td><td>1.80</td><td>1.95</td></tr> <tr><td>Civita</td><td>0.60</td><td>0.45</td><td>0.30</td><td>0.15</td><td>0.30</td><td>0.45</td><td>0.60</td><td>0.75</td><td>0.90</td><td>1.05</td><td>1.20</td><td>1.35</td><td>1.50</td><td>1.65</td><td>1.80</td></tr> <tr><td>Genzano</td><td>0.75</td><td>0.60</td><td>0.45</td><td>0.30</td><td>0.15</td><td>0.30</td><td>0.45</td><td>0.60</td><td>0.75</td><td>0.90</td><td>1.05</td><td>1.20</td><td>1.35</td><td>1.50</td><td>1.65</td></tr> <tr><td>Lavagna</td><td>0.90</td><td>0.75</td><td>0.60</td><td>0.45</td><td>0.30</td><td>0.15</td><td>0.30</td><td>0.45</td><td>0.60</td><td>0.75</td><td>0.90</td><td>1.05</td><td>1.20</td><td>1.35</td><td>1.50</td></tr> <tr><td>Lido</td><td>1.05</td><td>0.90</td><td>0.75</td><td>0.60</td><td>0.45</td><td>0.30</td><td>0.15</td><td>0.30</td><td>0.45</td><td>0.60</td><td>0.75</td><td>0.90</td><td>1.05</td><td>1.20</td><td>1.35</td></tr> <tr><td>M. S. Angelo</td><td>1.20</td><td>1.05</td><td>0.90</td><td>0.75</td><td>0.60</td><td>0.45</td><td>0.30</td><td>0.15</td><td>0.30</td><td>0.45</td><td>0.60</td><td>0.75</td><td>0.90</td><td>1.05</td><td>1.20</td></tr> <tr><td>Marcellina</td><td>1.35</td><td>1.20</td><td>1.05</td><td>0.90</td><td>0.75</td><td>0.60</td><td>0.45</td><td>0.30</td><td>0.15</td><td>0.30</td><td>0.45</td><td>0.60</td><td>0.75</td><td>0.90</td><td>1.05</td></tr> <tr><td>Marino</td><td>1.50</td><td>1.35</td><td>1.20</td><td>1.05</td><td>0.90</td><td>0.75</td><td>0.60</td><td>0.45</td><td>0.30</td><td>0.15</td><td>0.30</td><td>0.45</td><td>0.60</td><td>0.75</td><td>0.90</td></tr> <tr><td>M. Ostia</td><td>1.65</td><td>1.50</td><td>1.35</td><td>1.20</td><td>1.05</td><td>0.90</td><td>0.75</td><td>0.60</td><td>0.45</td><td>0.30</td><td>0.15</td><td>0.30</td><td>0.45</td><td>0.60</td><td>0.75</td></tr> <tr><td>P. Lido</td><td>1.80</td><td>1.65</td><td>1.50</td><td>1.35</td><td>1.20</td><td>1.05</td><td>0.90</td><td>0.75</td><td>0.60</td><td>0.45</td><td>0.30</td><td>0.15</td><td>0.30</td><td>0.45</td><td>0.60</td></tr> <tr><td>Porto</td><td>1.95</td><td>1.80</td><td>1.65</td><td>1.50</td><td>1.35</td><td>1.20</td><td>1.05</td><td>0.90</td><td>0.75</td><td>0.60</td><td>0.45</td><td>0.30</td><td>0.15</td><td>0.30</td><td>0.45</td></tr> <tr><td>Reggio</td><td>2.10</td><td>1.95</td><td>1.80</td><td>1.65</td><td>1.50</td><td>1.35</td><td>1.20</td><td>1.05</td><td>0.90</td><td>0.75</td><td>0.60</td><td>0.45</td><td>0.30</td><td>0.15</td><td>0.30</td></tr> <tr><td>T. Ostia</td><td>2.25</td><td>2.10</td><td>1.95</td><td>1.80</td><td>1.65</td><td>1.50</td><td>1.35</td><td>1.20</td><td>1.05</td><td>0.90</td><td>0.75</td><td>0.60</td><td>0.45</td><td>0.30</td><td>0.15</td></tr> </table>															da	Albano	Ardea	Bracciano	Civita	Genzano	Lavagna	Lido	M. S. Angelo	Marcellina	Marino	M. Ostia	P. Lido	Porto	Reggio	T. Ostia	Albano	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25	Ardea	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	Bracciano	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	Civita	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	Genzano	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.65	Lavagna	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	Lido	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	M. S. Angelo	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	Marcellina	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	Marino	1.50	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	M. Ostia	1.65	1.50	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	P. Lido	1.80	1.65	1.50	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	Porto	1.95	1.80	1.65	1.50	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	Reggio	2.10	1.95	1.80	1.65	1.50	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	T. Ostia	2.25	2.10	1.95	1.80	1.65	1.50	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15
da	Albano	Ardea	Bracciano	Civita	Genzano	Lavagna	Lido	M. S. Angelo	Marcellina	Marino	M. Ostia	P. Lido	Porto	Reggio	T. Ostia																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Albano	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	7.30	8.10	8.90	9.70	10.50	11.30	12.10																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Ardea	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	7.30	8.10	8.90	9.70	10.50	11.30																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Bracciano	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	7.30	8.10	8.90	9.70	10.50																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Civita	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	7.30	8.10	8.90	9.70																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Genzano	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	7.30	8.10	8.90																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Lavagna	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	7.30	8.10																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Lido	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50	7.30																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
M. S. Angelo	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70	6.50																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Marcellina	7.30	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90	5.70																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Marino	8.10	7.30	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10	4.90																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
M. Ostia	8.90	8.10	7.30	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30	4.10																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
P. Lido	9.70	8.90	8.10	7.30	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50	3.30																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Porto	10.50	9.70	8.90	8.10	7.30	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70	2.50																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Reggio	11.30	10.50	9.70	8.90	8.10	7.30	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90	1.70																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
T. Ostia	12.10	11.30	10.50	9.70	8.90	8.10	7.30	6.50	5.70	4.90	4.10	3.30	2.50	1.70	0.90																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
da	Albano	Ardea	Bracciano	Civita	Genzano	Lavagna	Lido	M. S. Angelo	Marcellina	Marino	M. Ostia	P. Lido	Porto	Reggio	T. Ostia																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Albano	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Ardea	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Bracciano	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Civita	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Genzano	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.65																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Lavagna	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Lido	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
M. S. Angelo	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Marcellina	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90	1.05																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Marino	1.50	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75	0.90																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
M. Ostia	1.65	1.50	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60	0.75																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
P. Lido	1.80	1.65	1.50	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45	0.60																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Porto	1.95	1.80	1.65	1.50	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30	0.45																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Reggio	2.10	1.95	1.80	1.65	1.50	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15	0.30																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
T. Ostia	2.25	2.10	1.95	1.80	1.65	1.50	1.35	1.20	1.05	0.90	0.75	0.60	0.45	0.30	0.15																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														

DUPLX ZONE INTERURBAN TICKET USED BY ROME ELECTRIC RAILWAY & TRAMWAY COMPANY

payment cars now in operation all over the North American Continent. Such a plan is fair to the public in that it tends to keep the average short ride in the center of the city at the minimum fare while it puts an increased burden on passengers going or coming from the suburbs. It thus encourages the short haul which seems by far the most profitable and makes the long haul fairly and honestly pay for itself.

As for the forms of checks submitted by Mr. Moir, they do not seem to differ at all from the usual British pattern as supplied, for example, by the Auto-Ticket Company, Ltd., of Liverpool or by Whiting & Sons of London, from either of whom anyone interested could probably obtain very interesting catalogs and literature amply dealing with this matter.

Finally, the zone-punch ticket system requires a great deal of checking and accounting, a thing which by no means can be overlooked in the United States, where people seem to be rather busy and accountants, therefore, do not happen to be lying round the streets.

As of possible interest some tickets employed in and about Rome are shown. The largest is a form of duplex ticket, which is used on the interurban line of the Rome Electric Railways & Tramways Company, and is a real terror to the passengers, the conductors and the cashier's accountants. The right-hand side of this ticket is a stub retained in the book issued to the conductor,

and these stubs are checked by the accounting department. The second illustration shows a commuter's ticket used on the Rome Municipal Railway. This card is carried by the commuter in an identification booklet bearing his perforated photograph and his and the manager's signatures. For single fares on the Rome municipal lines, the straight fare is in force, and half of the net earnings go to the employees on a very modern and efficient profit-sharing plan.

I hope that, if perchance Mr. Moir should read this article, he will excuse somebody living much farther than himself from the United States for not sharing his opinions about zones and all their blessings.

### Safety-Car Operation in Seattle

#### Traffic Jumps on Capital Hill Line—Two New Lines Operated with Interpolated One-Man Cars

SAFETY-CAR operation on the Summit Avenue line in Seattle, which began in 1915, has given officials of the Puget Sound Traction, Light & Power Company a good idea of how these cars handle traffic.

The data given in Table I were compiled to show how the safety cars on this line fitted into the traffic schedule, what was the loading time and what percentage of the traffic they carried. The data, which were considered to be typical, were taken between 4 p.m. and 6 p.m. on July 17. The point of observation was on Third Avenue near Pike Street, before the diversion of cars which turn off Pike Street.

The power consumption on one of the Summit Avenue safety cars, equipped with G. E. motors, was 1.51 kw.-hr. per car-mile, averaged over 4626 car-miles. In considering this power consumption it should be noted that there is practically no level track on the Summit Avenue line. The grades are as follows:

2400 ft. of 3.4 per cent grade
1000 ft. of 4.5 per cent grade
600 ft. of 6.8 per cent grade
600 ft. of 6.0 per cent grade
300 ft. of 8.0 per cent grade
Remainder, from 1 per cent to 2.5 per cent

The length of the round-trip route is 4.89 miles. For the most part it runs through a residential and apartment-house district, averaging about nine stops of 6.6 seconds duration for each car-mile. The schedule speed, covering layovers, varies from 7.4 to 6.1 m.p.h.

On Aug. 5, 1918, as noted in the ELECTRIC RAILWAY JOURNAL of Sept. 28, 1918, the company interpolated five one-man cars over the densely settled portion of

TABLE II. OPERATING CONDITIONS ON TWO NEW ONE-MAN CAR LINES IN SEATTLE

1. Kinnear Park Line:		Two-Man Cars	One-Man Cars	Total
Number of cars scheduled		*123	16	139
Per cent of total		88.5	11.5	100
Average scheduled headway		1 Min.	7.5 Min.	52 Sec.
Number of passengers carried		4,936	299	5,235
Per cent of total		94.3	5.7	100
Passengers per car		51	19	47
Length of round trip, one-man cars, 4.2 miles.				
Scheduled speed, including layover time, 6.6 m.p.h.				
Scheduled speed, not including layover time, 7.2 m.p.h.				
One-man cars on Kinnear Line alternate with through two-man cars.				
Headway previous to one-man operation			A. M. M.	P. M.
Headway with one-man operation			7 8	6 3 1/2
			3 1/2	4 1/2
2. Broadway Line:		Two-Man Cars	One-Man Cars	Total
Scheduled speed, including layover time, 6.6 m.p.h.				
One-man cars alternate with through two-man cars.				
Headway previous to one-man operation			A. M. M.	P. M.
Headway with one-man operation			7 7 1/2	4 4
			4 1/2	4 1/2

NOTE—Number of cars scheduled northbound on First Avenue at Pike Street between 4 p.m. and 6 p.m. on week days.  
\* This includes eight different lines.  
† Excluding Alki and Fauntleroy cars—practically empty at this time.

the Capital Hill line. It is interesting to note that about eight weeks after the installation a general traffic check showed that this line had gained 11 per cent in traffic while other lines during the same period showed a gain of only 4 per cent. It is believed that this increase, in large measure, represents passengers who traveled in private automobiles when car service was less frequent. The safety cars added 18 per cent to the car-hour total on the Capital Hill line.

Since the time when the Capital Hill one-man operation was begun, the company has installed one-man service on two additional lines running into the downtown district—the Kinnear Park line and the Broadway line. Data regarding operation on these two lines are given in Table II. Seattle now has four one-man car lines. On the Summit Avenue line operation is by one-man cars entirely, but on the other three lines one-man turn-back service is operated in connection with two-man through cars.

### Unusual Tramway Operation in Russia



Copyright by Committee on Public Information  
TRAMWAY CAR AT ARCHANGEL OPERATED BY AMERICAN SOLDIERS

A STREET car strike in Archangel, North Russia, the headquarters of the American North Russian expeditionary forces, caused the military authorities to press soldiers into service to restore order. A car operated by an American soldier is shown in the accompanying photograph, while in the crowd surrounding the car are two American bluejackets. This is one of the first United States official pictures from the American front in North Russia.

TABLE I—ONE-MAN OPERATION ON SUMMIT AVENUE LINE IN SEATTLE ON JULY 17, 1918

	Two-Man Cars	Summit Line Safety Cars	Total
Number of cars operated	103 <sup>†</sup>	17	120
Per cent of total	86	14	100
Actual average headway (minutes)	1.2	7	1
Headway for thirty minutes at Third Avenue and Pike Street (minutes)	0.9	4.0	0.9
Headway for thirty minutes at Third Avenue and Union Street (minutes—scheduled)			0.75
Number of passengers carried	6,298	649	6,947
Per cent of total	90.6	9.4	100.0
Passengers per car	61	38	58
Loading time per passenger (seconds)	2.61	3.02	
Loading time per car (seconds)	30.7	22.7	
Passengers loaded per car	12.3	7.5	

\* This represents the total number of cars operating on six different lines approximately seventeen on each line.

† A front-end collector was on hand to help with two-man cars, but rendered no assistance to the one-man cars. The apparently excessive loading time of both types of cars was due to the crowded condition of the platforms, which interfered with the boarding passengers.

‡ These last three items were the results of observations covering a portion of the period mentioned (4 p.m. to 6 p.m.) on two successive days.



# Six Hundred Safety Cars in Sixty Cities

**New England Street Railway Club Is Told How Use of Safety Car Is Still Spreading Rapidly — Safety Cars Are Revenue Producers, Expense Cutters and Good Will Gainers**

**S**AFETY cars occupied the center of the stage at a meeting of the New England Street Railway Club in Boston, Mass., on Feb. 27. In introducing J. C. Thirlwall, consulting engineer General Electric Company, as the first speaker, President R. W. Perkins pointed out that the safety car offers the operating man an opportunity to regain the good graces of his patrons—something greatly needed at this time.

Mr. Thirlwall said he could not refrain from recalling a prediction made in October, 1917, that the widespread use of the safety car was slated for early realization. About fifty Birney cars were in operation at that time in six cities, and data as to their service results were relatively few. Today more than 600 such cars are in service in more than sixty cities, ranging in size from towns of 20,000 population to towns of 400,000 like Seattle, and even Brooklyn, where certain lines are operated with safety car units.

A striking feature, Mr. Thirlwall said, is that the use of safety cars has spread rapidly after the initial installations. Thus, from one car at Seattle, three in Bellingham and two in Everett, Wash., thirty are now on order for Seattle, sixty for Tacoma, thirty for Bellingham and fourteen for Everett, with others adopted in Vancouver, Astoria, Aberdeen, and Portland, Ore. The most "historic" installation, that at Fort Worth, has been in service for three years, and all but one of the sizeable cities in Texas are using safety cars. This exception, San Antonio, apparently did not install the service properly, making the mistake of placing the fare box too far away from the motorman and thus slowing down the schedule to a point which aroused popular disfavor.

The safety car is in use in about twenty cities of the Middle West. The East has been slower to take up the idea, but early installations at Plymouth, Mass., and Bangor, Me., are giving good service. Within the last two months large success has been attained in their use at Bridgeport, Conn. Brooklyn and Trenton are also falling into line.

According to Mr. Thirlwall, the success of the safety car now merely depends on the adaptability to a particular installation, the questions being how many lines should be equipped in this way, what lines are best suited to safety-car service and what sort of results may be expected.

## SAVINGS IN POWER AND MAINTENANCE

The reduction in power consumption is practically in proportion to the saving in weight in comparison with the older types of cars. Sixty per cent of the power bill is saved by the 13,000-lb. safety car, compared with the 40,000-lb. two-man car. This means that two safety cars can be run and power cost saved. Where three safety cars are run instead of two of the old type, the power bill is cut in half. Power costs today are terrific. On an exceptionally well-managed road the cost of producing power has risen in the last two years from 0.4 cent to 1.4 cents per kilowatt-hour. Power is to-day

costing the average small road nearer 2 cents per kilowatt-hour than the latter figure named. It is even more important than two years ago to use equipment which will best conserve power.

Regarding maintenance, Mr. Thirlwall said that the first twenty-five or thirty cars have been in service about three years. Some on the Pacific Coast has averaged 60,000 miles per year and have "stood up" as well as older cars in every detail of the equipment, including the safety features. Compared with the ordinary type of four-motor city car, the safety car will require not more than one-half the outlay as to maintenance for equal mileage. Even with a greater number of safety cars on a line the total maintenance cost may run less with these units. It is too early to draw specific conclusions as to the reduction of overhead and roadway maintenance by the use of safety cars.

Turning to the suitability of safety cars for New England, the speaker pointed out that the average wage is today not far from 45 cents per hour for motormen or conductors in that section, or 90 cents per hour per crew. Even by paying the operator of a one-man car 50 cents per hour there is accordingly a saving of 40 cents. Operating costs exceed 40 cents per car-mile in many cases, and receipts on some lines run as low as 15 to 20 cents. On a line earning 15 cents it would be hard to show a profit by the use of safety cars, but these would at least cut down the losses. Lines earning from 25 to 30 cents per car-mile in normal times could about pay their operating costs. By the use of safety cars such lines could probably in many cases be made profitable.

At Fort Worth the net increase in earnings by the use of thirty safety cars was \$78,000 per year, the car-mileage having been increased 20 per cent. To improved service was attributed \$60,000 increased revenue. At El Paso, in February, 1918, safety cars were placed on two lines, and 20 per cent more service was given. The receipts on these lines increased 37½ per cent, those of the other lines being unchanged. The power consumption was decreased 45 per cent, and twelve carmen were required for the lines in question instead of twenty-two. At Tacoma, Wash., thirty-two safety cars on three lines rendered 50 per cent increased service, reduced the platform labor from fifty to forty-two and increased the gross receipts 40 per cent. Ten of the safety cars on a Seattle line are now giving 55 per cent increased mileage and 67 per cent increased receipts, and require twenty-two carmen instead of twenty-nine. At Terre Haute, Ind., the power savings of twenty-two safety cars pay 12 per cent on their cost. At Everett, Wash., eighteen safety cars are being operated daily compared with a former rush-hour total of thirteen of the two-man type. In a four-months' period in 1918 compared with a like portion of 1917, the car-mileage rose 24 per cent and the receipts about 40 per cent. At the same rate per year, the use of these cars (fourteen new cars at \$6,000 each and four remodeled at \$4,000 each) would yield increased revenue

and operating economies sufficient to pay 75 per cent on the total safety car investment, and in a city of stationary population during the two periods under contrast.

Mr. Thirlwall said that with a car equipment maintenance cost of 4.5 cents per car-mile for an ordinary 20-ton car operated by two men, the maintenance cost of a Birney car would be about 1.5 cents; the power costs would be 6.5 and 2.7 cents respectively, and the crew wages, at 8 m.p.h. schedule speed, 11 and 6 cents respectively. Thus, power, maintenance and wages cost, through the substitution of one Birney car for one 20-ton two-man unit, would be reduced from 22 to 10.2 cents per car-mile. An all-day car making 8.5 m.p.h. and running eighteen hours daily would run 56,000 miles per year, with \$12,400 operating cost for a 20-ton car as compared with \$5,700 for a Birney car. If three Birney cars took the place of two two-man units, there would be an estimated saving of about \$3,800 in yearly operating expenses on the basis of each car displaced.

A car earning 80 cents per mile and running eighteen hours per day earns about \$16,800 per year. With Birney cars there should be obtained certainly 50 per cent increased service and 20 per cent more revenue, or \$3,300 additional, making a total net increase of \$7,000 per year per car displaced. On weaker lines, say with earnings of 20 cents per car-mile, the yearly revenue per car would be about \$11,200. Increased service with the safety car should bring \$2,200 more revenue, which, added to the \$3,800 saving in operation, would yield \$6,000 per car. The net increase in revenue and decrease in expenses for three safety cars on a former two-car four-man line would be \$12,000 to \$14,000 per year, and the safety cars would pay for themselves in from eighteen to twenty-four months. On light service lines a car-for-car replacement is generally desirable, but where shorter headways and increased speed would build up traffic better, a 40 to 50 per cent increase in units is good practice.

In closing, Mr. Thirlwall said he doubted the wisdom of buying new safety cars for tripper service, in view of the usefulness of remodeled units in the rush hours and on holidays. About 400 former two-man cars have been changed over so far. Answering inquiries, he said that in some cases it had become necessary to add another turnout where safety cars had been installed, but in others no changes were necessary. Where snow scrapers have been installed, safety cars have made good records even in severe winter weather. Data as to average power consumption, drawn from different roads, were as follows: In the southwest, something under 1 kw.-hr. per car-mile; in the north, in winter, 1.5 kw.-hr., and in summer, 0.9 kw.-hr. The point was brought out that the safety car will start more quickly than an automobile in traversing a railroad crossing at grade.

#### WHY SAFETY CARS SUCCEED

W. G. Kaylor, Westinghouse Traction & Brake Company, New York, N. Y., then read a paper describing how the safety air brake and control equipment work. Continuing he said in part:

So many things contribute to the success of the safety car that it is not only difficult to enumerate them but more difficult to discover them. For instance, increased earnings have been charged to more frequent and faster service and more comfortable riding, but there is another factor that affects the receipts. The collection and registering

of fares is performed in full view of all the passengers. This encourages honesty in the handling of the company's money. Passengers on a safety car are interested in everything that goes on. They watch the operator handle the car and the passengers getting on and off. If there is a delay they know why the car is held up. For that reason they do not kick about the service as they do on a two-man car where they cannot see what is taking place on the rear platform.

The higher schedule speed of the safety car has been charged to more rapid accelerating and braking, fewer stops, the quick opening and closing of the door and a higher free running speed, but there are other contributing factors. For instance, entrance at the front enables the operator to "spot" the car when bringing it to a stop so that no time is lost by the passenger walking half the length of the car to reach the door. This little detail also adds to the comfort of the passenger, particularly if the street is muddy and he is standing on a crossing.

The traffic officers like the safety car. They have no difficulty in seeing when the door is closed and the car ready to start.

There are many reasons why the men like to handle the safety car. There is no drudgery about it. It is simple and easy to operate. The one man is in sole charge of the car. It is his car. He is dividing responsibility with no one. He does not have to wait for the bell but starts when he is ready. He is kept comfortably busy all the time. This causes him to take more interest in his work. It keeps him alert and attentive to his job.

On a large eastern line where safety cars have been in service for about a month an interesting situation has developed. Some of the younger men are complaining that there is too much work to do and they wish they were back on their old cars. Upon investigation it has been found that this was propaganda on the part of the younger men to discourage the older men with seniority rights from bidding for safety-car runs.

When getting ready to start safety-car service it has been found that there is danger of too much importance being attached to newspaper publicity. There is no harm in a small amount of conservative publicity properly handled. If publicity is started too soon, however, there is danger of enthusiasm dying down and speculation arising before the cars are ready for service. The men get together and criticize the car before they know anything about it. On the other hand, if one gives them time to speculate, it is remarkable the number of objections the public can raise and the number of old laws they can discover prohibiting the operation of cars with one man.

A practical demonstration is the best possible publicity. When the cars are all ready and the men instructed—say a few days before the date set for starting safety-car service—invite the newspaper men for a ride around town in one of the new cars. The next day take out the Mayor and other public officials. Then start operation when enthusiasm is at its height. After the second day of operation all objections have faded away, the company is realizing the benefits of more economical operation and the public is pleased with the better service.

The uninitiated electric railway manager still finds it hard to believe all he reads and hears about the success of the safety car. He still clings to the old adage that they may be all right somewhere else but would never do on his line. His patrons would never stand for them. The grab handle is unsuitable, the platform too small, the aisle too narrow, etc. His first objection is that the standard safety car is not the last word in street cars. Maybe not—the inventor would be a greater genius than anyone has given him credit for being if that were the case. But why wait? Why hypothesize? Put them in service and then try to improve on them.

Maj. Gardner F. Wells, consulting engineer, New York City, was then called upon to give some observations upon the safety-car service instituted under his supervision at Bridgeport. Nine cars were put in operation on Feb. 2, 1919, on two of the "thinnest" lines in the city, where no jitney service existed. A five-minute headway was adopted in place of a former ten-minute headway, the length of line being 2.75 miles and the schedule speed 8.5 m.p.h., due principally to cars being held up by large cars and jitneys on Main Street. At the end of the first week's operation a 20 per cent increase in gross earnings was noted on these

lines, the other lines showing a slight decrease. The second week of operation showed 25.3 per cent increase in gross, with a slight decrease on other lines. For the first week the earnings per car mile were 22.5 cents, and for the second week 23.9 cents. In 1918, the Bridgeport division earned 31.62 cents per car-mile and the expenses were 28.47 cents. The Birney cars, which weigh 7 tons compared with 15 to 20 tons for the old equipment, have resulted in a reduction of the operating costs to practically half.

FAVORABLE RECEPTION IN BRIDGEPORT

J. W. Colton, publicity representative the Connecticut Company, described the results of operation in Bridgeport in remarks which follow in part:

Criticism of electric railway operation in Connecticut was most rabid in Bridgeport. This spirit of hostility, however, has almost entirely disappeared in the last two months in Bridgeport. The change of sentiment is due to several things, but much credit is due to the good service given by the safety cars and the feeling that more of these cars will be operated in Bridgeport. Persons who used to walk downtown or depend on automobiles, now go on the trolley car because it accelerates so rapidly and covers the ground so quickly that everybody seems to feel sure he will get to his destination speedily and conveniently. We have not yet heard a single complaint regarding the operation.

Thus far the safety cars in use have tended to create that which all electric railways most need—public good will. We are confident that when we have tried them out in Hartford and New Haven, where they will begin operating next week, the public will demand more of them. Safety cars are the best eliminators of criticism we have found, because the public is prone to complain more about slowness of service, long waits for cars and so-called minor deficiencies than about the big things that bother the railway men themselves. Anything that will create good will is extremely valuable to the railways at this time, and I would put the safety car at the top of the list of the good-will producers.

As far as preparing the public for safety-car operation is concerned, we gave car riders about a month's notice of the coming improvement. The cars were thoroughly described by means of news articles. When the operators were being trained, the newspapers were given items as to the progress. Three days before the cars went into actual service, advertisements were printed in all the papers to announce the new service, the advertising continuing through the Sunday on which the new service began. Several days before the service began, placards were put in the car windows on the two lines concerned and an additional sign, "Please Have Exact Change Ready for Your Fare," was placed in the cars. The new cars were run over the route without any passengers but, on regular schedule on the day before their use. Consequently, everybody on the streets saw the cars, and everybody who read the newspapers knew the cars were to be operated. The result was that they began operation under the most favorable circumstances, all prejudice against them having been removed in advance.

Major Wells then read extracts from many letters from representatives of city governments as to their opinion of the success of the safety car in their communities. At Austin, Tex., "these cars are popular, enabling the railway to secure substantial savings in operation without impairing the service." El Paso, Tex., cites the "quick starting and easy stopping, and undivided responsibility secured by this greatest improvement in street car service for several years." Houston, Tex., reports the cars a success if not overcrowded.

Tampa, Fla., says that the people are on the whole pleased with safety cars, commends the safety devices and objects only to a few jerky starts and stops due apparently to careless handling. Kansas City, Mo., has safety cars on eleven lines; twenty-nine cars have been converted to "safeties," and twenty-five new

safety cars will soon be put on the system. Fort Worth reports a success in every way from the public point of view, the cars being "fast, quick in acceleration like a racing automobile." Tacoma, Wash., and Waco, Tex., cite the improvement in service, with noteworthy savings in operating expenses. At Bridgeport cases have arisen where automobile owners admit putting up their autos and patronizing the safety cars instead, and the service of this new rolling stock is giving the jitneys a hard run for their money.

Major Wells also presented the following notes and figures on the safety-car practice of some companies under Stone & Webster management:

While quite a number of Stone & Webster companies are operating safety cars, there are only two operating practically all one-man cars, at Bellingham and Everett, Wash. At Bellingham the equipment at present consists of twenty safety cars purchased new, eight safety cars built by the company, and eight two-man cars. The two-man cars are not all in use, however, an average of two being operated at the present time. The eight safety cars built by the company are similar to the Birney type, the only important difference being that the trucks are somewhat heavier than those ordinarily used. All but one of this company's lines are operated with safety cars, this line representing not much more than 10 per cent of the total operation.

The Everett company operates fourteen lightweight safety cars, seven rebuilt one-man cars and two two-man cars. The seven rebuilt cars are considerably heavier than the ordinary safety car, having been made over from single-truck closed cars originally operated with two men. All but one line of this company are operated with one-man cars, this line representing about 7 per cent of the total operation.

In both cities interurban cars operate within the city limits over tracks of the local company, but the expense of operating these cars is not included in the figures given in the accompanying table except so far as maintenance of track and overhead would be affected by this operation.

The power expenses per kilowatt-hour, it will be noted, are somewhat higher for Everett than for Bellingham. This is due to the fact that the former purchases practically all of its energy, while Bellingham generates more than half of its energy by water-power and purchases almost all of the remainder at a low rate.

As far as the question of depreciation is concerned, no definite data are had at the present time, but it is assumed in various estimates that one can count on a life of about fifteen years for safety cars. These cars cost about \$6,000, which works out on the straight line basis to \$400 per year depreciation. On an assumed yearly mileage per car owned of 40,000, this gives 1 cent per car mile. Interest at 8 per cent would give an amount of 1.2 cent per car mile additional.

DATA ON BELLINGHAM AND EVERETT SAFETY CAR SERVICE

Way and structures	Cents per Car-Mile 1918	
	Bellingham	Everett
Equipment*	1.44	1.82
Power	1.20	1.03
Conducting transportation	0.85	1.33
Traffic	6.81	6.84
General and miscellaneous	0.61	0.20
	3.02	3.72
Total expense	13.10	14.99

\*Not including I. C. C. depreciation charge.

A brief discussion followed the presentation of the foregoing data. It was pointed out by C. C. Pierce, General Electric Company, Boston, that the traffic load-factor is improved by safety cars installed on a higher ratio than 1 to 1. Merchandising transportation through increased service is the great need of the day. It was stated that 26-in. wheels are used in New England safety car practice, and this helps to maintain service under snowy conditions. It was also said that within three months about twenty-five safety cars will be in service on the Philadelphia Rapid Transit System.

# Beating the Strikers at Kansas City

Third Strike in Sixteen Months Caused Replacement of Practically the Entire Organization—Domination of Outside Labor Agitators Completely Broken

**M**ANY items concerning the recent strike of employees of the Kansas City (Mo.) Railways have been appearing in *ELECTRIC RAILWAY JOURNAL*. Because of the unique situation, however, a review with additional information concerning certain developments should be of interest to all electric railway operators.

On Aug. 16, 1917, after a strike lasting eight days, the Kansas City Railways recognized the Amalgamated Association of Street & Electric Railway Employees and entered into a contract for one year. In March, 1918, the men went on a sympathetic strike with the laundry workers' unions for five days. Some employees who had never joined the Amalgamated and others who placed their loyalty to the company above unionism refused to strike. These men banded together and in April, 1918, formed the Kansas City Railways Employees' Brotherhood.

## PURPOSE OF LOCAL BROTHERHOOD

The constitution of this brotherhood states that the employees are able to manage and take care of their own affairs and to look after their own interests without interference, advice or dictation by any individual or foreign organization, and that their employment is of a quasi-public nature which is too necessary for the public welfare to be interrupted by strikes of any nature whatsoever.

Active membership in this organization is limited to the following classes:

1. White employees permanently employed. Office employees, officials or those acting in a supervisory capacity shall not be eligible for membership except as honorary members.
2. Persons who do not belong to any other labor organization and who voluntarily express themselves in entire agreement with the principles of the brotherhood without any mental reservations. Applications for membership must be indorsed by the membership committee, and the members must be elected at a regular meeting by a majority of those present and voting.
3. The privileges of honorary membership may be extended to any officials and employees who subscribe to the constitution and whose applications are indorsed and voted upon in the same manner. Such honorary members have no vote and may only be heard by previous invitation or by majority consent.

The association is unalterably pledged to the principle that it is not to affiliate with or become a member of any other labor organization. Members joining any other labor organization forfeit their membership. The affairs of the association in its dealings with the Kansas City Railways are to be conducted wholly through its own officers or committees without aid, advice or interference from persons who are not members. The association is committed to the settlement of all difficulties with the company by conciliation and friendly arbitration.

Members of the brotherhood grew in number to 500 for all departments. They held sick and accident in-

surance paying \$15 a week and paid a total of \$1.75 a month dues. Meetings were held every two weeks in a local hall.

## HOW THE WAGE QUESTION AROSE

When the time came for the renewal of the contract with the Amalgamated Association, Aug. 17, 1918, the company voluntarily offered an increase in wages of 5 cents an hour, amounting to \$560,000 out of the \$1,000,000 expected to result from the increase in fares from 5 cents to 6 cents. The increase placed the scale at 30 to 38 cents. The employees refused to accept the offer, and the matter went to the National War Labor Board subject to the famous articles of submission in part as follows:

It is agreed by and between Division No. 764 of the Amalgamated Association of Street and Electric Railway Employees of America and the Kansas City Railways that the matter of wages and schedules shall be placed before the National War Labor Board for adjustment, subject to the general financial condition of said company and its financial ability under present revenues or any future increases allowed, pursuant to action or recommendation of the War Labor Board or otherwise to pay any wage increase which may be granted.

The decision of the War Labor Board shall be in force for one year from the expiration of the present contract, Aug. 17, 1918, to Aug. 17, 1919, and under the conditions herein set forth to be valid and binding upon the Kansas City Railways and the said association and all the members thereof.

This agreement, made on Aug. 17, 1918, was signed for the company by P. J. Kealy, president, and for the Amalgamated Association, Division No. 764, by E. F. Machael, president, and Sam Wallace, Allan Nelson, J. S. Smithey and W. H. Miles, wage committee.

The War Labor Board on Oct. 24 granted an increase to from 43 cents to 48 cents. In handing down the decision, however, the board noted its conditional aspect in the following words:

Under the agreement of submission between the company and its employees, this award is made conditional upon the granting of an increase in the rate of fare to be charged per passenger by the company and subject to the financial ability of the company to meet the requirements of the award.

The wage increase amounted to \$1,300,000 a year over the increase offered by the company and, if paid without a further increase in fares, would have resulted in a deficit of \$1,600,000.

Immediately the railway filed a petition in the Federal Court asking an injunction to restrain the States of Kansas and Missouri, the two Kansas Cities and the two Public Utility Commissions from interfering with the collection of an 8-cent fare which the company declared necessary to pay the award of the board. The company also asked for a construction of the award of the board. On Dec. 3 the court denied the injunction, declaring that the award of the board was not mandatory.

The company then appealed to the United States Supreme Court and to the Public Utility Commissions of Kansas and Missouri. The appeal to the Supreme Court, it is said, was dismissed at the suggestion of the employees, and the Missouri commission refused to take action because its jurisdiction was then in question. During this period an intensive advertising campaign to gain public support for the 8-cent fare and to secure higher wages for the employees was being simultaneously carried on.

**OUTSIDE AGITATORS STIR UP TROUBLE**

About this time some outside labor leaders appeared on the scene and befogged the issue by making the employees believe that the award of the board was unconditional. A union committee met with President

Kealy on Dec. 9 and discussed the action to date. President Kealy told the committee that the company could not pay the increase in wages until an increase in fare was obtained, and it was decided the committee should call on the Mayor to seek city support for an increased fare. Instead of doing this the employees belonging to the Amalgamated Association met on the night of Dec. 10 and voted to strike at 4 o'clock the next morning. No notice from the association was given to the company.

Through some loyal employees the company was at once notified of the action. A large half-page advertisement, entitled "A Strike Against the Community," was inserted in the morning papers. This advertisement featured the special strike clause included in the contract which the company had with the Amalgamated Association, as follows:

In consideration of this agreement the members of the association hereby agree that they recognize that it is their duty to the public to furnish continuous and uninterrupted service, and to this end they shall under no circumstances cause any interruption of this service, and that there shall be no strikes, lockouts or concerted cessation of work for any cause during the entire term of this contract, and should any question arise that cannot be amicably settled, it will be arbitrated as provided in Section 1.

President Kealy wired W. D. Mahon, president of the Amalgamated Association, that the men had broken their contract and demanded that the contract be lived up to.

**STRIKE FAILED AFTER TWO DAYS**

Approximately 1800 men walked out on the morning of Dec. 11, leaving the entire system paralyzed. The power house remained shut down for about twelve hours, and then some of the employees belonging to the Employees' Brotherhood resumed partial service. The Mayor, the police commissioner, the city member of the Board of Control, the Employers' Association and other public organizations took a firm stand and offered assistance to the company. Representatives from the Department of Labor were denied a conference with the Mayor, who said that as the men did not consult him when they struck in the night they need not consult him when they were looking for a "sled to ride out on."

The cars remained in the carhouses until Dec. 13, when at 7 a.m. the Brotherhood men began the operation of sixty-nine cars and continued this operation between the hours of 7 a.m. and 5.30 p.m. until Dec. 28, gradually increasing the number of cars as new men were accepted for employment and trained. Two policemen were assigned to each car and police patrolled the division points, as considerable disorder accompanied the beginning of service.

From the beginning the company had about 400 applications a day, having wired advertisements to newspapers in St. Louis, Chicago, Denver, Omaha, Des Moines and other cities in the Middle West. Strike breakers were not imported and no business was done with any strike-breaking organizations, it being felt that the class of men so furnished were generally not desirable. Any men who came in from outside sources were put through the regular employment routine and given permanent employment. About 600 soldiers and sailors were employed.

At the beginning a bonus of \$5 a day for the transportation department was paid over and above the regular wages. The bonus for the power-house, track, and shop employees was \$2 a day, it being assumed

**THE WORDS BEHIND THE DYNAMITE**

**Labor Temple Speeches in the Afternoon DYNAMITE OUTRAGES THAT NIGHT**

**THE CAUSE**

The following are extracts from speeches made from the platform at Labor Temple each afternoon to the men who left the service of this company.

"We've got to get busy and let the world know there's a strike on here."

"You all know the news in morning and in every alley you pass you see these little bracks, each one saying, 'Why don't you take me?'"

"I still believe this strike will be won in the field, not in the Labor Temple. From the noise of the pelican car whistles and the reports of accidents in the morning papers, some one is waking up."

"It is a good thing to have an alibi."

"I want to urge you to stick, and above all things, go out tonight and some way, somehow, keep the people off the cars. You know the Vandy did not win the war by sitting in the trenches, so my last word is to get busy."

"Go home and go straight to bed because if you stay up you might do something that would cause these people to stay off the cars and you ought not to do that because it might win your strike for you."

"Well, get busy when you wake here."

"Several men were arrested last night, but they kept their mouths shut and got out this morning. I want you to keep up your good work. This case can't be in Washington any more than the Vandy whipped the Kaiser. They didn't whip him in Washington. From now on these meetings will start at 1 and will not last as long, as I want you to go out and get busy."

"Keep the good work going on, but always have an alibi where you are."

"Now in case you don't see us here for a little while in the future, don't think we have forgotten you. We have a revolution on hand—don't care to tell what, but in case you see some of us some time in some place we don't belong, don't recognize us, but just—forget me? Now when you get out of here go home and go straight to bed. If you do not you might throw an alibi-appeal through a car."

"I always said that a man's hand was given him to make a living first and to get near his job next. I want to see a lot of words with handgrips around their jaw, in their future."

"I wired back to O'Shea all O. K.—that we had had more action here in the last 24 hours than was taken in the last two weeks."

The company asks the assistance of every law-abiding citizen of Kansas City in its efforts to apprehend these criminals. We ask every man to be on the alert. IF SUSPICIOUS CHARACTERS ARE SEEN AT NIGHT ON OUR TRACKS, TELEPHONE THE POLICE and if possible, with the assistance of neighbors capture the outlaws on the spot. The possession of explosives is a crime and the government will prosecute to the extent of its power. YOUR WIFE OR SISTER MAY BE A VICTIM—DON'T WAIT FOR THE POLICE BUT TAKE THE LAW INTO YOUR OWN HANDS WITH ALL FORCE NECESSARY.

A REWARD OF ONE THOUSAND DOLLARS will be paid for any information which will lead to the arrest and conviction of any person placing explosives in, near or upon the property of this company. The name of the informant will be kept in confidence.

THE KANSAS CITY RAILWAYS COMPANY

January 17, 1919.

Philip J. Kealy, President.

**THE EFFECT**

The nights following the meetings in which these speeches were made, murders were committed from their homes to waiting automobiles. They carry with them bombs made of brass tubing, filled with dynamite with explosive caps at one end. These are placed in drawers or attached to the

It makes no difference to them that the approaching car may be filled with helpless women and children—that they may be injured or killed, the innocent victims of Bolshevik lawlessness.

They care nothing for human life as long as they are able to carry out their anarchistic attacks against the law-abiding citizens of Kansas City.

Bombs have been thrown against car barns, in one case injuring four office employees.

Men have been shot at on the cars.

Bricks have been hurled through car windows.

These cowardly assassins take no chances of coming out in the open. Their crimes are not committed in the hot heat of anger, but are carefully and maliciously planned in cold blood.

These crimes are not isolated cases. They are not the work of individuals, but are the result of a carefully laid, well planned and well financed conspiracy against the property of the company and the lives of its employees and the passengers upon its cars.

"These men are plentifully supplied with dynamite and the bombs are made by men who understand the use of explosives."

They are supplied with automobiles to carry them to the points of operation and assure a safe escape.

No sane man for a second will say that there is not a direct connection between the speeches made at Labor Temple and the preparation of the men dangerously known to the courts—the placing of explosives to endanger the lives of innocent persons.

There have been over forty instances of these attempts made since the 21st of December.

that the platform men were placed in more dangerous positions. The shops did not begin active work until a week after the beginning of the strike, owing to the fact that all available shop and even office employees were drafted into platform and instruction work.

On Dec. 16 the company notified the men that if they did not return to work at once they would lose their seniority rights. Forty or fifty came back, tore up their union cards and threw away their buttons, although the company announced that no discrimination would be made against any man because of any union affiliation.

There was little violence during the early part of the strike because the Federal Court issued an injunction restraining the strikers and their leaders from interfering with the operation of the cars and prohibiting picketing and loitering about the property of the company. Moreover, the Seventh Regiment of the Missouri National Guard was placed on duty patrolling the lines with motor cars containing four men each with fixed bayonets.

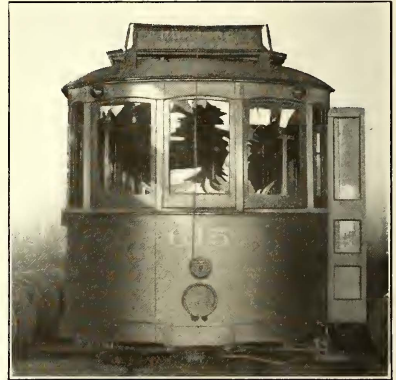
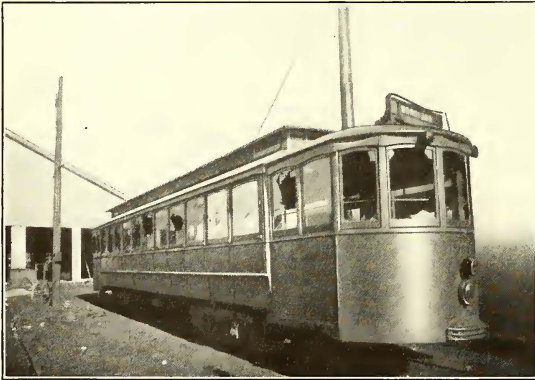
On Dec. 18 a committee including the Mayor, the city counselor, two representatives of the Amalgamated

miting, were arrested by the government and confessed, dynamite being found, it is said, in the division headquarters of the local Amalgamated Association. Five other arrests for dynamiting were made later, all the men pleading guilty.

The average number of cars injured so seriously by collision as to be useless until repaired was for some time about two a day, although as many as eleven cars were turned in in one day.

Early in January another conference was held at which the company informed the strikers that employees could belong to any union they desired without discrimination being shown by the company, and that the company would agree not to hire additional women conductors, but that it would never sign another contract with any union and would not permit the wearing of union buttons.

The strikers then appealed to the War Labor Board to reopen the case, asserting that the company had not been diligent in an effort to increase fares. The city counselor and the Mayor appealed to the board not to reopen the case, but it assumed jurisdiction and set Jan.



TYPICAL APPEARANCE OF KANSAS CITY CARS AFTER DYNAMITING

Association, two of the Brotherhood, President Kealy, the president of the local Chamber of Commerce, the president of the Employers' Association, the representative of the National Department of Labor and one public-spirited citizen met and unanimously adopted the following resolution, which the company has followed:

That the company take back all old employees with clean records whose places have not been filled and that preference in immediate employment be given all old men with clean records whose places have not been filled.

Late in December the strikers realized that they were losing out as the Mayor, all commercial and public bodies and President Kealy refused any further attempts at arbitration. The company continued to hire men at the rate of more than 100 a day, and car service was gradually increased. Then dynamiting began outside company offices and carhouses.

Many cars were dynamited, causing much damage to equipment and buildings and injuring many persons. In Kansas City, Kan., platform men were sworn in as deputy sheriffs. Some strikers were shot. The outrages continued until four strikers, leaders in the dynamiting,

were arrested by the government and confessed, dynamite being found, it is said, in the division headquarters of the local Amalgamated Association. Five other arrests for dynamiting were made later, all the men pleading guilty.

The average number of cars injured so seriously by collision as to be useless until repaired was for some time about two a day, although as many as eleven cars were turned in in one day.

Early in January another conference was held at which the company informed the strikers that employees could belong to any union they desired without discrimination being shown by the company, and that the company would agree not to hire additional women conductors, but that it would never sign another contract with any union and would not permit the wearing of union buttons.

The strikers then appealed to the War Labor Board to reopen the case, asserting that the company had not been diligent in an effort to increase fares. The city counselor and the Mayor appealed to the board not to reopen the case, but it assumed jurisdiction and set Jan.

# Distribution of Materials and Supplies

**Great Opportunities for Economy Lie in Improved Methods of Distribution and Proper Use of the Storeroom — If a Reduction in Total Stock Required Can Be Effected, It Means an Unnecessary Investment Saved**

By B. J. YUNGLUTH

General Storekeeper for Receivers, Pittsburgh Railways

**W**HILE the war was in progress it was imperative to anticipate long in advance the materials required for maintenance and operation. Because deliveries were so uncertain, it was necessary to carry much larger stocks of all standard materials and supplies, with the result that, disregarding the increased prices of materials, investments in materials and supplies increased probably 50 per cent. If to this is added an increase of approximately 75 per cent in the cost of materials, the amount of money tied up, as compared with the pre-war period, increased approximately 125 per cent. While prices will probably recede slowly, manufacturing conditions should soon be such that it will be unnecessary to look so far in advance. Prompt deliveries being obtainable, stock balances ought to be considerably decreased. It is time to trim sails.

## SUPPLY SUFFICIENT FOR REQUIREMENTS

Even now, when the financial condition of some, or I might say all, companies is a matter of grave concern, the managements are undoubtedly prepared to supply for maintenance and operation the materials and supplies that are necessary. But can you blame them if they are unwilling to provide more than will suffice? It should be borne in mind that prices now are abnormally high and apparently on the decline, and each day, week, or month that the purchase of additional supplies is deferred will probably mean that less need be paid. May we not assume, then, that the problem is so to distribute what is on hand or must be purchased, that none of the many different groups of men working at shops, track repairs, stations, offices, etc., may be inconvenienced by lack of any material? This means that we must be particularly careful that no one group of men has more than is necessary for immediate requirements, for if the total available supply is sufficient to meet the requirements of the property as a whole, an over-supply at some points would mean privation at others.

## LEARN FROM WAR REGULATIONS

Everyone is familiar with the activities of the food, fuel and railroad administrations set up by the government shortly after the United States entered the war for the purpose of properly distributing, during that abnormal time, the amount of food, fuel and transportation available, so that each industry and each individual might secure what was really necessary but no more. Perhaps most of us will remember the activities best by the recollection of the regulation of the supply of sugar. Now that it is all over and the inconvenience somewhat removed, I think we will agree that each of us received all the sugar that was necessary, even

though it came to us in small packages quite frequently, instead of in large quantities every once in a while. During that period hoarding, as will be remembered, was discouraged, because had there been any hoarding many of us would have been without a supply a great part of the time. Perhaps we can learn from these experiences many things that, in so far as they affect materials and supplies, can be adapted to electric railway operation.

All men like to be surrounded by as much material of the kind they are using as they can get hold of, and while it is in demand it occupies a place uppermost in their minds, but as soon as they have no further need, it ceases to engage their attention. Consequently they seldom think to send the surplus back to the distributing point so that someone else may be benefited. When there is talk on a railway property about economic shortage of materials and complaint that work is held up in consequence, it will rarely be found that the company is unwilling or unable to remedy an actual scarcity of material. Instead, it will usually be found that the system of distribution is at fault.

## TENDENCY OF FOREMAN TO ACCUMULATE MATERIAL

The distribution of material on a railway is based upon requisitions made by the foreman in charge of the activities at each of the hundreds of points on the property. If each of the foremen has no guide but his desires and no specific instructions, no constant supervision on the ground or no scrutiny of his requests for replenishing his supplies, it will be found in nine cases out of ten that he has more material than is absolutely required.

It is not uncommon to encounter the fellow who feels that all of the material of the kind that he uses, even though he is the only person who employs it, should be piled up at the end of his bench or somewhere in his particular department, and he therefore draws from the storehouse all that is available. The next time he needs some, he is surprised to find that, since there is no apparent demand, the storekeeper is unprepared to supply him. The storehouse records must reflect the demand for material not in a spasmodic way but from day to day so that a supply to replenish the stock may be ordered at the proper time.

Aside from material of such a nature that it must be held in stock for infrequent uses or for possible breakdowns, it would be uneconomical to stock quantities of material for which there is no continual demand. On account of rapid changes in types of equipment and adoption of improved practices, one must always be watchful of items that are gradually becoming obsolete, so that when a change is made there may be a minimum stock and no unnecessary loss.

Before a foreman can make an intelligent requisition he must know the probable volume to be used, the quantities he has on hand and those that are still due him on previous requests. Such information should be shown for each item on the requisition. To assist him it is necessary to establish some sort of schedule so that he will know on what dates requisitions should be prepared and on what dates delivery will be made, with the additional privilege, in case of necessity, of procuring special deliveries without too much formality. Given this information, he should be held to strict accountability for the stock of material he has on hand, and this can only be done by frequent inspection right on the ground.

#### APPROVAL OF REQUISITIONS OFTEN PERFUNCTORY

It is probably true in the majority of cases that persons having the duty of approving requisitions, because they come in an unceasing stream, delegate such work to subordinates who frequently do not have sufficient knowledge to pass upon the requests so that, in the absence of occasional checks, the approval becomes altogether perfunctory. I have known men engaged to pass on requisitions who have thought it their duty to reduce practically all items requested by 50 per cent, thinking that was the way to regulate the amount of material furnished, forgetting that their job was not to cut down the amount of material but to furnish what was required and not a whole lot more. An occasional intelligent question asked by the approving officer of the requisitioner makes him careful to exercise much more judgment in preparing requisitions.

Usually when quantities of material are allowed to accumulate where work is in progress, the place gets in a rather untidy condition with the result that when a piece is needed it is easier to go to the storehouse for it than to locate it in a pit or elsewhere.

The shops which the writer has visited having the best reputation as producers were conspicuously the ones that had the decks cleared for action like a battleship. It is vitally necessary that from each of these points all materials in excess of those required for current use should be returned to one point, the storehouse, which acts as a reservoir to keep the supply lines filled.

It may be acknowledged that men do the best they know how, and if not told to the contrary, they will assume that the way they follow is the best way known by their superiors. The whole condition is one demanding enlightenment.

#### WORN-OUT EQUIPMENT SHOULD BE RETURNED

During the war a great deal of apparatus had to be scrapped because it was impossible to get it repaired on account of the scarcity of shop labor. Now that the labor situation is so rapidly improving, it will be possible to undertake much of this work, and the repaired equipment can be turned in to the storehouse to reduce purchases. The volume of material required for stock is appreciably cut down if certain goods are handled on an exchange basis, that is to say, if the company requires the delivery of an old piece every time a new one is delivered. Included in the

items so handled might be placed journal bearings, field coils, armatures, trolley poles, trolley catchers, headlights, tools and many similar pieces of apparatus capable of being promptly repaired, turned into stock and reissued.

Articles have appeared in recent periodicals describing the savings made by the reclamation section of our army in France. Is our need less?

#### HOW TO CONDUCT A "PICK UP" CAMPAIGN

Winter will soon be over and spring housecleaning time will be upon us. For the past ten years our company has conducted periodical "pick up" campaigns which have been nothing more nor less than a systematic housecleaning of the whole property. Those will understand what I mean who have moved occasionally and found in the attic and in the cellar articles of furniture or household use that had been placed there intended for some possible future use. Perhaps it was a baby carriage, and the baby had grown to be ten years old, or perhaps an old phonograph or an old heater, all of which were promptly discarded rather than moved to the new home.

We form a committee of the storekeeper, division superintendent, track supervisor and division master mechanic, and they, with a gang of men, visit every shop, office, station or other point where material is used and go into each corner from cellar to attic. It is determined right on the ground what is useless at that particular point, and such items are loaded up and taken back to the storehouse. They might be simply surplus stock, material not required at that point on account of a change in the equipment operating from there, or they may be obsolete because of change in design. By far the larger percentage of all the material thus collected is good and capable of being used elsewhere. The rest of it may be scrap for which ready market is always found.

When the plan was started, considerable opposition developed until the nature of the work was understood. But when the local officials learned that they were not to be deprived of anything they required, they welcomed the idea, realizing that we were helping them to do things they themselves should have done but were prevented by lack of time or by not conceiving the idea. They also knew that as their immediate superior was along and helped to determine what should be taken, they would be relieved of adverse criticism for not keeping enough material on hand.

It was not unusual for us to pick up from \$10,000 to \$15,000 worth of materials on such trips. On trips soon after the scheme had been started many items were gathered that had been unnecessary or obsolete for five years or more. There is a double incentive for making a "pick up" campaign this spring.

#### NEEDS SHOULD BE CAREFULLY ANTICIPATED

When a job is contemplated which requires extraordinary quantities of material or materials not usually carried in stock, it is well to make up a "bill of material" and not attempt to proceed with the work before sufficient stock is available to avoid interruption. Furthermore, before arrangements are made for the purchase of such materials, it is well to be reasonably sure



that the proposition will hold water and be prosecuted to a finish. Everywhere one finds that plans are made involving the use of considerable material purchased for the purpose which fall flat for various reasons and the result is that materials unsuitable for other purposes remain on hand, usually involving a total or very considerable loss.

Why not concentrate the responsibility for the stocks of unapplied materials for the property as a whole, regardless of where they are located? Give the officer in charge corresponding authority and the full co-operation of the management, have him sign all requisitions for materials to be purchased as assurance that such materials are not available from some other portion of the property so as to avoid purchase, and look to him for results?

## Appreciation Means Much

Suggestions as to How the Efficiency of the Work Done on an Electric Railway Property Can Be Increased

BY EDW. C. SPRING

Superintendent of Transportation, Lehigh Valley Transit Company, Allentown, Pa.

"Render to Cæsar the things that are Cæsar's and to God the things that are God's."—Mark xii, 17.

**N**O MAN lives unto himself alone, neither does any business these days. We are prone to forget and lose sight of the deeds of others, to forge ahead expecting results to follow in our path without first paving the way for efficient work. We are not willing to give credit where credit is due, to recognize the ability of those that make up our organization and encourage them by our appreciation of their meritorious acts.

Appreciation and encouragement are vital essentials that help make efficiency in service. Where there is the chief of a department whom the chief executive of a railway company cannot or will not encourage, the department should have a new chief.

The secret of co-operation in large undertakings lies in the appreciation of service from the managerial head. The manager of a large industry is placed there for his ability to encourage his subordinates to the highest degree of efficiency.

It is universally admitted that the successful man is the one who can get the most out of his subordinates. This is considered to be the basic requirement of any executive.

A splendid example of this was in the placing of Charles M. Schwab as director general of the Emergency Fleet Corporation. Mr. Schwab's great success lies in the encouragement of others, by showing his appreciation of service rendered by others. He is a co-worker with all, from chief assistant to clerks.

"No man ever worked for me in my lifetime, but many thousand men have worked with me, and that is what I want you men to do. We in Washington do not deserve the credit for this," said Schwab, addressing the Camden clans who put the *Tuckahoe* over in record-breaking time, "it is the management here. It is the foreman on the ship, the foreman under the ship and the workmen in all parts of the ship that deserve the public credit for what they have done here, and I shall be the one to see that they get it. The people are winning the war. God please, you workmen have your

hearts as full of patriotism as mine, and to hell with the Kaiser every time you drive a rivet."

Mr. Schwab keeps his wholesome humanity at all times. Always a democratic person, it is largely this trait that has put him at the head of the country's greatest steel industry.

Appreciation costs little but accomplishes much; it is the vital asset to great results.

We are living in an era when much must be accomplished by the little and what we lose by diminution of our ranks must be met by speeding up on the part of the others. It is a time when the seemingly impossible must be accomplished, when heads are called upon to meet conditions which are entirely new and which must be worked out in the quickest possible time. Power and equipment increase, and difficult transportation problems, not to speak of the grave financial difficulties attendant upon high costs and insufficient revenues, are all potent factors which must be met and solved with the greatest dispatch and accuracy.

This calls for the combined efficiency of the entire organization, necessitates that each man must be made to believe in his individual importance in speeding up production. He must be encouraged and spurred to the fullest action that his highest efficiency may be given to the work to be done. A word of appreciation to an employee will bring about a hundredfold in results. It is appealing to the man's human side, and when you do this you hit the vital spot in his make-up.

Are we doing our part in our various organizations in speeding up to meet and keep apace with the great commercial activities of the hour?

We have run our properties too much like unto a machine with each employee as a necessary cog in the wheel, without regard to his possibilities. Let us give the needed encouragement, and then we will have added greater efficiency and, what is more, can also demand it.

The air is full of encouragement, encouragement to our boys who have so nobly represented our country overseas. The great generals in the World War have realized the imperative need of the fighting element being keyed to the highest possible point in the life of the soldier. To this end the award of medals for bravery and distinguished service has been made so that it has been the highest ambition of every man in the service to obtain one of these coveted prizes. The foreign nations have always set us an excellent example in this respect.

Heads of industrial concerns have offered bonuses in the form of stocks in the company, together with promotions to stimulate the personnel of their organizations. All of this is along the right lines. The more closely you keep the employee in touch with his company, the sooner he will feel his part in the big game, and where he has a personal interest, say as a stockholder, you can more forcibly put home to him the economic side of the operation. It is wrong for us to class our employees as machines, what we want are real human beings with red blood, who can think and act quickly, ready to meet and cope with any emergency.

A large proportion of the electrical industries of the country have not looked far enough into the future of their properties in the encouragement and appreciation of the work of their employees. We are being called upon to-day, as during the war, to develop and produce

ways and means for power, light and transportation to meet the abnormal demands of the country, to carry to completion problems of enormous magnitude. To bring about the best results in our individual work, we must give the encouragement and the appreciation to others which rightfully belong to them. This will incite to greater efforts and is creative of that most valuable business asset, loyalty, which builds up a spirit of team-play in any business force.

Begin now to appreciate others, and the results which every manager is looking for will surely follow.

Watch the results of this business efficiency and feel the effect upon yourself, as you observe the new light break upon one in your employ who has needed that little word of encouragement to develop those talents most necessary to your interests.

There may not be much in the things that you say—it's the way that you say them;

The kind of games that you play doesn't count, it's the way you play them.

In palace or cottage, in office or ditch or wherever you're working,

The test of your manhood is answering this, Are you striving or shirking?

And Life at the best only gives back again to you that which you gave it;

So high life or low life means nothing at all—it's the way that you live it.

---

## LETTER TO THE EDITORS

---

### A Subscriber for Thirty-Five Years Renews

NEW YORK CITY, Feb. 24, 1919.

To the Editors:

I have been interested in the energetic efforts the ELECTRIC RAILWAY JOURNAL has recently made in spreading the work you are doing in keeping up and increasing its circulation, and while such efforts will doubtless prove profitable to its owners, it will also serve its purpose in keeping all who are directly or indirectly connected with street surface and interurban railways unusually well informed on all subjects so important to those interests.

In looking back I recall the encouragement I gave to the undertaking of the STREET RAILWAY JOURNAL (the prior title of your publication); I felt it would accomplish just such beneficial results as it certainly has done, upon which it gives me great pleasure to congratulate you and your able staff as well as those of your predecessors.

If my recollection is correct, the first issue of the STREET RAILWAY JOURNAL contained the obituary of my honored father who had served the Brooklyn City Railway Company as its secretary in the early age of street railways, and who died in October, 1884. The notice and his picture appeared on the front page of that issue.

I very distinctly remember, as an operator of horse and electric railways, your journal furnished me a serviceable implement in the progress of my work.

As a manufacturer of railway supplies, it served me as an important factor in enlarging that business.

As a broker, in the placing of full issues of public utility securities and arranging loans on such securities, it proved of value, keeping me in close touch with

the rapid and many developments and operations in this important field.

I trust the response to your efforts will be handsomely rewarded by a substantial increase in subscribers, and that your journal may continue to lead in usefulness as it has for so many years in so ably presenting to its readers all matters affecting the interests and welfare of electric railways.

Inclosed find check in renewal of my thirty-sixth yearly subscription.

DANIEL F. LEWIS.

---

## AMERICAN ASSOCIATION NEWS

---

### Mid-Year Meeting Announcements

A CHANGE has been made in one of the speakers for the annual dinner of the American Electric Railway Association on March 14. Senator Harding, who was scheduled for an address, will be unable to be present and in his stead the committee has secured an acceptance as a speaker of Francis Burton Harrison, governor-general of the Philippine Islands.

The dinner for the ladies at the mid-year meeting will be served in the East room at the Waldorf-Astoria at 7 p.m. The charge will be \$5 a plate and applications for dinner tickets should be sent at the earliest possible moment to the offices of the association. As mentioned in the program published last week, before the speaking in the main Banquet Hall begins, the ladies will be conducted to seats in the gallery boxes, and at the termination of the dinner, an informal dance will take place in the Astor Gallery, adjoining the main ball room. Mrs. J. H. Pardee will head the list of patronesses, assisted by the following ladies: Mrs. R. M. Campbell, Mrs. E. D. Kilburn, Mrs. N. M. Garland, Mrs. E. N. Chilson, Mrs. E. S. Fassett, Mrs. J. J. Sinclair, Mrs. W. P. White, Mrs. George Keegan, Mrs. C. R. Ellicott.

### Information for Company Section Members

PRESIDENT L. S. STORRS of the Connecticut Company has supplied to the members of the local company section, No. 7, some leaves for insertion in a loose-leaf notebook of pocket size containing information regarding the company and the electric railway industry. This first instalment is headed "Bulletin No. 1," is dated March 1, 1919, and is introduced with the following words:

"It is of the utmost importance that you should be familiar with every important fact of public interest concerning the Connecticut Company. For that reason you are asked to read carefully the slips which are sent you for insertion in the loose-leaf binder which was sent you some time ago. This information is for the purpose of making it possible for you to acquaint the public, when occasion requires, with our condition and the causes of it. If you have need of additional information, do not hesitate to call upon me for it."

Following are the sections comprising Bulletin No. 1: Present-day conditions; control of Connecticut Company; financial standing of company; burdens placed upon company; the jitney question; abandonments, receivership and foreclosures; fundamental causes of breakdown of industry; increased cost of material; care of property; importance of service, and question of fares to be charged.

# News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

## Boston Committee Reports

### Mayor Peters' Committee Recommends That Subway Rentals Be Continued and Dividends Reduced

A committee named by Mayor Peters of Boston, Mass., to investigate various financial questions associated with the operation of the Boston Elevated Railway recently made a report recommending certain proper courses of procedure. The committee as originally appointed consisted of Alexander Whiteside, chairman; Louis K. Liggett, Greenville S. MacFarland, Michael J. O'Donnell, Bentley W. Warren, Charles F. Weed, and Dr. William C. Woodward. Subsequently Thomas F. Sullivan was added and recently Mr. Weed resigned and Edmund D. Codman was appointed in his place. The recommendations made by the committee are summarized below:

1. The trustees and the management should be allowed a fair chance to work out their problems without further legislative or other public action, except possibly in regard to the proposed purchase of the Cambridge Subway by the state and the elimination or reduction of dividends to common stockholders of the Boston Elevated Railway and to stockholders of the leased West End Street Railway.

2. No staggering of hours should be attempted.

3. A careful study should be made by the trustees and by the Boston Transit Department of plans to relieve congestion at Park Street and other important points, special attention being given to the advisability of building a subway from Boylston Street to Post Office Square.

4. A careful study should be made by the trustees and the management of means to reduce the evils involved in stealing fares.

5. The present 8-cent fare should be continued unless and until a satisfactory and workable zone system can be established.

6. The system should not be operated under public control except as at present by the trustees, and a careful study should be made of the advantages and disadvantages of public ownership.

7. The State should purchase that part of the Cambridge Subway now owned by the company, but it should carefully consider whether the rental should not be 4 per cent of the purchase price instead of 4 1/2 per cent.

8. The company should not be relieved of the obligation to pay subway rentals.

9. Until the company can be operated profitably, no dividends should be paid to Boston Elevated common stockholders or to West End preferred or common stockholders.

Messrs. O'Donnell, Sullivan, Whiteside and Woodward favored the last two recommendations, but Mr. Warren dissented and also from the part of the first one that related to the elimination of dividends. In a separate report he recommended the following substitutes for the sections dissented from:

1. The persons using the Boston Elevated Railway facilities should be relieved, during the period of public control, of all taxes, and all paving and street maintenance obligations, imposed by law upon the franchise of the company, which are devoted to transportation, and also from a part certainly, and perhaps from all, of the expense of removing snow and ice from the highways.

2. It is wise public policy to postpone the consideration of the proposal to relieve the car-riders of the burden of paying the subway rentals during the period of public control, until the next session of the Legislature when the results of a full year's operation under that public control will be known and both the Legislature and the city will be better able to deal in an intelligent way with the question.

## Rapid Transit Proposal Made

### Cleveland Considers Asking Voters to Approprate Money for Initial Rapid Transit Line

At a meeting of the Rapid Transit Commission of Cleveland, Ohio, with Fielder Sanders, Street Railway Commissioner, on March 3, the question of submitting a bond issue to a vote of the electors on Nov. 4 was discussed. The funds from the proposed issue would be used for the construction of the first unit of the rapid transit subway under the Public Square.

#### SUBWAY TERMINAL SUGGESTIONS

M. M. Brinckerhoff, of Barclay Parsons & Klapp, who are making a survey of traffic conditions preliminary to recommending plans, outlined suggestions for a subway terminal and stated that the plans will be completed by May 1. This terminal will have five units, all arranged to make a complete whole, but the construction of only one at a time will be undertaken. Decision as to which shall be undertaken first will depend upon conditions at the time.

It is probable that the first bond issue will be for \$5,000,000. As the work progresses other issues will be authorized, but the idea of the commission now is to build the terminal and short radiating lines which will relieve the congestion in the streets in the downtown retail and wholesale sections.

Mr. Brinckerhoff gave the locations of entrances to the subway terminal and said the tracks would be placed 28 ft. below the surface. Details of construction will depend somewhat upon the final decision as to building a union passenger station on the Public Square, as has been planned. Arrangements will be made for an underground entrance to that building, if it is constructed.

#### MUNICIPAL OWNERSHIP RESOLUTION

At a meeting of the City Council on March 3 the resolution prepared by Mayor Harry L. Davis, arranging for the submission of the municipal ownership question to a vote of the electors, was referred to Director of Law Fitzgerald for revision. It is said the wording of the resolution may convey the idea that Council is committed to municipal ownership. The members do not care to create that impression at this time.

## City Threatens Competition

### Detroit Street Railway Commission Wants \$10,000,000 for Initial Experiment in Municipal Ownership

The Street Railway Commission of Detroit, Mich., the Mayor and the members of the City Council met in executive session recently to go over the railway situation again in the light of the recent developments with respect to the commission's purchase proposal to the Detroit United Railway, the company's counter leasing proposal and the rejection of this last by the city. At the conclusion of the joint meeting it was announced that the Council had been asked to pass an ordinance amending the city charter in such a manner as to permit of the issuance of \$10,000,000 of bonds to be rated as public utility bonds outside of the 4 per cent limit imposed by the new charter. This authorization will require submission to the electorate at the April election in the form of a charter amendment.

Two members of the commission have been delegated to map out a system of municipal lines with a view to presenting a plan to the commission soon.

The official communication from the Street Railway Commission to the Common Council contained this reference to the construction of municipal lines as the solution:

The railway company having rejected what we considered to be a fair and honest price for the property it appears to us that the course which the city should now pursue is the acquisition of a railway system by construction and by purchase of roadbed where franchises have expired. Accordingly we believe that at the April election a proposition authorizing the issuance of public utility bonds to an amount not to exceed \$10,000,000 for the acquiring of a railway system should be submitted to the voters of this city. We believe that such an amount will permit the city to improve the transportation facilities greatly and, in time, allow us to make the city system exclusive.

The plan which we propose to your honorable body in the form of an ordinance has been made sufficiently broad to permit the city's making use, in part, of superior or elevated types of railway should such action be deemed advisable. Obviously, no routes could be specified in the brief time which the commission has had to prepare this measure, but it is our intention to plan immediately for the building of new railway lines in territory not now served as well as over territory now traversed by the Detroit United Railway on which its franchise rights have lapsed.

In consideration of this ordinance we will be pleased to supply your honorable body with all of the data and information of which we are in possession. Our earnest desire is to proceed with all possible sincerity on a course that we believe will end the difficulties which have hampered the development of the city for many years.

It seems, however, that the field is not to be left entirely to the electric railway. There is a counter proposal that the city shall put its money into motor-bus lines.

## Terms of London Strike Settlement

### British Observer Reviews Peculiar and Interesting Features of a Strike that a Little Sagacity by Labor Might Have Prevented

In the beginning of February the whole of the great system of underground electric railways in London, England (with a minor exception under separate management), were paralyzed for a week by a strike of the employees. This was the first time in their history that such a stoppage had occurred. The inconvenience to the public was enormous, as the tramways and the motor omnibuses were quite unable to cope with the traffic thrown upon them. In the mornings business was disorganized through people being late in arriving at work; in the evenings the public were much delayed in getting home. Enormous numbers had to walk.

#### NO WARNING OF TROUBLE

The trouble began with little or no notice on the morning of Feb. 3 when the motemen refused duty because their half-hour interval for a mid-day meal was not to be counted part of their newly established eight-hour day. The men employed in the Chelsea power station, which supplies the underground railways, also knocked off, and for the first time in its existence that great establishment was motionless.

Never during their existence had the London tramways ever done such a business. The creditable nature of their performance and of the work of the management is the greater when one remembers the necessarily imperfect maintenance of track and rolling stock during the war and the shortage of employees. Perhaps even greater were the difficulties faced by the London General Omnibus Company, as it serves, among other areas, those not provided with tramways.

The strike lasted for a week, the service on the underground railways being resumed to a certain extent on the afternoon of Feb. 9, and more fully on Feb. 10 and following days.

#### CONDITIONS ON UNDERGROUND LINES

The conditions of work on the underground railways are different from those on the main steam lines, as the services are comparatively local, the men are never far from home, and there is no goods nor mineral traffic. In connection not only with the motemen, but the men on night shift carrying out running repairs on the trains, the agreement entered into after the general railway strike of 1911 (which only partially affected the London underground railways) when the scheme of conciliation boards was put into operation, was such that the length of the shift was reckoned at from nine to nine and one-half hours, inclusive of a short relief time for meals. Payment was at so much per shift, and in the event of overtime being worked the rate per hour was calculated as though there had been no relief time in the shift. That is to say, in the case of a nine-hour shift the rate per hour was reck-

oned at one-ninth of the amount received for the full shift. There should thus be no misapprehension as to the fact that meal times were paid for.

In August, 1917, a large section of the railway employees of the country made a demand for an eight-hour day. The government then as now was in control of the railways. It refused the request, but promised that a claim for a shorter working day if put forward immediately after the close of hostilities in the war would have sympathetic consideration. In consequence of this promise the principle of an eight-hour day for all members of the wages staff and the railways was conceded in December last. The government contended that what was granted was an eight-hour working day exclusive of meal times, and this apparently suited the existing conditions on the main line railways of the country, but not on the London local railway. The eight-hour day came into operation on Feb. 1, with a provision that all outstanding points and the methods of application were to be settled afterwards by conference between the trade unions, the Railway Executive Committee (which manages all the railways of the country under government control) and the government.

#### THE MEN'S POINT OF VIEW

Anger arising from personal inconvenience and dislocation of business rather blinded the public to the underground man's point of view, and certainly little prominence was given to it in the newspapers. No doubt it was unjustifiable to cause so much trouble and loss over a comparatively trifling subject, but on the other hand, the underground men felt that, while an advantage was being given to main-line men under the eight-hours scheme, what was given to them with one hand was being taken away with the other. There are two trade unions connected with British railway service, the National Union of Railwaymen, which has much the larger membership, and the Associated Society of Locomotive Engineers and Firemen, the members of which consider themselves the elite of the profession. The fact that there are two unions to deal with instead of one and that there is much jealousy and rivalry between them adds greatly to the troubles of the railway companies. When the A. S. L. E. called its men out on strike on Feb. 3 people were puzzled, in view of an agreement which had been signed on Jan. 30. The union based its demand on the previous agreement made between the two unions and the government on Dec. 6 last which was as follows:

1. An eight-hour day for all railwaymen to be put into operation from Feb. 1, 1919.

2. All other conditions to remain as at present.

When it came near the time for application conferences were held on Jan.

29 between the president of the Board of Trade (representing the government), the railway executive committee and representatives of two trade unions. As a result the parties on Jan. 30 signed the following agreement:

The principle of the eight-hour day for railwaymen is to be given effect to as from Feb. 1 on the basis of existing conditions of service, and where it is not found practicable to reduce the working hours to eight, overtime to be paid for all time worked after the expiration of eight working hours. In calculating the eight hours, time allotted for meals will not be counted in cases where it has hitherto been so allotted; for example:

1. A man hitherto booked on at 6 a.m. and working continuously until 4 p.m. will, if booked on at 6 a.m., cease working at 2 p.m., or if he works later will be paid at overtime rate from 2 p.m.

2. A man hitherto booked on at 6 a.m. and working until 5 p.m. with a meal hour between (say) 12 noon and 1 p.m., will, if booked on at 6 a.m., cease working at 3 p.m. (with an hour's meal interval), or if he works later will be paid at overtime rate from 3 p.m.

Where a man's work has been arranged on a weekly basis overtime will be paid after forty-eight hours work; and as regards allotted meal times the principle set out in example No. 2 will apply, i. e., allotted meal times will not be counted in calculating working hours.

The above is without prejudice to the right of either side to claim different arrangements and the negotiations now pending.

Very possibly it was the case that the trade union representatives in signing this agreement had not in mind the peculiar conditions of the London underground service but were thinking only of the conditions on British railways generally which would not be so adversely affected. The total number of men employed on the London lines is, of course, small, compared with the number engaged on British railways generally. At all events the underground motemen got up in arms and the A. S. L. E. executive supported them. They declared, by referring to the agreement of Dec. 6, that the government had been guilty of a breach of faith.

#### UNCERTAINTIES

The wording of the original circular notices to the men was vague. The men assumed that the principle of the eight-hour day having been accepted, and all the other conditions being to remain in force, the eight-hour day was to include meal time (usually half an hour) in the same way as the nine or nine and one-half-hour day did. The agreement of Jan. 30 was considered as only applicable to the steam lines of the country on which goods and mineral traffic has to be dealt with. In fact it hardly seems conceivable that if the point had been directly brought before the secretaries of the two trade unions they would have agreed to a stoppage of pay for meal time on the underground railways.

The matter was further complicated by the fact that the agreement of Jan. 30 was not in the hands of the railway companies until Jan. 31, and that it was well known to the men that duty sheets had been drawn up on the basis of eight hours inclusive of meal time. The circular (for which the railway executive committee was responsible) stating that the eight-hour day meant eight hours work exclusive of meal time

came as a bomb-shell on the underground employees. The motormen struck and so the N. U. R. men were thrown out of work, including the power station and workshop hands.

It seems pretty certain that the railway executive committee was afraid to grant anywhere an eight-hour day inclusive of meal time, even where meal time had previously been included and paid for in the shift, for fear the granting of it in one case would prejudice the position of the main line railway companies in their negotiations with the trade unions which began on Feb. 12 and were expected to last some time. In these negotiations payment for meal times on all railways is one of the points brought forward by the unions. The difference between the conditions on the London Underground Railways, which operate a vast frequent passenger service mainly in tunnel, and those on main line railways where relief periods cannot be arranged for short times, makes it difficult to think that trouble would be experienced on the main lines through the granting of a concession to the underground employees corresponding to that which they enjoyed for the last six years.

#### THE SETTLEMENT

The trouble of having to deal with two trade unions was made conspicuous in the settlement of the dispute. As the result of negotiations the Board of Trade, the Railway Executive Committee and the A. S. L. E. on Feb. 6 came to an agreement the essential point of which was:

Meal time will not be included in the eight hours, but in the new conditions of the eight-hour day the companies will offer all reasonable facilities to meet the ordinary physical needs of the man.

This, like the previous agreements seems somewhat ambiguous, but it was adopted as a temporary arrangement pending the approaching consideration of the general conditions of service. When the public expected a resumption of the traffic on this solution being adopted, they were disappointed, as the N. U. R., which had previously condemned the strike, came on the scene, refused to accept the arrangement, and declared a strike of their men. Another conference was set going, with the result that early on the morning of Feb. 8 the N. U. R. executive agreed to exactly the same terms as those already accepted by the A. S. L. E. The additional provision secured was, however, that, pending the completion of new duty sheets, a man should be nominated for each railway to assist the companies in seeing to the proper carrying out of the arrangements for securing reasonable facilities to meet the ordinary physical needs of the men, which facilities are to be included in the eight-hour day.

The whole matter is a story of cross-purposes and the details may be instructive to railway employers and employed in America. Seeing that complete negotiations on every outstanding question were near at hand, a little patience would have saved all the trouble.

## Promoting Better Labor Relations

### Public Service Adopts Collective Bargaining—Increases Life Insurance, Sick Benefits and Pensions

The Public Service Railway, Newark, N. J., as briefly announced in last week's issue, has accepted the principle of collective bargaining approved by the National War Labor Board. All questions which arise between employer and employees are to be settled by giving the employees equal voice and vote in making adjustments, with ultimate arbitration if necessary.

In brief, the operation of the collective bargaining plan includes the creation first of branch committees representing the respective carhouses, shops or stations, to which the employees will elect two representatives and the company appoint two. These branch committees will form department committees. The members of each department committee for employees will elect two members to constitute a general committee, and the company will appoint an equal number of representatives for a like purpose. Thus, any question arising will be taken up by the proper branch committee at the point of origin and adjusted there or carried to the higher committees. Arbitration by disinterested persons is available when necessary, the Board of Public Utility Commissioners being the third arbitrator if one cannot be agreed upon by the arbitrators chosen by the two sections of the general committee.

Membership in the new Co-operative League will be voluntary and not restricted by union affiliations. No initiation fee will be required, but there will be dues of 50 cents a month. Permanent employees who receive less than \$2,500 yearly compensation will be eligible for membership. Each member will be entitled to receive a Prudential Insurance Company life insurance certificate for \$1,000, in his name, issued under the group plan. Should a member in good standing leave the service of the company he will be entitled to continue personally the \$1,000 insurance, without medical examination, at rates based on the insured's then attained age. Or, in the case of total and permanent disability occurring before the member reaches sixty years of age from causes arising after the issuance of insurance, the \$1,000 will be payable in monthly or yearly installments to the holder of the certificate.

The Public Service Railway, under its former welfare plan, paid out from Jan. 1, 1911, to Jan. 1, 1919, a total of \$634,853 in sick benefits, life insurance and pensions. Under this plan, which it is proposed the Co-operative League shall supersede, \$300 death benefits and \$1 a day sick benefits were paid as compared to the \$1,000 insurance and \$2 a day sick benefits of the new plan.

Compensation for injuries will be paid as heretofore under the provisions of the workmen's compensation act. The minimum pension under the welfare plan was \$20 a month. The

company has raised the pension rate 50 per cent with a new minimum of \$30 a month.

The company will continue to bear the costs it has previously borne, and, in addition, will pay into the Co-operative League treasury more than one-half of the added cost, leaving the membership dues to make up less than half of the extra expense involved.

Acceptance or rejection of the combination collective bargaining and co-operative league plans proposed by the Public Service Railway is a question for the decision of the employees and this decision will be final. This is the position taken by the railway and outlined by its representative, John L. O'Toole.

### Toronto Buys Suburban Line

By the terms of an agreement arrived at between representatives of the city and the Toronto & York Radial Railway, Toronto, Ont., the city has arranged to purchase from the company for \$590,000 the Yonge Street section of the Metropolitan Railway lying between its southern terminus near Farnham Avenue and the city limits, together with certain rolling stock, and the company's rights and franchise in connection with this section.

In return the city agrees to allow the Toronto Railway to carry on its lines the package freight and express goods of the Metropolitan, and upon its acquisition of the Toronto Railway to furnish and operate cars for the carriage of such goods from the city limits to terminal stations which, the agreement provides, will be established by the York Radial Railway at St. Lawrence Market and other points within the city.

The agreement to purchase is the result of private negotiations carried through on behalf of the city by Works Commissioner Harris, Finance Commissioner Bradshaw and City Solicitor Johnston. It awaits the approval of the City Council and ratification by the Provincial Legislature before becoming operative.

### Mr. Starring in San Francisco

Mason B. Starring, president of the California Railway & Power Company, New York, N. Y., which controls the United Railroads, San Francisco, Cal., is in San Francisco in connection with the plans for the financial readjustment of the San Francisco company. He is reported to have said that the readjustment would in all likelihood be carried out on the plan made in September, 1916, and amended subsequently, providing for a reduction of the capitalization. With respect to the matter of the city taking over the lines of the company, Mr. Starring is reported to have said:

About a year ago there was much talk of the city of San Francisco taking over the United Railroads. The city engineer was instructed to make a valuation for the purpose. I may say that the United Railroads is willing to accept a reasonable offer if the city wishes to make one. I

believe that if the people of a city desire municipal ownership then municipal ownership is the right thing for such a city. I am absolutely in the dark as to the reason for the discontinuance of the plans for taking over the roads. As I see the situation it is a matter between a willing buyer and a willing seller.

I do not believe it will be necessary to raise the fares on the San Francisco railways, as has been done by traction companies in other cities. Though we have not paid dividends for several years, we are getting along on the 5-cent fares.

## Other Preparatory Steps

### Seattle Gradually Disposing of Details Standing in Way of Completion of Railway Purchase

A bill recently introduced in the Legislature at Olympia, Wash., by Representative Frank G. Myers of King County, offers protection for the deal made by the city of Seattle for the purchase of the railway lines of the Puget Sound Traction, Light & Power Company, the legality of which is now being tested in the Supreme Court. The measure validates utility bonds of cities and towns issued in the purchase of utilities, plants or systems. The bill provides:

Whenever a city or town has entered into such contracts and has agreed by ordinance to issue utility bonds in payment and has by ordinance created a special fund and obligated the municipality to set aside and pay into it moneys from the gross revenue of any municipal plant, then owned, including the property required, such contracts and ordinances are ratified, approved and validated to the fullest extent possible under the constitution of the State.

The corporate authorities of every city having such contract are empowered to consummate and perform all ordinances and contracts not yet fully completed.

The bill has been referred to the committee on municipal corporations of the first class.

A further move in the city of Seattle's purchase of the railway system of the Puget Sound Traction, Light & Power Company was recently made when the Council elected the Title Trust Company and the Washington Title Insurance Company to make the title search of the property involved.

## City's Purchase Right Upheld

In a seven to two decision filed on March 5 the State Supreme Court of Washington upheld the legality of the proposal of the city of Seattle to purchase the railway system of the Puget Sound Traction, Light & Power Company for \$15,000,000 in utility bonds. In anticipation of a favorable decision in the case both parties have gone ahead with the details. According to present plans the property will be delivered about April 1.

## New Office Quarters in Sherman

The Texas Electric Railway has leased the entire building at Travis and Lamar Streets in Sherman, Tex., the first floor of which is now occupied by the company as ticket office and baggage room. The second floor will be remodeled and refitted for offices. All trains between Dallas and Denison will be dispatched from Sherman. A clubroom for trainmen will also be provided.

# Utilities Are Facing Disaster

## Governors' and Mayors' Conference in Washington Recognizes Need of Electric Railway Industry

Problems of industry and labor, now confronting the country were discussed in Washington by officials of the government, Governors of the states and Mayors of large cities at a conference called by President Wilson on March 3, 4 and 5. The conference was formally opened by President Wilson, who urged that the federal, state and local governments work together "in steady and easing and facilitating the whole labor processes of the United States."

A resolution embodying the principal ideas offered by the delegates to relieve the present condition was adopted. This included recommendations for a reduction of freight rates on all building material; for a change in the present method of demobilization of troops, for the releasing of natural resources of the country, and for government assistance in averting serious consequences in the financial affairs of electric railways.

### IMPERATIVE NEED OF UTILITIES

The critical aspects of the electric railway situation had again been brought to the attention of President Wilson. P. H. Gadsden, chairman of the committee on national relations of the American Electric Railway Association, on March 1 had sent to the White House a letter reading in part as follows:

The electric railways of this country are faced with a problem. Already 100 companies, operating in twenty-nine states and representing one-tenth of the total electric mileage of the United States, have gone into the hands of receivers. A compilation of the operating statements of three hundred and eighty-eight of these companies for the first six months of 1918 showed a decrease in net income of more than 80 per cent. Since that statement was compiled, the National War Labor Board has fixed a standard of wages for the industry which has added over \$100,000,000 to its already greatly increased operating expenses. Almost every other industry has prospered during the war, notwithstanding the increased cost of operations. The public utilities constitute practically the only exception to this rule of prosperity.

H. B. Weatherwax, president New York Electric Railway Association, had also sent to Governor Smith of New York a letter stating that the desperate condition of the electric railway industry constitutes one of the grave industrial and economic problems of the nation and more particularly of New York State. He urged the necessity of bringing this question up for discussion at the conference in Washington. A telegram to the same effect was sent to President Wilson.

The resulting action on the part of the conference in Washington was the following recommendation:

The attention of the conference has been called to conditions existing in many parts of the country with respect to electric railways. During the war increases in pay were granted to employees through the influence of the federal government. The Society recognized that the high cost of living justified this action in the fullest sense. These corporations, however, found themselves bound by certain limitations in the way of franchise contracts with municipalities, and while the operating cost has increased in many instances the rates of fare have continued without change. This is noticeably true in states where no

statutory provision has been made for an appeal to the state utilities commission. We disclaim any responsibility on the part of the rights of municipalities, but it is our earnest recommendation that the federal government should consider the situation with a view to averting serious consequences in the financial affairs of public utilities.

Eugene Meyer, Jr., managing director, War Finance Corporation, in the course of an address to the conference, made the following statement in regard to public utilities:

The public utilities are one of the big problems confronting us now. It is a problem of national importance from a financial and economic point of view because of the magnitude of the industry, and because it employs such a very large number of men it is a matter of interest to the Labor Department. Under normal conditions, the industry represents so much in the way of materials for maintenance, for track-laying, steel and iron, for lumber in the ties, for copper in the transmission wires, for motors, for machinery, for all kinds of building materials, that it cannot be ignored by you who are in contact with it or by the national government from the national point of view. It represents an investment of thousands of millions of dollars.

Its credit, however, has been materially injured; its values have been materially impaired. While there have been in the past, no doubt, many examples of mismanagement, and it may be shown in some cases that difficulties are due to overcapitalization, nevertheless, the vast majority which have been at work during the last four years, namely, constantly rising prices for materials and labor, combined with the demand for more investment to meet the changed conditions of costs.

I have no patent way of solving the problem, but I should advise you to have anybody in Washington to seek to impose any solution in a local territory for a local question. I should want to know if you had intimate contact with the problem, that I do consider that it is a big problem, and that this body should recognize it as a problem. Whatever the action of the conference may be on the subject, I think it can hardly afford to ignore the problem as a problem of national importance, both of local administration and local physical and financial control.

Is there anything that we in Washington can do? am sure I can speak for Secretary Redfield as desiring to be helpful if called upon, and I know that Secretary Wilson is deeply interested, and Secretary Glass has manifested a disposition to recognize the problem as a problem of national interest. Where there is any suggestion or hint of the President, which you can suggest, you will find everybody here in Washington ready to do anything and everything in the power to help.

## Sounds a Warning

Moses Blau, chief of the State bureau of inspection and supervision of public offices in Ohio, has called the attention of the Cincinnati officials to the fact that the actual cost of an extensive undertaking, like the proposed rapid transit loop, is always far in excess of the original estimate, and that it will be well for them to take this into consideration in making plans for its construction.

Computing the cost of the improvement at \$12,000,000, instead of \$6,000,000 as estimated, Mr. Blau states that the interest on bonds and the redemption fund will call for an annual payment of \$726,000, unless the loop becomes self-sustaining at once. His opinion is given at this time in view of the unsettled condition of finances and the dubious problem of taxation.

## News Notes

**Would Heat Ohio Vestibules.**—A bill requiring electric railways to heat car vestibules at not less than 60 deg. Fahr. between Oct. 31 and April 15 has been passed by the House of Representatives of Ohio.

**Service-at-Cost Bill in Indiana.**—A bill providing that a public utility may enter into arrangements with a municipality or with its customers to furnish service at cost has been introduced into the Senate of Indiana.

**Women to Remain.**—No more women conductors will be engaged by the Kansas City (Mo.) Railways, but none of those now employed who wish to remain will be discharged. There are now fifty women on the cars. Their work is satisfactory and has been so from the start.

**Indictments Against Trenton Men Dismissed.**—The Court of Errors and Appeals of New Jersey has dismissed the indictments against Rankin Johnson, president of the Trenton & Mercer County Traction Corporation, Trenton, N. J., and eight other directors and officials of the company for alleged usurpation of the streets of Trenton.

**Storm Ties Up Traffic at Cincinnati.**—On the afternoon of Feb. 28 a heavy wind storm, accompanied by rain, tied up many of the railway lines in Cincinnati, Ohio, for several hours and demoralized light and telephone systems for even a longer period. Several of the towns on the river below Cincinnati were also without service for some time and operation was hindered at Dayton, Ohio.

**Wants Mexican Tramways Returned.**—According to advices from Mexico City transmitted by way of Washington, representatives of the Mexico City Tramways have been sent to Mexico City by Canadian capitalists, principal owners of the company, to urge President Carranza to restore the property to the owners. The tramway was seized in 1916 while a strike was on in the city, and the government said it was acting to protect the property.

**Public Control Act Pronounced Valid.**—The Boston (Mass.) Elevated Railway public control act, passed by the Legislature last year, is constitutional, in the opinion of Attorney-General Atwell, as given to the Massachusetts Senate in response to a request from that body. He is quoted as saying that the provision for public management has the same effect as if the Commonwealth had taken a direct lease of the system, agreeing to assume interest charges and operating expenses and to pay the corporation a rental.

**Accident Trial Started.**—The trial of T. F. Blewitt, division superintendent, and five other officers and employees of the Brooklyn (N.Y.) Rapid Transit Company was started in the Supreme Court at Mineola, Long Island, on March 3 before Justice Seeger, who was designated to preside at the trial when the indicted men succeeded in having their cases transferred from the Brooklyn district. All are accused of manslaughter in connection with the wreck on Nov. 1, of a train on the Brighton Beach line when ninety-five persons were killed and more than 200 injured.

**Not a Howling Success.**—Jersey City's municipal jitney line up Newark Avenue from Exchange Place to West Side Avenue is not proving profitable and Director of Revenue and Finance Gannon may decide to cut down the fare from 7 cents to 5 cents to provide keener competition with the Public Service Railway. When the line was opened last month the fare was fixed at 7 cents in order to provide competition with the electric railway, which now charges 7 cents. Some of the jitneys have already been taken off the line.

**Paying for Their Homes.**—Of the 800 men who started buying homes in the Kansas City (Mo.) Railways Building & Loan Association not one case has come up in which the need arose for foreclosure. Under the Missouri law a man has six months of lapsed payments before he can be foreclosed and no man has ever been obliged to let his payments drop for that long. There has been no surrender or rights or ownership by any striker who was buying. The interests of these men are being guarded in view of their possible return.

**Progress with Railway Brotherhood.**—The Brotherhood of Trainmen of the Kansas City (Mo.) Railways is becoming more and more popular with the employees. The membership now numbers more than 500. During the past two weeks sixty-six were added to the roll. The organization is entirely in the hands of the men. A motorman is its president. This brotherhood is modeled after the Denver plan. Each member pledges himself not to strike, but to arbitrate all differences which may come up between the employees and the company.

**Seattle Needs \$73,082.**—According to a report of A. H. Dimock, city engineer, the city of Seattle, Wash., is short \$73,082 in funds necessary for the completion of the municipal elevated railway. According to Engineer Dimock, cash paid to date totals \$312,000; due on contracts, \$36,000; bills not rendered and unfinished work, \$37,000; total, \$385,000. The total appropriation for the construction is \$311,917, leaving a deficit of \$73,082. The line in question, which has been under construction since last spring, extends from First Avenue South and Washington Street to the West Spokane Street bridge over the West Waterway. Just what action the city will take to secure the needed

funds has not been decided upon by the utilities committee of the Council. Street railway utility bonds in the sum of \$400,000 were offered for sale by the city recently, but no bids were received.

**Women Replaced in Cleveland.**—The forty women on the cars of the Cleveland (Ohio) Railway as conductors retired at midnight on Feb. 28, as specified in the decision of the National War Labor Board. It was reported that they would bring suit to retain their positions, but Miss Rose Moriority, who has guided them in their fight, said this would not be done, as it would probably bring about another strike. What the women do expect, however, is a decision of the National War Labor Board, defining their rights of employment in the industries. They believe this will be so broad that it will result in their reinstatement as conductors. The National Women's Trades Union League, Washington, is pushing the matter and it is hoped to have a ruling in the near future. They feel that women's right to work will be greatly extended.

**Review of San Francisco Municipal Railway.**—More than half of the annual report of the city engineer of San Francisco, Cal., to the Board of Supervisors, which will be printed in the near future, is devoted to a comprehensive historical and statistical review of the Municipal Railway development in that city. There will be included operating statistics for the year 1918, during which time the system carried 62,500,000 passengers, and a statement of extensions and new construction. A series of charts will be used to set forth the nature of the various contracts awarded, condition of funds, increase in extent of the system and the amount of gross and net receipts. There will also be a discussion of the desirability of unified control and management of a city's street railway system and a review of the progress of the plan for purchasing the United Railroads, with which the municipal line is in competition.

## Programs of Meetings

### New England Street Railway Club

The annual banquet of the New England Street Railway Club will be held in Boston on the evening of March 27. It is hoped that the principal speakers will be Senator Watson of Indiana and Charles M. Schwab.

### Wisconsin Electrical Association

The eleventh annual convention of the Wisconsin Electrical Association will be held at the Hotel Pfister, Milwaukee, Wis., on March 26 and 27. An attractive program has been arranged. It will be announced later. Following the established custom, a joint session will be held with the Wisconsin Gas Association on March 26. The gas association opens its convention on March 25.

# Financial and Corporate

## Record Figures for Dublin

Increased Costs Were Overcome by Higher Fares and Traffic Gain of 4,384,000

The Dublin (Ireland) United Tramways had record receipts and expenditures for the year ended Dec. 31, 1918. The receipts gained £91,218 over 1917, while the expenditures rose £69,982 in spite of the deferment of some renewal expenses and the incidence of high wages for only a portion of the last year.

As to the items making up the large expenses of £310,946, it may be explained that the coal bill, even on a rationed supply of coal, reached £38,906—an increase of £8,580, while the whole cost of the power-station operation, amounting to £47,106, showed an increase of £10,634. The total power station operation as late as 1912 amounted to only £21,279, which was exceeded last year by £25,827—an increase of 120 per cent in six years.

The total maintenance showed an increase of £30,542. This addition was mostly in wages, as there was so little new material available to spend money on. The company spent £28,145 in maintaining the track, though only a few new rails out of a small stock in hand were put into the road.

### HIGHER FARES HELPED

If the tramway receipts had not been increased, the company would have been in a serious position, for the bare working cost for 1918 was at the rate of 11.13d. per passenger car-mile, which did not include any provision for standing charges such as debenture interest, and the total receipts per mile in 1917 were at the rate of only 11.08d.

In April the company for the first time increased the fares, which had been in many instances below the statutory limit. The company was also greatly helped by the general increase in traffic, owing to the large spending power of the public. This was shown by the fact that notwithstanding the higher fares charged, the company carried a total of 71,008,655 passengers or 4,384,329 more than in 1917.

As to how far this tendency to increased passenger traffic is going to continue, W. M. Murphy, chairman of the board of directors, says he cannot venture to forecast an opinion; but he is afraid that people are living through a period of artificial prosperity which must necessarily be of a temporary character.

The net available at the end of the year amounted to £117,492, and dividends, bonus and reservations absorbed £104,230 of this, leaving £13,262 to be carried forward to 1919. The reserva-

tions included £15,000 for the general reserve and £35,000 for relaying of track and replacing of ten cars.

### SYSTEMS IN PRIVATE HANDS

The Dublin United Tramways is one of the few important systems in Great Britain and Ireland remaining in the hands of private owners. The Bristol Tramways are still in the hands of a company, but the purchase period—which expired at the beginning of the war—was postponed by act of Parliament owing to the difficulty of purchase in war times.

The London United Tramways, situated just outside the limits of the lines controlled by the city of London, is another undertaking of some magnitude in the hands of private owners. The finances of this company, however, have just been readjusted and its capital scaled down more than one-half.

A number of smaller undertakings still in private hands are being conducted with varying fortunes. Results of operation are very good in the manufacturing districts where large employment and high wages are to be had, but on the south and southeast coast the business from pleasure traffic is still poor on account of the air raids during the war.

## Would Defer Bond Interest to Make Improvements

A very difficult situation has arisen in Pittsburgh in connection with the receivership of the Pittsburgh Railways. Urged on by the city of Pittsburgh the receivers of the railway practically petitioned Judge C. P. Orr in the United States District Court for permission to forego paying fixed charges for bond interest during the present year and instead to put the money into betterments of service in the different communities which the railway serves. Thus the issue as directly raised by counsel for the city is the matter of choice by the court between the interests of the community and those whose money is invested in the railway. Judge Orr from the bench, interrupting counsel for the city, said:

The situation here is very troublesome, with its implication that these bondholders should receive nothing on the money they furnished to establish the company. You will never be able to get a dollar of future capital investment unless payments are made on these bonds. It is a horrible situation. I don't know where it is going to end. I am looking ahead to a time when the bondholders, coming together, will assert their rights. We cannot confiscate property without compensation.

On the other hand Special City Counsel Robinson, addressing the court, said:

The choice must now be made between the interests of the whole community and of returns to private capital.

## Anticipating Possible Default

Committees Formed of Security Holders of New York Company Which Apparently Faces Collapse

Announcement was made on Feb. 28 that, in view of the failure of the Interborough Rapid Transit Company, New York, N. Y., to declare the usual quarterly dividend and the consequent danger of a default on the interest due on April 1 on the Interborough-Metropolitan collateral trust 4½ per cent bonds, a bondholders' protective committee had been formed.

Later in the day it was announced that a committee also had been formed to protect the interests of the stockholders of the Interborough Consolidated Company, which is a holding corporation. The company has two classes of stock. The preferred consists of \$45,740,000 of 6 per cent non-cumulative shares of a par value of \$100. There are 932,626 shares of common stock outstanding without par value.

The bondholders' committee consists of six bankers. Grayson M. P. Murphy, senior vice-president of the Guaranty Trust Company, is chairman. The other members are John McHugh, C. A. Peabody, C. S. Sargent, Jr.; James A. Stillman and Frederick Strauss.

The stockholders' protective committee is headed by Eugene V. R. Thayer, president of the Chase National Bank. The other members are Chellis A. Austin, Harry Bronner, M. M. Buckner, Charles Hayden and Edwin S. Marston.

On behalf of the bondholders' committee Mr. Murphy issued this statement:

The committee has been formed not only to protect the interests of the securities that it represents but also to endeavor to assist in straightening out a situation which threatens a great number of investors and which may seriously affect the credit of the city and State.

The committee has no preconceived plans. A thorough investigation will be made at once, and the action of the committee will depend on the facts developed by that investigation.

With reference to the formation of the stockholders' committee the following announcement was made:

In view of the unsettled and unsatisfactory position of the transportation lines for some months, and particularly in view of the public announcement of the possibility of a default on the semi-annual interest due on April 1 upon the Interborough-Metropolitan collateral trust 4½ per cent bonds, for the protection of which a committee has been organized, it has been decided to have a similar committee in the interests of the holders of the preferred and common stock of the Interborough Consolidated Corporation.

Stockholders are requested to deposit their certificates with the Mercantile Trust & Deposit Company, New York, N. Y., which will issue the customary temporary receipts. A deposit agreement is in course of preparation, copies of which may be obtained from the depository as soon as completed. The secretary of the committee is Charles E. Mackay, 115 Broadway, while Rushmore, Bisbee & Stern are his counsel.

Interest on the Interborough-Metropolitan Company's collateral trust bonds is guaranteed by the Interborough Consolidated Company. The income of the latter company is derived from dividends the Interborough Rapid Transit Company, the operating concern, pays on its stock.



## War Traffic Helps Richmond

Railway Revenues of Virginia Company Jumped \$901,000 or 27.7 Per Cent—Expenses Up \$597,000

The gross revenues of the Virginia Railway & Power Company, Richmond, Va., in both the railway and light departments, showed large gains for the fiscal year ended June 30, 1918. This was caused principally by the location of Camp Lee near Petersburg, the naval operating base at Norfolk and various other governmental activities in and around Richmond.

The gross operating revenues increased \$1,413,034 or 23.38 per cent. The larger part of the increase resulted from the operation of the railway department. The gross revenues

stock and the October, 1917, dividend of \$179,242 on the common stock, however, were paid. The surplus at the end of the year was \$1,270,776.

The revenue passengers in the year ended June 30, 1918, increased 12,838,418 to a total of 82,645,749, while the transfer and free passengers decreased 711,629 to 17,154,194. The average fare per passenger was 4.1 cents, a gain of 0.4 cent. The car-miles totaled 14,208,730, an increase of 661,086; and the car-hours 1,669,615, an increase of 51,400. The total revenue per car-mile amounted to 29.3 cents, a gain of 5.3 cents, and the operating expenses per car-mile 17.5 cents, an increase of 3.6 cents. The car-hour revenue was \$2,491, a gain of \$0.478, and the operating expenses \$1.486, an increase of \$0.322.

Chace, Providence, said he would not offer any objection to either Mr. Swan or Mr. Green.

Attorney Frederick W. Tillinghast stated that N. W. Smith, attorney for the New Haven Railroad, was unable to be present, but that he had been assured by him the New Haven road, which is a creditor of the Rhode Island Company in the sum of \$4,000,000 and in addition owns the entire capital stock of the Rhode Island Company, did not consider Mr. Green objectionable.

Attorney General Rice proposed the name of Zenas W. Bliss and no opposition was made.

John J. Fitzgerald, attorney for the carmen's union, stated that the three men named were favored by his clients. The carmen are vitally interested in the conduct of the Rhode Island Company, as at present there is a sum aggregating about \$150,000 due them for back wages, which was awarded by the War Labor Board but not paid as the company went into the receiver's hands before the second installment was due.

Attorney Tillinghast informed the court that he had drawn an order to be entered in the form of a decree, if satisfactory to the court, defining the powers of the receivers. It had the approval, he stated, of Clifford W. Whipple, attorney for the Rhode Island Company, and others.

Walter F. Angell of Edwards & Angell, representing the United Traction & Electric Company, said that he had not examined the decree and he would like to do so before it was formally entered. Accordingly the matter was deferred.

## Rhode Island Bondholders Organize

The United Traction & Electric Company, a New Jersey corporation owning the major portion of the railway lines operated under lease by the Rhode Island Company, Providence, R. I., for which permanent receivers have been appointed, has appointed a committee of the bondholders for the purpose of protecting the rights and interests attaching to the securities.

The Rhode Island Company has defaulted in payment of its rentals, aggregating \$225,000, and as a consequence payment of interest on the 5 per cent bonds of the United Traction due on March 1 has been indefinitely deferred.

The holders of bonds are urged to deposit their holdings immediately with all interest warrants attached, with either the Rhode Island Hospital Trust Company, Providence, or the First National Bank, Boston, as depositories under a deposit agreement in course of preparation. The depositories will issue temporary certificates which may be exchanged for transferable certificates of deposit.

Philip L. Spalding is chairman of the committee. The other members are Stephen O. Metcalf, Henry D. Sharpe, Malcolm Chace, Eben N. Littlefield, G. C. Lee and W. P. Goodwin.

### INCOME STATEMENT OF VIRGINIA RAILWAY & POWER COMPANY FOR YEARS ENDED JUNE 30, 1917 AND 1918

	1918		1917	
	Amount	Per Cent	Amount	Per Cent
Revenue from railway operations	\$4,158,594	55.76	\$3,256,791	53.88
Light, power and gas revenues	3,298,935	44.24	2,787,704	46.12
Total operating revenues	\$7,457,529	100.00	\$6,044,495	100.00
Railway operating expenses:				
Maintenance of way and structures	\$301,812	7.26	\$238,681	7.33
Maintenance of equipment	264,283	6.36	201,849	6.20
Traffic expenses	7,915	0.19	8,707	0.27
Transportation expenses	1,494,949	35.95	1,095,157	33.63
General expenses	411,487	9.89	338,294	10.38
Total	\$2,480,446	59.65	\$1,882,688	57.81
Light, power and gas expenses	1,620,046	49.11	1,058,604	37.97
Total operating expenses	\$4,100,492	54.98	\$2,941,293	48.66
Operating income	\$3,357,037	45.02	\$3,103,202	51.34
Other income	115,969	1.55	98,391	1.62
Gross income	\$3,472,902	46.57	\$3,201,593	52.96
Taxes and licenses	\$466,173	6.25	\$387,672	6.41
Interest, sinking fund and rentals	1,458,204	19.55	1,429,385	23.65
Discount on securities	30,316	0.41	40,315	0.49
Miscellaneous	89,762	1.20	162,133	2.69
Total	\$2,044,455	27.41	\$2,009,505	33.24
Net income	\$1,428,447	19.16	\$1,192,088	19.72

from this department gained \$901,803 or 27.7 per cent, the passenger gain amounting to most of this or \$857,057. The light, power and gas revenues advanced \$511,231 or 18.4 per cent.

The total operating expenses rose \$1,159,199 or 39.41 per cent, this increase being divided \$597,757 or 31.8 per cent for the railway department and \$561,441 or 53.0 per cent for the light, power and gas departments. As a result the income from operation gained only \$253,835 and the net income \$236,359.

In addition to the charges for maintenance of way and equipment, the sum of \$447,451 or 6 per cent of the gross revenues was credited to the reserve for depreciation and charged against surplus. The balance in the reserve as of June 30, 1918, was \$628,858. Capital expenditures for the year totaled \$444,438, of which \$256,745 was for the railway department.

On account of the necessity of making improvements and extensions to take care of war service demands, the directors decided it to be wise to conserve the cash resources. For that reason the dividend on the common stock, usually paid in April, was passed. Dividends of \$479,952 on the preferred

## Three Receivers for Rhode Island Road

Frank H. Swan, Theodore Francis Green and Zenas W. Bliss were appointed permanent receivers of the Rhode Island Company, Providence, R. I., by Presiding Justice Tanner in the Superior Court of Rhode Island, on March 4.

John J. Orr & Sons, the petitioners for the receivership, were represented by Attorney Edward A. Stockwell. He suggested that Mr. Swan's appointment be made permanent. The attorneys representing the respondents were in favor of the suggestion.

Rathbone Gardner, chairman of the federal trustees of the Rhode Island Company, whose terms expire in July but who have applied to the United States Court of the Southern New York District for an extension of time in which to dispose of the road, nominated Theodore Francis Green, secretary of the trustees, as co-receiver.

Attorney General Rice objected to Mr. Green's appointment, declaring that he was opposed to the selection of any person who had been connected with the conduct of the Rhode Island Company. City Solicitor Elmer S.

### Eight Years of Progress

Philadelphia Rapid Transit Issues Summary Showing Gains Since Rehabilitation Began in 1911

The Philadelphia (Pa.) Rapid Transit Company has issued in the form of a postcard folder a striking summary of progress from 1911 to 1918, inclusive. In 1910 the company found itself with credit exhausted, earnings insufficient to cover fixed charges, labor threatening and service bad. The Stotesbury-Mitten management then took up the work of rehabilitation, with the results shown in the accompanying tables and the following summary:

**Passengers Carried:** Increased over 70 per cent or more than 320,000,000 passengers. This showing is deemed particularly gratifying in view of the greatly increased use of automobiles.

FARE, WAGE AND DIVIDEND STATISTICS OF PHILADELPHIA RAPID TRANSIT COMPANY DURING 1910-1918

Calendar Year	Passengers Carried	Fare per Passenger (Cents)	Wages of Trainmen (Cents)	P. R. T. Dividend (Per Cent)
1910*	445,599,008	4 13	23	None
1911	520,425,581	4 07	23½	None
1912	553,471,846	4 03	25	None
1913	584,721,865	4 00	30	None
1914	585,364,297	3 95	30	None
1915	598,111,900	3 91	30	None
1916	672,995,447	3 91	32	None
1917	731,470,879	3 91	36	5
1918	767,758,406	3 98	48	5

\* Last year before rehabilitation under Stotesbury-Mitten management.

**Fares:** Lowered from 4 1/3 cents per passenger through additional free transfer privileges, resulting in a total saving of \$7,941,983 to the car rider. The increase to 3.98 cents per passenger in 1918 was caused by lesser use of free transfers by free-spending workers.

**Wages:** Increased to 43 cents per hour, July, 1918; thereafter voluntarily increased to 48 cents per hour by agreement with War Labor Board. Increases for trainmen alone were \$7,692,844 in excess of wage scale effective following 1910 strike.

FINANCIAL STATISTICS OF PHILADELPHIA RAPID TRANSIT COMPANY DURING 1910-1918

Calendar Year	Gross Earnings	Fixed Charges		Net Income
		Amount	Per Cent	
1910*	\$19,232,622	\$8,717,009	45 32	\$11,222,735
1911	22,147,974	8,842,771	30 93	1560,707
1912	23,282,408	9,032,948	38 80	72,542
1913	24,240,382	9,447,080	38 97	538,496
1914	23,961,408	9,698,125	40 47	201,340
1915	24,315,455	9,792,306	40 27	384,501
1916	27,279,516	9,785,653	35 87	2,377,552
1917	29,726,926	9,745,703	32 79	2,863,684
1918	31,704,427	9,800,039	30 91	1,554,616

\* Last year before rehabilitation under Stotesbury-Mitten management.

† Deficit.

**Dividends:** None paid to P. R. T. stockholders until October, 1916. This stock is now on a 5 per cent basis. The total return of \$3,597,578 so far received by P. R. T. stockholders represents less than 1 per cent per annum on their \$30,000,000 from the dates upon which it was actually paid in.

**Gross Earnings:** Have greatly increased over expectations. These large increases were due in part to quickened service and the introduction of new cars, of which 1825 have been secured.

**Fixed Charges:** Required 45.32 per cent of gross earnings in 1910 to meet the rentals and interest account, and this condition left no equity whatever to P. R. T. stockholders. But 30.91 per cent of gross for rentals and interest account (as now) leaves P. R. T. stockholders with a substantial equity in the property.

**Net Income:** The sum of \$4,482,119 was earned in excess of P. R. T. dividends paid. Co-operative efficiency lessened the number of accidents, thus reducing liability costs from 6.08 per cent to 3.47 per cent of gross earnings. This item alone saved \$5,392,054.

### Suspension Followed by Receivership

The Ohio River Electric Railway & Power Company, Pomeroy, Ohio, was placed in the hands of Harry Hartwell as receiver by the United States District Court at Columbus on Feb. 25. The proceeding was brought by the Columbia Avenue Trust Company, Philadelphia, trustee for the bondholders, to enforce payment of interest on the bonds, already defaulted.

The property has been suffering from the rising costs of operation without compensation through much needed increased revenues. Applications have been before the local councils for relief since Nov. 1, but the company has been unable to secure what is absolutely essential. The main difficulty lies in the fact that the company is obliged to deal with two municipalities at the same time. There is keen business rivalry between the places, and no co-operative spirit.

In November, 1917, increases in wages of 7 cents an hour were granted to the motormen and conductors, making the platform rates 30 cents to 35 cents an hour. On Oct. 24, 1918, the motormen and conductors were granted a further increase by a board of arbitration and effective Sept. 1 the following rates became operative: First three months, 33 cents; next nine months, 41 cents; after one year, 43 cents.

In November, 1917, the company was granted increased fares from 5 cents to 7 cents with four tickets for 25 cents, but in November last this rate was repealed by referendum vote and fare reverted to the rates in force when the road was put in operation nineteen years ago.

On Feb. 5 the company notified its men that it could no longer continue to pay the prevailing rates of wages and the men promptly struck. The road has not been in operation since that date. The receivership is the culmination of all these tragic occurrences. In all probability the road will not resume operation until some real settlement of the rate question is made.

### Louisville Dividend Doubtful

Stockholders at Annual Meeting Are Told That Outlook Shows Lower Net for 1919

Stockholders of the Louisville (Ky.) Railway need expect no dividends in 1919, because the company's operating expenses will be increased and the operating earnings reduced. Such is the tenor of the annual report of President T. J. Minary submitted to the stockholders of the company at the recent annual meeting.

The company's gross operating revenues for the calendar year 1918 totaled \$4,327,211 and its operating expenses, fixed charges and preferred dividends were \$4,072,447. Thus there remained a margin of \$254,764, of which \$249,708 was paid out in common stock dividends, the balance being applied to discount on notes sold. The full statement of income of the company for the year ended Dec. 31, 1918, is shown in the accompanying table.

EARNINGS OF LOUISVILLE RAILWAY FOR CALENDAR YEAR 1918

Transportation revenue (city lines) .....	\$3,556,031
Transportation revenue (interurban lines) .....	600,480
Revenue from mail, advertising, trackage and power (city lines) .....	151,658
Revenue from mail, advertising, trackage and power (interurban lines) .....	15,284
Other revenue (interest) .....	3,758
<b>Gross income .....</b>	<b>\$4,327,211</b>
Operating expenses (city lines) .....	\$2,383,971
Operating expenses (interurban lines) .....	499,150
Federal, State, county and city tax for twelve months (city lines) .....	355,369
Federal, State, county and city tax for twelve months (interurban lines) .....	31,957
Interest on debt, paid and accrued .....	627,000
Dividend on preferred stock, 5 per cent .....	175,000
<b>Total expenses and charges .....</b>	<b>\$4,072,447</b>
<b>Net income .....</b>	<b>\$254,764</b>
Dividends on common stock .....	\$249,708
Discount on notes sold .....	5,056
<b>Total .....</b>	<b>\$254,764</b>

The foregoing figure for operating expenses, it is said, contains a sufficient sum to pay back wages due under the award of the War Labor Board up to Dec. 31, 1918. These increased wages, however, are only from Aug. 16, 1918, so that their full effect upon net income will not be shown until the annual report of the company for 1919.

It is impossible, it is stated, to say what will be the earnings of the company for 1919, or how far they will be affected by the reduction of the number of soldiers occupying Camp Zachary Taylor. It is also impossible to say what will be the operating expenses for 1919. That the operating earnings will be reduced and the operating expenses will increase, due to the award of the War Labor Board, is, however, obvious, in the opinion of the company as expressed to the stockholders.

# Financial News Notes

**Charleston May Issue Common Stock.**—The Charleston Consolidated Railway & Lighting Company, Charleston, S. C., is reported to be considering an increase in its common stock by \$1,500,000, the proceeds to provide for extensive improvements recently made and now being installed.

**Headquarters Removed to New Orleans.**—General headquarters of the American Cities Company are to be transferred from New York City to New Orleans, La., in the near future. The executive committee is now composed of J. K. Newman, chairman; Leo Benoist, Crawford H. Ellis, Frank B. Hayne, Arsene Perrillat and Lynn H. Dinkins, New Orleans, and Francis T. Homer, New York.

**City Insists Upon Payment.**—The Pittsburgh (Pa.) Railways must make provisions to pay for street repair work, the cost of which is estimated at more than \$900,000, before it pays any more fixed charges, counsel for the city argued in an answer to a petition for payment of \$152,825 in charges, filed with the Federal Court. Failure to meet this obligation might result in forfeiture of franchise, the city intimates.

**New Member of Finance Committee.**—J. J. Spalding, a lawyer of Atlanta, was elected to membership on the finance committee of the board of directors of the Georgia Railway & Power Company, Atlanta, Ga., at the annual meeting on Jan. 28. Mr. Spalding succeeds E. G. Stevenson, Detroit, Mich., who resigned. There was no other change among the personnel of the company's directors, committee members or officers.

**Will Resume Temporarily.**—The Washington Water Power Company, Spokane, Wash., has acceded to the demands of the City Commissioners that none of its electric railway lines be abandoned and the city's threatened suit in the Superior Court to enforce its demand for restoration has been

withdrawn. D. L. Huntington, president of the company, who appeared before the City Council, verbally agreed to resume the asked-for service, but stated that the company made no promises for the future and it might later abandon such of its lines as it should see fit to do.

**Would Charge Off Loss.**—Application was made on Feb. 27 to the State Board of Public Utility Commissioners of New Jersey by the Morris County Traction Company to distribute over a period of years a loss suffered through the sale of its power plants at Dover and Chatham. The company at one time manufactured its power, but for some time past it has been purchasing electric energy. Two years ago it obtained permission to sell the power plants. It now desires to distribute this loss over twenty-nine years, the period during which a mortgage on the property still has to run. The commission has reserved decision.

**Committee Against Akron Increase.**—The railway committee of the Council of Canton, Ohio, has reported against an increase in fare to the Northern Ohio Traction & Light Company, with headquarters at Akron. When the question of municipal ownership was brought up A. C. Blinn, general manager of the company, said that the company was ready to sell. The report stated that since the company had rejected the proposal of the city made on Jan. 31, whereby the company was offered an increase if it made improvements to the lines at an estimated cost of \$45,000, the committee was opposed to granting any increase in fare on the city lines.

**Seattle Sells Bonds.**—The city of Seattle, Wash., on Feb. 25 sold two utility bond issues totalling \$1,150,000, to R. M. Grant Company, Chicago, Ill., and Oscar P. Dix & Company, Seattle, Wash. Both issues had been advertised earlier, but no bids were received. The issues covered \$400,000 of municipal railway bonds and \$750,000 of city light and power bonds, both sold on a 5 per cent basis, to admit of discount. The railway bonds are for the completion of the elevated railway and to pay for new cars recently purchased by the city. The issue also includes \$37,500 to pay for condemnation awards on the elevated. The original \$350,000 bond issue for the municipal elevated has been exhausted.

**Foreclosure Sale March 12.**—The property of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., will be sold on March 12 in Rochester to the highest bidder. This sale comes from a judgment of foreclosure entered by the Lincoln Trust Company, New York, for itself and other holders of the \$2,799,000 in first mortgage bonds. Indications are that the bondholders will take the road over themselves. The road has been in the hands of the following receivers for several years: Milford W. Childs, Medina; John M. Campbell, formerly of Rochester, and Frank A. Dudley, Niagara Falls. The plan worked out for the reorganization of the company was reviewed in the ELECTRIC RAILWAY JOURNAL for Feb. 22, page 380.

**Will Reduce Authorized Preferred Stock.**—The stockholders of the Tennessee Railway, Light & Power Company, Chattanooga, Tenn., at the annual meeting to be held on April 1, will vote on a proposal to reduce the authorized amount of preferred stock from \$50,000,000 to \$10,250,000, the actual amount now outstanding. This reduction is expected to effect a material saving in taxes, according to an official of the company. Under the laws of Maine, where the company was incorporated, corporations are taxed on the amount of stock authorized. As the company does not contemplate increasing the amount of preferred stock outstanding, it was deemed advisable by officials to bring the figure down to the amount of preferred stock now actually outstanding.

**\$3,000,000 of Notes Approved.**—The Massachusetts Public Service Commission has approved the petition of the Boston Elevated Railway for permission to issue \$3,000,000 face value of notes or negotiable coupon bonds payable in a period not exceeding seven years and bearing interest not exceeding 7 per cent. The funds to be raised in this manner are to provide means for paying for construction and equipment and for funding floating debt and for the payment of the current debts of the company. The commission has also approved the petition of the company for the authority to spend for other capital accounts the unexpended balance received from a sale of bonds amounting to \$132,147, approved by the Public Service Commission in November, 1915.

## Electric Railway Monthly Earnings

FEDERAL LIGHT & TRACTION COMPANY, NEW YORK, N. Y.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov., '18	\$306,291	\$200,645	\$105,646	\$51,707	\$53,939
1m., Nov., '17	268,643	186,536	82,107	50,267	31,840
11m., Nov., '18	3,159,671	*2,228,955	930,716	559,636	370,880
11m., Nov., '17	2,559,445	*1,798,210	761,235	543,485	217,750

LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO

1m., Dec., '18	\$200,636	*\$149,977	\$50,659	\$35,832	\$14,827
1m., Dec., '17	167,571	*107,350	60,221	39,336	20,885
12m., Dec., '18	2,189,324	*1,593,083	596,241	452,861	163,880
12m., Dec., '17	1,786,011	*1,210,690	575,321	421,933	153,988

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., Jan., '19	\$874,584	\$664,819	\$209,765	\$162,179	\$47,586
1m., Jan., '18	841,724	662,165	179,559	160,515	19,044

\* Includes taxes. † Deficit.

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '18	\$41,730	*\$31,688	\$10,042	\$16,096	\$16,054
1m., Dec., '17	42,943	*29,133	13,810	11,565	2,245
12m., Dec., '18	559,107	*\$371,394	187,713	181,966	152,649
12m., Dec., '17	339,107	*\$39,045	300,062	240,038	60,224

AURORA, ELGIN & CHICAGO RAILROAD, AURORA, ILL.

1m., Jan., '19	\$186,653	*\$168,875	\$17,778	\$38,799	\$121,021
1m., Jan., '18	129,900	*148,608	(18,708)	35,651	\$54,359

CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m., Jan., '19	\$1,853,598	\$61,727	\$1,791,871	\$108,003	\$1,683,868
1m., Jan., '18	2,031,462	30,971	2,000,491	205	2,000,286
12m., Jan., '19	22,102,803	\$53,242	21,549,561	380,377	21,169,584
12m., Jan., '18	19,429,505	366,471	19,063,034	2,770	19,060,264

# Traffic and Transportation

## Jersey Decision Affirmed

Highest Court Sustains Right of Commission to Fix Fares Sufficient Only to Prevent Deficit

The New Jersey Court of Errors and Appeals, by a vote of nine to three, on March 3 handed down a decision affirming the decision of the Supreme Court in the fare increase cases. As a result of the decision the right of the Public Service Railway, Newark, to charge 7 cents and 1 cent for an initial transfer is affirmed. At the same time the Trenton & Mercer County Traction Corporation's right to charge a 6-cent fare and to abolish the sale of the six-for-a-quarter tickets on its lines in the city of Trenton is also affirmed.

### THREE JUDGES DISSENT

The opinion was written by Justice Bergen. Those who concurred in the findings were Chief Justice Gummere, Justices Trenchard, Parker and Minturn, and Judges Heppenheimer, Williams, Taylor and Gardner. Those who dissented were Chancellor Walker, Justice Black and Judge White.

Rebate slips for the return of the excess fare over 5 cents given by the two companies to the public will now be valueless in view of the decision of the highest court in the State. The main contention against the increase was that the Board of Public Utility Commissioners did not take evidence on the valuation of the Public Service Railway property on which to base a rate, and that in the Trenton case the commission accepted the company's own appraisal.

### MAJORITY OPINION QUOTED

In filing an opinion covering the three cases, two of the Public Service Railway and one of the Trenton & Mercer County Traction Corporation, Justice Bergen said:

The Board of Public Utility Commissioners in New Jersey is not required by the statute conferring its powers to in all cases making an appraisal and valuation of the property of a trolley company in order to ascertain what increase in the rates to be charged for transporting passengers is reasonable to provide a sufficient revenue to meet the increased cost of operation due to the enhanced cost of labor, material and governmental imposition of taxes to meet the cost of the war with Germany.

Where the increase made in the rate over what was formerly a reasonable charge, is only sufficient to prevent a deficit in operation, no useful purpose can be served by a valuation of all the property of a public utility company, and it is not a pre-requisite when the statute does not require it.

The concise question presented is: Has the Board of Public Utility Commissioners the power to increase the rate to be charged for transportation service in order to produce a sufficient additional income to meet increased expense in operation growing out of the great advance in the cost of labor and material, principally due to the conditions incident to our war with Germany, and if so was such power lawfully exercised?

Assuming that the rate of 5 cents existing prior to the new conditions was a reasonable one, then the application of ordinary common sense will unhesitatingly lead every fair-minded person to the conclusion that it would not continue to remain reasonable if the cost of production so advances as to destroy the basis upon which it was rested. The solution of such a proposition does not require the aid of legal learning; it is a question of economics which any one of ordinary intelligence can apply.

On a question of whether the commission could properly fix a rate without having evidence before it of the value of the utility company's property, the opinion says:

We are of the opinion that under the facts shown in this case a valuation is not required by law; that the board exercised a reasonable discretion within the legislative powers delegated to it and that no more is exacted from the public than the services rendered are reasonably worth it, if they are to be sufficiently served, or perhaps served at all. The judgments appealed from will be affirmed with costs.

## Six Cents for Warren Upheld

In the case of the borough of Warren versus the Warren (Pa.) Street Railway, the Public Service Commission of Pennsylvania has held that the proposed increase in fares is just and reasonable so long as the present conditions obtain. The commission has therefore dismissed the complaint without prejudice to its renewal any time within one year.

The complaint was against an increase in fares by the railway and presented two questions: (1) the authority of the commission over rates fixed by a franchise ordinance; and (2) that the proposed rates were unjust and unreasonable. In its finding the commission says that its authority to control rates fixed by franchise or ordinance was fixed in the case of the Borough of Wilkensburg versus the Pittsburgh Railways (Complaint Docket No. 1883). The commission holds that where, from all the evidenced adduced, it clearly appears that the net revenue under the proposed rates would be insufficient to provide for the payment of interest on funded debt, obligations for street paving, renewals, depreciation and dividends, there is no need for the commission to find a fair value of all the respondent's property for a rate base.

The Warren Street Railway filed with the Public Service Commission and posted in its office in the Borough of Warren under date of July 27, 1918, to become effective on Sept. 1, 1918, a tariff (1) increasing the 3-cent tickets, which sold in strips of five, to 5 cents per ticket; (2) providing for the sale of books containing thirty-five tickets for \$2, good on city cars only and for the individual purchaser; (3) increasing the single fare on all city cars from 5 cents to 6 cents to any point within the borough.

## West Chester to Zone

Commission in Suburban New York Asks Commission to Approve Ten Five-Cent Zones

The Westchester Street Railroad, White Plains, N. Y., on Feb. 27, filed with the Public Service Commission for the Second District, a petition asking to put into effect a new zone system under which it will receive increased revenue. Accompanying the petition by the company were certified resolutions by Scarsdale, White Plains and Mamaroneck and the towns of Greenburgh and Mamaroneck, approving the company's plan. Immediate action will be taken by the commission.

### TEN FIVE-CENT ZONES PLANNED

The new plan provides for ten fare zones, each calling for a 5-cent fare. In urging favorable action by the commission the company says that for the year ended Dec. 31, 1917, its operating deficit was \$36,456 and for the past year \$14,712, and that the corporate deficit on Dec. 31, 1918, was \$91,552 and that the corporate deficit from June 30, 1913, to Dec. 31, 1918, averaged \$50,067 a year.

The company explains the apparent gain in operating deficit in 1918 or 1917 principally by the adjustment of depreciation charges and an abnormally heavy charge for injuries and damages as against a normal charge in 1918. Deficits during the past two years have been due to increase in wages and materials and the company believes these conditions will continue for some time and the estimated deficit for 1919 will be greater than in 1918, the company says, unless relief is secured.

Fare rates were increased in 1918 from 5 cents to 7 cents except from Tarrytown to White Plains, Mount Vernon and the town of Eastchester, but the company says the increases have not been sufficient to meet continuing deficits and consents have been obtained for further increased rates through a new zoning plan.

### CHANGE WANTED FOR LIMITED PERIOD

The commission has been asked to approve the fares specified in the first, second, third, fourth, fifth, eighth, ninth and tenth zones. The company operates in the sixth and seventh zones under a contract with the Westchester Electric Railroad and approval of fares in these zones will be asked through that company. The present application is not for a permanent modification of the rate or a permanent rezoning, but for a limited period as indicated in the consents secured from the different municipalities.

The company operates about 30 miles of electric railway in Mount Vernon, Tarrytown, Mamaroneck, Silver Lake, Rosedale, Elmsford, Tuckahoe, Bronxville, White Plains and Scarsdale. It leases and operates the Shore Line Electric Railroad, White Plains, and in turn is controlled by the New York, New Haven & Hartford. It purchases energy from the New York Central.

## Measure for Measure in Rochester

Has a Commission with No Authority Over Fares the Right to Require Greater Service Than Traffic Will Support?

The appraised valuation of the New York State Railways, according to evidence given on Feb. 26 before the Public Service Commission for the Second District of New York, is \$53,326,235.

The valuation as given was brought out at a hearing on an order to show cause over service by the New York State Railways in Rochester. The company made the claim that the commission could not order service inasmuch as it has no power to increase fares and that if the commission has the right to order service without increased rates its action is confiscatory of the company's property.

The valuation of the company's property was by G. H. Paine, Chicago. It was made by the company for use in its 6-cent fare application. The total valuation of \$53,326,235 Mr. Paine divided between the Rochester lines, \$26,176,209, and the Syracuse, Utica and Oneida lines, \$27,150,025.

Valuation of the Rochester lines included separate valuations as follows: Rochester city line, one-fare zone, \$17,850,661; Rochester Electric Railroad, leased, \$838,806; Summerville line, \$586,136; Sea Breeze line, \$677,234; Durand & Eastman Park, \$57,875; Rochester & Sodus Bay, \$2,996,253; Rochester & Eastern, \$3,839,596; Ontario Light & Traction Company, \$171,603. These valuations included the valuation of all tangible and intangible property, the cost of financing, value as a going concern and working cash capital required. The total of the tangible and intangible property of the Rochester lines was \$21,731,448.

This valuation was made in 1917 and Mr. Paine explained the observed depreciation totaling \$3,820,547 on the entire New York State Railways of which \$1,641,114 is on the Rochester city lines, including \$1,317,850 on the city fare zone, \$49,249 on the Rochester electric line, \$28,119 on the Summerville line, \$27,601 on the Sea Breeze line, \$1,755 on the Durand and Eastman Park, \$93,567 on the Rochester & Sodus, \$109,567 on the Rochester & Eastern, and \$14,390 Ontario Light & Traction Company. The depreciation figures, Mr. Paine said, were not the result of an actual examination of the companies' properties, but from general observation. The valuation he considered a fair one by averaging the prices of the high and the low years. Mr. Paine was questioned closely as to the manner employed in making his computations, the results in half a dozen large volumes being submitted in the evidence.

Corporation Counsel Cunningham, for the city, wanted to know the scope of the investigation. He wanted time to file an answer. He said he was not prepared to cross-examine Mr. Paine and that if he did go into a cross-examination it would be necessary to

employ an expert and perhaps examine the company's property.

Commissioner Barhite, who presided at the hearing, said the proceeding was in a determination of service in Rochester. The company says it cannot give better service without more revenue and the commission must have the record of the company's financial condition before it can pass on the question if it decides to do so. The railroad and the city, he said, should make the record. The commissioner said he could not tell Mr. Cunningham just what the commission was going to do.

J. M. Joel, auditor of the company, submitted a series of financial statements. They showed that for the year 1918 the operating income of the Rochester lines, without deductions other than taxes, amounted to \$193,569.

After deducting taxes and operating expenses, deficits on lines were given as follows:

Charlotte line, \$31,989; Summerville, \$12,270; Sea Breeze, \$4,478; Rochester and Eastern, \$16,771; Rochester & Sodus Bay, \$61,261; and Glen Haven, \$269. Mr. Joel was examined by Mr. Cunningham with the understanding that certain detail figures are to be furnished the city.

Harris, Beach, Harris & Matson represented the railroad. Supervisor Louis Lubelbeiss of Irondequoit was also called as a witness.

Mr. Beach said the company would have some additional evidence to submit, but the hearing was practically concluded except for the cross-examination by Mr. Cunningham. Mr. Cunningham said he wanted an expert to go over the evidence and the financial statements before he continued his examination.

It was agreed to adjourn until March 19 at Albany.

## State Conference in Washington

City Authorities, Commission Officials and Railway Representatives Canvass Entire Railway Situation for a Solution

An informal conference was held in Tacoma, Wash., on Feb. 28 between members of the Public Service Commission and various city and electric railway officials of the State. Practically every community in which there is a railway was represented. City officials of Tacoma, Spokane, Bellingham and Seattle were there, and officials of the railway interests in these and other communities presented their case to the commission.

### FIVE-CENT LIMITATION REMOVED

The conference was called following the passage of a law by the Legislature now in session removing the statutory 5-cent fare limitation. The commission decided upon this after receiving an application from the Washington Water Power Company, Spokane, for permission to charge a 7-cent fare with 1 cent for transfers. The conference was not held for the purpose of considering the Spokane application, but to obtain a general view of the electric railway situation, and to learn the needs of the various communities as well as their desires.

Last July the city of Tacoma, confronted by an intolerable transportation situation, decided to investigate electric railway conditions in that city. In order to assist the officials in an advisory capacity a citizens' committee of twenty-five representatives in its personnel, was appointed to carry on the investigation. That committee has not yet finished its work, but sensing the seriousness of the situation it recommended to the Council last August that relief be granted the Tacoma Railway & Power Company. The Council acted and granted a 7-cent fare as an emergency measure pending the completion of its work by the committee.

The chairman of the citizens' committee, Scott Henderson, reviewed for the conference the results of the work done in considering the Tacoma situation. He frankly confessed that it was a huge task and that he did not know, the city officials did not know and no one knew just what could or would be done even after the long period of study of the problem.

Increased wages granted by the company, he said, and other increased costs had exceeded the increased revenues from the increased fares, leaving the company a little behind where it was before the new fare went into operation. As a matter of fact the company is \$82,000 farther behind after twenty-eight weeks under the 7-cent fare than it was at the end of the six months preceding that period.

The gross earnings increased \$193,728 during the last six months of 1918, which was largely a 7-cent fare period, over the first six months of the same year, but in that same period wages increased \$217,402 and other operating expenses increased \$51,729, a total of \$269,132. In other words the 7-cent fare increased gross earnings 30.5 per cent, but labor costs increased 73.1 per cent.

### MANY SUGGESTIONS, BUT NO REMEDY

As Tacoma was the actual experimental community in the fare increase the results were made very largely the subject matter of the discussion, and while no one had a real remedy there were many suggestions for relief. As Mr. Henderson put it, the fare increase seemed to be only a shot in the arm administered to revive an expiring patient. He said that some scientific course of treatment would have to follow to restore the sick man of

the public utility world to normal vigor. The suggestions ranged from municipal ownership to 8-cent fares together with transfer charges and relief from franchise burdens. The analysis to which all suggestions were subjected merely showed the impracticability of most of them, but it served to emphasize the need for immediate relief if urban transportation is to remain ade-

quate to the requirements of the community.

Naturally each of the systems represented had its own peculiar problems, but all had a common ailment—insufficient revenues with which to meet the increased wage and other operating expenses. The demonstration of this fact seemed to be the only tangible result of the conference.

## Bay State Trial Fares Approved

### Supreme Court Refuses Argument of Receiver that Commission Fares Will Result in Confiscation

The Massachusetts Supreme Court on Mar. 3 sustained the Public Service Commission in its decision against the institution of a minimum 10-cent fare on the Bay State Street Railway. It will be recalled that in October, 1918, the receiver filed with the commission a schedule establishing enlarged city zones with a uniform cash fare of 10 cents and dividing the country lines into zones about 2 miles long with a minimum cash fare of 10 cents good for two zones, and 5 cents for each additional zone.

The commission refused approval of such rates and substituted for a short trial period a schedule of its own making, as reviewed in the *ELECTRIC RAILWAY JOURNAL* of Dec. 21, 1918. The commission, in brief, proposed a 7-cent ticket fare or a 10-cent cash fare for the combined outer and inner zones in cities, and a 5-cent fare for a 2-mile zone on the country lines, with the option to the company of a 5-cent cash fare or a 7-cent ticket fare for a single zone. These fares were to be tried for two months and with favorable results for another similar period. In the case of no gain in revenue, the commission said it would not further oppose the company's schedule. The receiver, however, appealed to the court on the ground that he was being obliged to charge confiscatory rates.

The Supreme Court now says that whether the rates of fare as presented in the schedule of the receiver be lowered or raised, cogent arguments might be advanced that the revenue likely to be raised thereby would be less than that which would be realized from the schedule of the receiver.

The court, however, also points out that the commission's purpose appears to be to deal fairly with the company, while at the same time having due regard for the interests of the public. Comparative revenue likely to be derived under the two schedules is largely a matter of prophecy. There appears to be good ground for the belief that the commission's plan will be as profitable as that set forth in the receiver's schedule. It cannot be proved that it will produce less additional revenue.

The situation, the court said, seems to bring the present case within the category of cases where the evidence as to the probable result of the rates in controversy would show that they

were so nearly adequate, that is, so nearly equivalent to the amount likely to be realized from the schedules proposed by the receiver, that nothing but a practical test could satisfy the doubt as to their sufficiency.

Furthermore, the period of time for experimentation proposed by the commission (being not over four months in the aggregate and possibly not over two months) in order to determine by actual experience whether its rates yield as much as the estimates of those proposed by the receiver cannot be said to be excessive.

#### Continuing the court says:

Where by all parties in interest the times are recognized as abnormal and the particular period as one of transition so that both the receiver of the railway and the public service commissioners by their words and acts agree that any substantial return upon the capital honestly and prudently invested must, even under wisely economical management, be suspended temporarily and that any rates established at the moment are likely to be impermanent and experimental, the public service commissioners are not, under the constitution of Massachusetts or that of the United States, deprived of power to modify the schedule of rates, fares and charges proposed by the receiver. The public service commission may make such changes therein as in its judgment are required by the public interests and the rights of the owners of invested capital, when the revenue to be derived therefrom is not thereby substantially diminished below that likely to be derived from the rates proposed by the receiver.

The rate-making power established by legislative authority is not stripped of all functions because extraordinary conditions have sprung into existence, which the owners of the privately-owned property recognize as preventing them from deriving any income for the time being from the property, but it ceases as soon as its judgment for the protection of the public interests when it does not reduce substantially the revenue proposed to be exacted from the public by the owners of the public utility. Simply because such owners are for the moment failing to receive the just compensation to which they are long perspective they are entitled, they are not thereby necessarily at liberty to fix their own terms. Their property is still affected with a public interest.

The result here reached appears to us in harmony with the decisions, to which reference has been made, and is fairly deducible from them. We perceive nothing at variance with it in *Lake Shore & Michigan Southern Railway vs. Smith* (17 U. S. 684) much relied on by the receiver, as modified by *Pennsylvania Railroad vs. Towler* (245 U. S. 6, 17) or in *Denver vs. Denver Union Water Company* (46 U. S. 178) and *Detroit United Railway vs. Detroit* (244 U. S. —).

We do not find it necessary to discuss whether circumstances may arise where the public service commissioners may be warranted even under circumstances such as here disclosed, in establishing rates likely to yield a revenue less than that which would be derived from those proposed by the receiver, or less than a fair interest on capital honestly and prudently invested. The present decision is confined to the facts discussed in this record.

## A Peculiar Case

### Des Moines Railway Commissioner Dismissed for Approving Service Changes

Roy G. Smock, city supervisor of the Des Moines (Iowa) City Railway, was summarily discharged by the City Council on Feb. 26, two days before his resignation was to have taken effect. Mr. Smock's dismissal was by unanimous vote of the Council. It resulted from his having approved the reduction in service proposed by the Des Moines City Railway. Members of the Council felt that Mr. Smock should have withheld action on the cut, leaving it for his successor. His resignation was tendered a month ago.

The new schedule announced by the railway is about a 10 per cent cut in service. It is not as drastic as was forecasted by officials of the company when the application for an increased fare was rejected by Federal Judge Martin J. Wade. The owl car service was not abandoned as at first announced and rush-hour service is not cut. The main reduction is in the non-rush hours with intervals of two or three minutes longer between cars in the morning and afternoon. During the non-rush hours fifty-six cars will be in operation and at the peak load there will be 116.

Mr. Smock in announcing his approval of the service cut issued a statement to the effect that after making a careful study of the earnings of the railway he was satisfied that it could not give the service formerly provided and that he felt he was justified by Judge Wade's rulings in approving the reduction.

Scott Goodrell, who was named as Mr. Smock's successor a month ago, was ordered to report for service immediately after the Council had dismissed Mr. Smock.

The service reduction was scheduled to go into effect on Feb. 27, but a midnight decision on injunction proceedings brought by city attorneys held it up and the case is now on trial before Judge Hubert Utterback of the Polk County District Court. Hearing of evidence on the permanent injunction closed on March 1. Judge Utterback announced that he would render his decision on March 4.

## More Time to File Zone Plan

Granting the request of L. D. H. Gilmour, general solicitor of the Public Service Corporation of New Jersey, Newark, N. J., the Board of Public Utility Commissioners on March 4 extended until March 11, the time for the corporation to file its report on a new zoning system, to be used by the Public Service Railway. Under an order of the board the corporation was directed to file the report on March 1, but Mr. Gilmour informed the commission that the report was in the hands of the printer and that it would be impossible to have it completed before March 11.

## Transportation News Notes

**P.-A.-Y.-E. and Tokens in Springfield.**—The Springfield (Ill.) Consolidated Railway is installing Johnson fare boxes on all of its cars and adopting the pay-as-you-enter method of fare collection together with metal tokens.

**Increase for Jennings Line.**—The Public Service Commission of Missouri has authorized the St. Louis & Jennings Railway, St. Louis, Mo., to increase its fare from 2 to 5 cents for adults and from 1 to 2 cents for children. The commission has ordered the company to sell seven adult tickets for 25 cents, thirty for \$1 and 100 tickets for \$3. The company operates only 2½ miles of line.

**Increased Fare Needed.**—At the annual meeting at Findlay, Ohio, on Feb. 26, B. L. Kilgour, President of the Toledo, Bowling Green & Southern Railway, told the board of directors that increased revenue will be necessary in order that the road may render proper service to the public. The company has asked for an increase in rates at Bowling Green, North Baltimore, Maumee and Portage.

**Elevated Fare Demurrer Sustained.**—Circuit Court Judge Baldwin on Feb. 28 sustained a demurrer filed by the Chicago (Ill.) Elevated Railways to State Attorney Hoynes's amended petition asking for an injunction against the charging of 6-cent fares on the elevated lines. The court said that it is a matter that should be passed upon by the Supreme Court. Mr. Hoynes's assistants said the case would be appealed to the Supreme Court at once.

**Motion for Dismissal in Toledo Case.**—In the case of the appeal of the city of Toledo, Ohio, against the Toledo Railways & Light Company, the company has filed a motion for dismissal in the United States Circuit Court of Appeals at Cincinnati. The appeal is from an injunction granted by the United States District Court, preventing the city from interfering with the rate of fare charged after the expiration of the company's franchises in Toledo.

**Wants Seven Cents in Spokane.**—Seven-cent fare on all railway lines in Spokane—those of the Spokane & Inland Empire Railway as well as the Washington Water Power Company—are provided for in tariffs of both companies, made public on Feb. 21. They call for an increase in fare from 5 cents to 7 cents, with a 1-cent charge for transfers. If no objection is offered to the tariff the Public Service Commission may order the increase without calling a hearing.

**Fare Changes Wanted by Patrons.**—William S. Stearns, attorney for the Town Board of Pomfret, Chataouqua County, has filed with the Public Service Commission for the Second District, a complaint accompanying petitions signed by patrons of the Buffalo & Lake Erie Traction Company between Dunkirk and Fredonia, asking the restoration of certain commutation rates, the issuance of transfers and better service in Dunkirk, Fredonia and the town of Pomfret.

**Orders Old Fare Restored.**—The Corporation Commission of Oklahoma has issued an order directing the Pittsburgh County Railway, which operates in McAlester and from McAlester to the Oklahoma State Penitentiary, to restore a 5-cent fare from the city to the State Penitentiary. The railway recently arbitrarily increased the fare from the city to the State Prison to 10 cents and the matter was referred to the Corporation Commission by S. W. Morley, warden of the penitentiary, who asked that the 5-cent fare be restored.

**Agrees to Trial of One-Man Cars.**—Operation of one-man cars was defeated by unanimous vote of the City Council of Norfolk, Va., at its regular meeting recently. Following the vote on the proposition a resolution was adopted instructing the city clerk to notify the United States Housing Corporation of the action taken by the Council and informing the corporation that the Council is prepared to consider any proposition looking to a try out of the cars in Norfolk which will in no way obligate the city or involve the city in any legal complication.

**Complains About Round-Trip Fare.**—The New York State Railways, Utica Lines, in its answer to the complaint against the 27-cent round-trip fare between Clinton and Utica, filed with the Public Service Commission for the Second District, alleges that continuance of a 25-cent round-trip fare would constitute an unlawful discrimination as between the company's patrons in Utica and New Hartford and its Clinton patrons, and that this discrimination was never intended when the railroad's predecessor was granted a franchise. The commission will at once direct a hearing.

**Fare Case in Company's Favor.**—Judge Duval West in the United States District Court in San Antonio, Tex., has handed down a decision holding that the franchise ordinance under which the San Antonio Public Service Company operates its cars does not constitute a binding contract in so far as the 5-cent-fare provision is concerned. Application was made by the company to the City Commission in August to charge a 6-cent fare. The appeal was denied in October. In November the company asked for a hearing. This plea was also rejected by the City Commission.

**Would Make It Easy for Jitneys.**—Senator Henry E. Ackerman of Mon-

mouth County, N. J., has introduced a bill in the New Jersey Legislature providing for the elimination of the bonding feature of the jitney law in municipalities of less than 20,000 people. The Senator says the bill is intended to meet the situation in Long Branch where the local electric railway does not operate in one end of the city and the residents depend entirely upon the jitneys. The bonding companies increased the premium considerably over \$300. The bill does not interfere with the franchise tax or the license fee.

**Handled Big Crowd Easily.**—The two big shows the last part of February—the Auto and the Tractor—materially increased business for the Kansas City (Mo.) Railways. Not only did that company take care of the increased traffic of home people who desired "to come down town and see the show," but it also handled the thousands of visitors satisfactorily. It is estimated that more than 100,000 people came to the city from Missouri and other States to attend the shows. The week's big business showed that the railway is again as able to handle extraordinary demands as ever it was before the recent strike.

**Aiding in Civic Betterment.**—The Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., is aiding the movement for civic growth of the city of South Bend and has contributed generously to publicity space in South Bend newspapers announcing its co-operation in all matters tending to increase the importance of the city in a business, commercial and civic way. The company shows excellent pictures of its freight and passenger stations, urges travel by interurban railway and the use of the interurban railway for freight shipments. The company is also taking a prominent part in the publicity work designed to foster Interurban Trading Day, held every Thursday.

**Open Door Policy in Birmingham.**—Under John Sparrow, recently appointed publicity agent of the Birmingham Railway, Light & Power Company, Birmingham, Ala., all inquiries addressed to the company are promptly answered either by letter or through the newspapers. The company almost daily has published news connected with its actual operation. The rule has been adopted of not announcing a betterment in service until the betterment has become effective. Announcements of the company thus have the weight of authority and the public accepts them in good faith. The records of the receiver of the company are, of course, the records of the court and are therefore open to the public. The public, however, cannot examine these records without unnecessary time and trouble. Mr. Sparrow has full access to the records and to all the operations under the receiver. He presents through the newspapers, in part as news and in part by way of advertisements, all the information in regard to the company in which the public is interested.

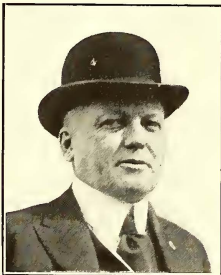
## Personal Mention

### J. F. Collins Elected

Vice-President of Michigan United Railways Made President of Central Electric Railway Association

J. F. Collins, vice-president and general manager of the Michigan United Railways, Jackson, Mich., was elected president of the Central Electric Railway Association at the annual meeting held in Cleveland, Ohio, on Feb. 27 and 28.

Mr. Collins entered railway work in 1877 as a horse-car driver for the Citizens' Street Railway, Indianapolis, Ind. He advanced step by step with this company to the position of superintendent. In 1898 Mr. Collins went to



J. F. COLLINS

Toledo, Ohio, as superintendent of the Toledo Traction Company and later became manager of railroads on the same property. He resigned in 1908 to become general manager of the Saginaw-Bay City Railway, Saginaw, Mich., a property which also furnishes electric lighting and gas service.

In 1910 Mr. Collins resigned from his general managership at Saginaw and returned to Toledo as president of the Toledo & Western Railroad, the Maumee Valley Railways & Light Company, the Toledo, Ottawa Beach & Northern Railway and assistant general manager of the Toledo Railways & Light Company. He resigned these positions in 1912 and went to Jackson, Mich., as vice-president and general manager of the Michigan United Railways and the Michigan Railway, which properties operate more than 400 miles of trolley and third-rail interurban lines in the State of Michigan. Of this mileage more than 200 miles were built under the direction of Mr. Collins since 1912.

Mr. Collins mentions with pride the fact that he has never received one dollar of salary from any other industry than the electric railway.

C. F. Phillips has been appointed freight claim agent of the Toledo & Western Railroad, Toledo, Ohio, to succeed C. C. Cash.

J. C. Ward has been appointed claim agent of the Cleveland, Willoughby & Eastern Railroad, Willoughby, Ohio, to succeed J. H. Shaw.

J. G. Merriman has been elected president of the Asheville & East Tennessee Railroad, Asheville, N. C., to succeed A. S. Guerard.

A. B. Caldwell has been appointed superintendent of the Rochester Electric Division of the Erie Railroad, to succeed J. D. Cummin.

I. C. Martin has been appointed purchasing agent of the Mansfield Public Service & Utility Company, Mansfield, Ohio, to succeed F. E. Ray.

S. C. Stivers, secretary of the Ithaca (N. Y.) Traction Company, has also been appointed treasurer of the company to succeed T. P. Clancy.

Howard Bishing has been appointed roadmaster of the Springfield & Washington Railway, South Charleston, Ohio, to succeed J. H. Lowery.

W. E. Wilson has been appointed electrical engineer of the Cleveland & Eastern Traction Company, Cleveland, Ohio, to succeed F. V. Weldy.

Clarence Wood has been appointed roadmaster of the Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio, to succeed L. J. Rider.

E. R. Wait has been appointed secretary, treasurer and auditor of the Bartlesville (Okla.) Inter-Urban Railway, to succeed L. A. Ramsey.

A. T. Mercier has been appointed superintendent of the Portland, Ore., division of the Southern Pacific Company, to succeed F. L. Burckhalter.

L. Frank Gordon has been appointed claim agent of the Portland, Ore., division of the Southern Pacific Company, to succeed A. S. Rosenbaum.

F. E. Wilkins has been appointed auditor of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, to succeed A. E. Dedrick.

Miss P. J. Kelley has been appointed general freight and passenger agent of the Empire State Railroad Corporation, Syracuse, N. Y., to succeed R. E. A. Pitman.

D. M. McLaughlan has been appointed master mechanic of the Portland, Ore., division of the Southern Pacific Company, to succeed C. E. Peck.

William Decker has been appointed master mechanic of the Orange County Traction Company, Newburgh, N. Y., operating 23 miles of line to Newburgh, Orange Lake and Walden, to succeed Edward Schulmyer.

John Harper has been appointed superintendent of transportation of the Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio, to succeed A. C. Flint.

W. H. Goodenough has been appointed master mechanic of the Mansfield Public Service & Utility Company, Mansfield, Ohio, to succeed Riley Perkins.

E. H. Hagensick has resigned as superintendent of electric lines of the Omaha & Council Bluffs Street Railway, Omaha, Neb., to become electrical engineer for the Union Pacific Railroad with headquarters at Omaha. Mr. Hagensick spent seven years in the electrical department of the Union Pacific previous to becoming connected with the electric railway company at Omaha in 1913.

W. O. Jacobi has been superintendent of the electric lines of the Omaha & Council Bluffs Street Railway, Omaha, Neb., taking the place of E. H. Hagensick, who resigned to become electrical engineer for the Union Pacific Railroad. Mr. Jacobi was connected with the Nebraska Power Company in 1905 and 1906, but returned to the Lewis Institute, Chicago, from which he was graduated in 1909. In 1910 and 1911 he was in the employ of the Pullman Company at Pullman, Ill. He entered the electrical department of the railway at Omaha in 1911.

Emil G. Schmidt, president of the Des Moines (Iowa) City Railway and the Interurban Railway, has announced that on his retirement from those organizations he will take active charge as president of the First Trust & Savings Bank, Des Moines. Mr. Schmidt has been president of the bank since its organization three years ago, but has taken no active part in its affairs. Vice-president E. B. Wilson has heretofore been in active charge of the bank. Mr. Schmidt's son, who is now in the service, will also make his home in Des Moines.

Theodore Francis Green, who has been appointed a co-receiver of the Rhode Island Company, is one of the best known and ablest attorneys in Rhode Island. He has been politically prominent for a number of years. He ran for Congress on the Democratic ticket in 1913 and was defeated, while in 1912 his campaign for Governor was also unsuccessful. He has been a federal trustee of the Rhode Island Company for nearly five years, acting as secretary of the body. His other activities were reviewed in the ELECTRIC RAILWAY JOURNAL at the time of his appointment as one of the federal trustees of the railway.

Zenas W. Bliss, former Lieutenant-Governor, who has been appointed a co-receiver of the Rhode Island Company, Providence, R. I., is one of the best known men in Rhode Island. He was born in the town of Johnston on Jan. 10, 1867, and was graduated from the Massachusetts Institute of Technology in 1889. He returned to Providence after his graduation and practiced



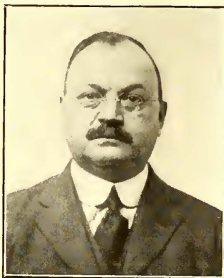
for a period as an engineer. Later he entered the real estate business. He was a member of the Cranston, R. I., Town Council from 1901 to 1909. He was a member of the House of Representatives of the Rhode Island Legislature from Cranston from 1903 to 1909. He was chosen speaker of the House in 1909 and the following year was elected Lieutenant-Governor, which office he held for two years. In 1916 Mr. Bliss received the honorary degree of A.M. from Brown University. His last public service was as a member of the State commission to investigate the affairs of the Rhode Island Company.

Col. Thornwell Mullally, assistant to the president of the United Railroads, San Francisco, Cal., who has been away for a year on leave of absence, has announced that he will not return to the position that has been held open for him with the traction company. Colonel Mullally organized and took overseas the regiment of California troops popularly known as "The Grizzlies." He is engaged at present in finding employment for his men who are being mustered out of service. In 1915 Colonel Mullally received a special invitation from General Pershing to join the Pershing column in Mexico for an indefinite period, during which he studied military field tactics and procedure at close range as a "military observer." Colonel Mullally was graduated from Yale University and the New York Law School. He devoted himself to law work in New York until 1906, when he went to San Francisco. In his position as assistant to the president of the United Railroads he rendered invaluable public service in connection with the reconstruction and reorganization of the city's transportation facilities following the fire.

John Sparrow, whose appointment as publicity agent for the Birmingham Railway, Light & Power Company, Birmingham, Ala., was noted briefly in this paper for Feb. 22, was born in Florida. He began life as a "cub" in a printing office and is still sticking to the types as head of the Sparrow Advertising Agency at Birmingham. He was a newspaper man for a number of years, holding every position on the staff from reporter to managing editor. About twenty years ago he went into the advertising and publicity business for himself. About a month before the Birmingham Railway, Light & Power Company was placed in the hands of Lee C. Bradley as receiver, Mr. Sparrow was engaged by Mr. Pevear, general manager of the company, to conduct an informative campaign. At that time the company was the victim of much misrepresentation and a consequent misunderstanding on the part of the public. Through Mr. Sparrow the company began to tell the people in a simple, straightforward way the conditions which the managers were endeavoring to overcome. When Mr. Bradley was appointed receiver he approved the open door policy which had been inaugurated by Mr. Pevear and

determined to continue it on still broader lines. He accordingly appointed Mr. Sparrow to carry on a campaign.

George H. Kelsay, formerly electrical engineer of the Union Traction Company of Indiana, has resigned his position with that company and on March 1 began his new duties as superintendent of power and equipment of the Cleveland, Southwestern & Columbus Railway. His headquarters will be at Elyria, Ohio. Mr. Kelsay was graduated from the engineering school of Purdue University in 1900. After a few weeks spent in the car shops of the Union Traction Company of Indiana he became master mechanic and electrician of the Marion (Ind.) Transit Railway and later was made superintendent. He left this company in 1902 to become master mechanic of the Western Ohio Railway, Lima, meanwhile putting in a few weeks with the Richmond Street & Interurban Railway, Richmond, Ind. During the three years spent with the Western Ohio, Mr.



G. H. KELSAY

Kelsay had supervision of electrical equipment and power lines for this 80-mile interurban railway, which used a transmission voltage of 33,000. From 1905 until Feb. 28, 1919, he was first superintendent of power and later electrical engineer for the Union Traction Company of Indiana. During this time the company grew from a system operating 200 miles of high-speed line and four city properties, with one power plant and fourteen substations, to one with 400 miles of track and five additional power plants. Under his direction the central power plant was enlarged, the transmission system was expanded, three power plants were eliminated and the number of substations was increased to twenty-eight. He has had charge of all electrical equipment in power plants and substations, transmission lines, telephone systems, track building, 75 miles of automatic signal system, electrolysis surveys, and he designed and constructed and later superintended the operation of thirty small lighting plants in the territory served by the railway.

## Obituary

Stephen Sellon, well-known as a British consulting engineer, died recently. For many years he devoted himself to tramway and light railway work, and was one of the foremost in the inception and promotion of new schemes. He figured prominently as a witness when tramway bills were before Parliament, and as a leading member of the Tramways & Light Railways Association he took a large part in negotiations with government departments on matters affecting the welfare of the industry. Along with the British Thomson-Houston Company he was responsible for the introduction of the first electric tramway on the overhead wire system in England. This began operation in Leeds in the end of 1891. He was afterward engineer for the equipment of many trolley lines belonging to the British Electric Traction Company and other companies.

Sir Rodolphe Forget, banker and former Member of Parliament for Charlevoix, died at Montreal, Que., on Feb. 20. He was 57 years old. Sir Rodolphe at an early age entered the office of Senator L. J. Forget as a clerk. In 1887 he became a partner in the firm of L. J. Forget & Company, continuing until 1907, when he severed his connection and began the banking business on his own account, which has since become one of the largest financial concerns in Canada. Sir Rodolphe was an official in the Quebec Railway Light, Heat & Power Company; Quebec & Saguenay Railway Company; the Toronto Railway; Canadian General Electric Company; St. Lawrence Flour Mills Company. He was the organizer of the Montreal Light, Heat & Power Company; the Quebec Railway Light & Power Company, and the Canada Cement Company.

Philip Henry Wynne, at one time with the Boston Elevated Railway, died on Feb. 11 at his summer home in Old Deerfield, Mass., at the age of fifty-one. He was a native of Elizabeth, N. J. His electrical experience, following a course of study at the Massachusetts Institute of Technology, included terms of employment with the Thomson-Houston Electric Company and later in the engineering department of the Boston Elevated Railway during the construction of the rapid transit system. He was a most valued assistant in tests, calculations and work of scientific precision and bore the brunt of much important electrical investigation under John Lundie, then consulting engineer of the company. Mr. Wynne engaged in the design of scientific instruments for about ten years after leaving the Boston company, being associated with the L. E. Knott Apparatus Company. Lately he gave such time as his health allowed to composing music.

# Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,

SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

## High Prices Unfavorable To Fixed List

General Electric Doubles List on Wiring Devices to Get Away From Unsatisfactory Condition

Up to the time that the prices of materials began to skyrocket it was very satisfactory to make a fixed list price, and to change discounts as market conditions warranted. Catalogs on this basis did not have to be changed every time the price changed. It was simply necessary to change the discount sheet.

Lately, however, the margin between list and net has become very small, and not infrequently the net selling price is greater than the list price. A good deal of confusion has been created, and some concerns have gone so far as to abolish the practice of quoting on a list basis and now quote on a net basis altogether.

This week an announcement was made by the General Electric Company relative to a new price schedule affecting its entire line of wiring devices, except inclosed fuses and some similar material, effective March 1, whereby all lists are doubled. The statement reads as follows:

During the active period of the war, when costs advanced very rapidly, the easiest way to accomplish each advance in prices was to reduce discounts. This resulted in a most unsatisfactory method of figuring net prices on many lines, necessitating as it did in many instances selling wiring devices on a list-plus basis. There is no indication that costs will be sufficiently reduced for some time to come to warrant the continuing of this present unsatisfactory method of pricing.

The company decided that the only way immediately to remedy this, without making present catalogs obsolete, was to declare practically all list prices doubled and establish a new schedule of discounts from these doubled lists which gives the same net prices as are now in effect.

## Another Manufacturer Adopts Rental System

Power Recorders Under Plan Become Property of Lessee's at End of Sixteen Months

Rental of electric railway equipment is not a new idea to the field although but few manufacturers have utilized this method of distribution of their product. Within the last two or three months, however, two new instances of this means of distribution have been announced, the latest being that of the Arthur Power-Saving Recorder Company, New Haven, Conn.

The rental method of the latest company to adopt this system differs somewhat from the others in that the recorder automatically becomes the property of the renting road after the lease has

run a certain definite length of time. In other words, the manufacturer in this instance finances the purchase of his product for the railway.

According to the terms of the lease the railway taking a lease pays rent for sixteen months, at the end of which time the recorder automatically becomes the property of the road. The manufacturer states that this gives him about 6 per cent on the capital advanced.

Of course should railways so desire, recorders can still be purchased outright.

## Further Price Drops

Lower Copper Quotations Bring Easier Wire and Bond Prices—Cross Arms Lower

When quotations for the sale of copper began to decrease below the 26-cent base, there were hopes among buyers of electric railway material that further drops would have an effect of lowering the prices of goods into which copper entered to a large extent. The most noticeable replies to this were in the cases of copper wire and rail bonds. The latter have just dropped off a few per cent, raising the present discount from 20 to 25 per cent.

In different sections of the country there have been slightly different bases reported for the same kind of wire. Bare wire is reported on an 18-cent base at Chicago and Boston, and an 18- to 18½-cent base in New York. Rubber-covered averages close to 23 cents. In Chicago it is quoted on 20- to 23-cent base, in New York on 20- to 25-cent base, in Boston on a 22-cent base and in Atlanta on 23 cents. Weatherproof is given at Chicago as on 18- to 21½-cent base, at New York as 20 cents. Boston quotes 21 cents and Atlanta is on an 18-cent base.

Few other electric-railway materials have been reported off on price. Wood cross-arms recently dropped 5 per cent on carload lots at the mill, with about two weeks delivery. Cedar poles can be delivered from stock while two to three weeks is necessary on chestnut—a considerable improvement. Tape has fluctuated several times in the San Francisco district, the latest report being a 5-per cent increase after a 10-per cent decrease. There seems to be considerable ordering of friction and rubber tape by electric railways in this western territory. Certain kinds of hardware for use on wooden pole construction have decreased 10 to 15 per cent in the San Francisco district. Deliveries on practically all materials have improved since the end of last year.

## Maintenance Material Orders More Frequent

Smaller Companies Are Sailing Very Close on Their Supplies as Deliveries Become Better

At the present time with most war orders closed out manufacturers are able to make virtually immediate deliveries on maintenance equipment. One effect of this has been to cause traction companies to cut down the amounts of their orders for various kinds of equipment but to place these orders more frequently, trusting that they will be able, thereby, to benefit by any drop in price which they feel may be imminent.

This small-lot buying, however, has a counter effect in that higher net prices result. It is not reasonable to expect as satisfactory a price on small orders, though given regularly, as on large quantity orders. Much maintenance material is made on automatic machines where it is possible to procure a large production on each setting. In each case, machinery must be set and the cost of this work borne by the goods manufactured. This cost naturally decreases for each unit as the number of units increases.

## LARGER COMPANIES NOT RETRENCHING

Certain large traction systems in the east have not retreated from their former practice of keeping their stocks of maintenance equipment in first-class condition, regardless of the cost of that equipment. The additional cost has been returned in better operation and less time out for repair. Then, after the replacement had been effected and service restored the damaged part has been repaired at leisure where possible.

On smaller traction lines the stocks have been allowed to become so low that necessary repairs or replacements have meant idle equipment until the new part could be procured. This has happened on such replacements as commutator segments on controllers, whereupon there has come a hurry call for a "handful" of new segments.

The idea is similar to the housewife who buys one can of soup each day at maximum unit rate, rather than a case of each of several kinds at a more satisfactory rate by the case, and it is possible that the unit rate per case when prices are higher will be no greater than the unit rate per unit if prices should drop before the cases are all consumed. The chance was taken against a drop in price, and the insurance was the supply ready for any emergency. Buying by case lots tends to strengthen business in any commodity.

## No Material Reductions Expected in Lumber Prices

Horace F. Taylor, president of the National Wholesale Lumber Dealers' Association, writing from Buffalo, N. Y., to the Division of Public Works and Construction Developments of the United States Department of Labor, does not hesitate to say material reductions in lumber prices will develop very slowly, if at all. Mr. Taylor says:

The very clear majority of opinion we derive from representatives of the industry in all parts of the country, is one that there will be no further reduction in the cost of lumber for a long period, and that there is no safe ground, therefore, for postponing building in the hope of a price reduction in this material. We look upon the present rather quiet conditions as temporary only and due to industrial readjustment, soon to give place to very sound activity. The idea of making lumber offers no chance of reduction, both on account of materials and supplies, and the cost of labor which it seems not only necessary but desirable to maintain at as nearly an adequate rate as possible in view of the present cost of living. In addition to the ordinary increase in demand that is expected, an unusual call for lumber for export to Europe will soon begin to have its effect on the situation. Logging conditions during the present winter have been unfavorable, particularly in the North, and lumber production will apparently be less than that of normal years for some time to come. There is only one possible conclusion based upon the opinion of those consulted and that is that as far as the lumber market is concerned, the present is an advantageous time to purchase.

## Inventories of Surplus Government Material

The office of the Director of Sales, War Department, announces additional inventories of surplus materials furnished by the Construction Division of the Army. Among these are rated the following: Miscellaneous electrical equipment, exclusive of machinery, \$200,000; railway equipment, various-weight steel rail, \$1,200,000; ties, \$400,000.

## Rolling Stock

Waterville, Fairfield & Oakland Railway, Waterville, Me., has received two new 43-ft. steel passenger cars.

Citizens Railway, Clarksville, Tenn., would like to purchase one or two new cars this year if conditions appear favorable.

Stockton (Cal.) Electric Railway has received three of its order of five new-type safety cars. The other two are due to arrive at any time.

Nashville Railway and Lighting Company, Nashville, Tenn., has placed in service on the West Nashville line four new closed trail cars. These are center-entrance single-truck cars and were constructed entirely in the company's shops.

Trenton & Mercer County Traction Corporation, Trenton, N. J., recently had a car destroyed by fire while standing in the carhouse in Lalor Street. The car was run to the street, where it was burned. The building was not damaged.

## Trade Notes

Frank C. Hedley has joined the selling forces of the W. R. Kerschner Company, Inc., 50 Church Street, New York, N. Y.

Holden & White, Inc., have opened a Detroit office at 2213 Dime Bank Building, which will be in charge of Mr. Hinman, and Mr. Quinton will be located in the main office of the company in Chicago.

William H. Fernholz, Mack Building Milwaukee, Wis., has been appointed the exclusive representative in the Wisconsin territory for the Electrical Engineers' Equipment Company, 710 West Madison Street, Chicago.

Badenhausen Company, boiler and engine manufacturer, announces the opening of a Pittsburgh office at 5030 Jenkins Arcade, in charge of A. D. Neeld, Jr. This office will control the sales in the Ohio, West Virginia and western Pennsylvania territory.

E. Besuden, for the past sixteen years sales manager of the Jewett Car Company, has accepted the position of district manager of the railway department, Eastern territory, for the Chicago Varnish Company. Mr. Besuden will occupy offices at 50 Church Street, New York.

Underfeed Stoker Company of America has moved its general offices from Chicago to the Book Building in Detroit. This will not interfere with the sales work of the Chicago district sales offices in the Harris Trust Bldg., nor any of the other district offices.

G. William Crispell has been appointed production superintendent of the Electric Service Supplies Company, in its plant at Philadelphia, Pa. Mr. Crispell received his early training with the General Electric Company. After several years' experience on installation and maintenance work, he became laboratory assistant to the late Prof. James F. McElroy, consulting engineer with the Consolidated Car Heating Company on both electric and steam railway specialties, and for several years was in charge of the electrical manufacturing of this company. Before assuming his present position Mr. Crispell was assistant superintendent of the Westinghouse Electric Products Company, Mansfield, Ohio.

Gear Standardization Meeting.—A well-attended meeting of the standardization committee of the American Gear Manufacturers Association was held at the Hotel Statler, Buffalo, N. Y., on Feb. 10 and 11. Every committee of the association had representatives in attendance, and a well-defined program was laid out for future activities. All phases of the subject of standardization were discussed. According to the action taken in previous sessions, all committees were urged to seek the co-operation of other organizations interested in the standardization of gears.

It is probable that quite an advance toward the standardization of some of the phases will be made at the time of the annual meeting which is to be held in April.

Holland Trolley Supply Company, Cleveland, Ohio, has just opened up a new foundry department and is now ready to take care of its trolley wheel requirements with immediate deliveries of any one of its forty-one different types. In the past the company has been handicapped to some extent in the matter of guaranteeing its mixture, owing to the necessity of having various foundries make up its product, but this trouble is now overcome. No expense has been spared in the equipment purchased, and as the superintendent has had more than forty years' experience in the bronze business, ten years of this being spent manufacturing trolley wheels, the company is looking forward to a large increase in its present volume of business.

C. C. Farmer, until recently assistant Western manager and resident engineer of the Westinghouse Air Brake Company, has been advanced to the position of director of engineering in the same company. Mr. Farmer began his railway career with the Southern Pacific Railway, but in 1891 joined the forces of the Missouri, Kansas & Texas Railway as supervisor of airbrake repairs and later as airbrake inspector of the entire road. After a short service on the Central Railway, he became connected with the Westinghouse Company. John S. Y. Fralich has succeeded Mr. Palmer as resident engineer of the Western district. He has been with the Westinghouse Air Brake Company since June, 1904. Previously he was with the Pennsylvania Railroad.

R. E. S. Geare has been elected president of the Mid-West Manufacturing Company, recently incorporated. Mr. Geare is well known to the construction and power-plant field in Chicago and the Middle West because of his active representation of the T. L. Smith Company, Manistee Iron Works Company, Geare & Company, and others, which work he will still continue. The Mid-West Manufacturing Company has located its factory in Chicago, with general offices in the Old Colony Building. It has acquired the sales and manufacturing rights of the "Continental" chain grate stoker from the Manistee Iron Works, and the "Chainrip" pipe vise and tools from the Gerold Manufacturing Company. In addition to this the manufacture of special machines, tools and dies; rebuilding of construction and power plant machinery together with the installation of such machinery will constitute an important part of the new company's activity.

Roller-Smith Company, 233 Broadway, New York City, announces the appointment of Frank R. Ryan to the sales force of its Chicago office at 740 Monadnock Block. Mr. Ryan graduated from the electrical engineering course of Notre Dame University, spent

over a year in the testing department of the Commonwealth Edison Company, about the same time in the testing and operating department of the Sanitary District of Chicago, and was subsequently connected with the Krehbiel Company, consulting engineers of Chicago. For the past six months he has been in the Signal Corps. Mr. Ryan takes the position which was held by Charles H. Nicholson before the latter entered the service and subsequently took charge of the company's Detroit office. The Roller-Smith Company also announces the appointment of the P. I. Perkins Company, 141 Milk Street, Boston, Mass., as its agent in Massachusetts, Connecticut and Rhode Island. The P. I. Perkins Company will handle in this territory the Roller-Smith Company's line of instruments, circuit breakers and meters. W. A. Blachford will give his special attention to the company's Roller-Smith activities.

### New Advertising Literature

Harry DeSteele, New York: Folder on assembled commutator segments, field coils, armature coils and general repair work.

Rome (N. Y.) Wire Company: Leaflet entitled "Copper History," giving monthly average prices of copper from 1887 to 1918.

Blaw-Knox Company, Pittsburgh, Pa.: A folder, "Build Your Roads with Blawforms," and a book, "Blawforms' for Road Construction."

Green Fuel Economizer Company, Beacon, N. Y.: Bulletin No. 151, "A Summary of the Facts Regarding Green's Improved Patented Fuel Economizer."

Lakewood Engineering Company, Cleveland, Ohio: Bulletin No. 25 entitled "Flat-Wheel Haulage Systems," on industrial storage-battery tractors and trucks.

Philadelphia (Pa.) Gear Works: 1919 catalog describing belt, spiral and generated spur gears, rawhide and micarta pinions, worms and worm gears, racks, lead screws, sprockets and chains.

Ingersoll-Rand Company, Easton, Pa.: Bulletin No. 9120 on Leyner oil furnace No. 3; No. 9010 on the Sergeant ticket canceling box; No. 9123 on "Imperial" tie tamping outfits; No. 9026 on Ingersoll-Rand high-speed piston valve steam engine, class "FP"; No. 9028 on Ingersoll-Rand equipment for sugar factory and refinery service.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. New 1276-page supply catalog complete under one cover. This supersedes and replaces loose-leaf and sectional catalogs that this company has been publishing for several years past. The new catalog has a very complete index of both style numbers and apparatus manufactured, gives a table of "approximate cost multipliers" and contains considerable information of a technical and engineering nature.

### Track and Roadway

Pensacola, Fla.—Surveys have been made and plans submitted to the County Commissioners for the construction of a line from Pensacola to Flomaton, Ala., about 40 miles. Herbert A. Smith, Gonzalez, Fla., is interested.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—It is reported that the Chicago, North Shore & Milwaukee Railroad will extend its Libertyville branch to Crystal Lake.

Evansville & New Harmony Traction Company, Evansville, Ind.—Plans are being revived for the construction of this company's proposed line from Evansville to Cynthiana and New Harmony. C. J. Seibert, Evansville, general manager. (Jan. 22, '16.)

Frankfort & Shelbyville Traction Company, Shelbyville, Ky.—Two new bridges, one 150 ft. and the other 90 ft., will be erected by the Frankfort & Shelbyville Traction Company in connection with its proposed line to connect Frankfort & Shelbyville. F. H. Frankland, Waddell & Son, Inc., New York, N. Y., president. (Feb. 15, '19.)

New Orleans Railway & Light Company, New Orleans, La.—About \$60,000 will be spent by the New Orleans Railway & Light Company for new frogs and switches.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—Among improvements contemplated by the Trenton & Mercer County Traction Corporation this spring is the construction of an extension of the Market Street division to the new municipal dock along the Delaware River. About 12,000 new ties will also be placed in connection with general repairs to the roadbed on the various divisions.

New York State Railways, Utica, N. Y.—The Public Service Commission for the Second District of New York recently passed an order granting the New York State Railways an extension of time until July 1 to make track improvements in Whitesboro.

Carolina Power & Light Company, Raleigh, N. C.—The construction of an extension from Goldsboro to Mount Olive is being contemplated by the Carolina Power & Light Company.

Toronto & York Radial Railway, Toronto, Ont.—By the terms of an agreement arrived at between representatives of the city of Toronto and the Toronto & York Radial Railway, the city has arranged to purchase from the company for \$590,000 the Yonge Street section of the Metropolitan division, lying between its southern terminus near Farnham Avenue and the city limits, together with certain rolling stock and the company's rights and franchise in connection with this section. The program of the city includes the establishment of a terminal at the Union station for the transshipment of freight and the paving and double-tracking of the section acquired immediately the agreement is ratified.

Dallas (Tex.) Railway.—Work has just been completed by the Dallas Railway on the reconstruction of its tracks on Jefferson Street between Wood and Commerce Streets. The company will begin early this month on the reconstruction of its tracks on Main Street from Ervay to Poydrus Streets. Heavier rails will be laid on a concrete foundation. On the completion of this work the company will reconstruct the tracks on Jefferson Avenue from Lancaster to Polk Streets. The work will cost about \$350,000.

Eastland, Wichita Falls & Gulf Railroad, Eastland, Tex.—Bids are being asked by the Eastland, Wichita Falls & Gulf Railroad for the construction of a line from Eastland to Mangum, 7 miles. O. B. Colquitt, president, and C. H. Chamberlin, chief engineer.

Newport News & Hampton Railway, Gas & Electric Company, Newport News, Va.—Plans are being made by the Newport News & Hampton Railway, Gas & Electric Company for extensive new construction work this spring.

### Power Houses, Shops and Buildings

Birmingham Railway, Light & Power Company, Birmingham, Ala.—Work will be begun within the next few months by the Birmingham Railway, Light & Power Company on the installation of new equipment and improvements to its gas plant at Third Avenue and Thirteenth Street at a cost of about \$75,000. A new water gas set will be installed.

Southwestern Gas & Electric Company, Texarkana, Ark.—This company will reconstruct its carhouse and shops recently damaged by fire to the extent of about \$75,000.

San Diego & Arizona Railway, San Diego, Cal.—A contract has recently been awarded by the San Diego & Arizona Railway for the erection of a boiler plant at Sixteenth and Main Streets in connection with other improvements, the entire work being estimated to cost \$19,527.

Washington Railway & Electric Company, Washington, D. C.—Fire recently destroyed a part of the Eckington carhouse of the Washington Railway & Electric Company at Fourth and T Streets, northeast, together with twelve cars. The loss is estimated at approximately \$150,000.

Pittsburgh (Pa.) Railways.—A new station will be built by the Pittsburgh Railways at Castle Shannon. An addition will also be built by the company to its power house at McKees Rocks.

Montreal (Que.) Tramways.—Plans have been prepared by the Montreal Tramways for the erection of a sub-station on Cote Street, to cost \$400,000, and also for a new carhouse at Fullum and Mount Royal Streets, to cost \$110,000.