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The Railway Industry—An Opportunity for Young Men

A GREAT danger that confronts us as we struggle through and out of the "slough of despond" is that the electric railway business will cease to attract young men of the caliber needed to solve the increasingly difficult problems of electric railway transportation. This must be met by the use of every effort to show these men that if the right stuff is in them the very difficulties that are to be overcome make the work the more fascinating. A man who has had long and varied experience in all phases of electric railway work said recently that had he a son that son would be trained for the electric railway business. His idea was that there is a great future for the rising generation because many of the pioneers now approaching the age of retirement must sooner or later give place to the men trained in the school of present-day rather than early experience. Just as soon as a rising man demonstrates that he can handle the situation better than those now in control the latter willingly or perforce will step out and let him do it. The ambitious youngster has little to lose and all to gain in this field even if the gain should peradventure prove to be largely in experience which will fit him for usefulness elsewhere. Go to it, young fellow, and make a place for yourself!

Boost the Salaries of Efficient Department Heads Also

A WELL TRAINED, efficient official or department head can contribute a great deal toward an increased net income for his company, but he cannot be expected always to remain at his post for love of the work. Unless he receives compensation for his services comparable with that which he can realize in other fields, he will join the procession of those who are leaving for "fresh fields and pastures new."

The men higher up may be tempted to throw up their hands in despair at the suggestion of paying more for technical and administrative talent. But the number of men possessing this qualification are not numerous, and but a slight effect on the gross expenses would be involved in following this plan. The wage earner has received increases at least commensurate with the increased cost of living; the salaried man has not.

In one department of a certain railway there are 150 men and forty foremen. To hold these men increases in wages have had to be granted which in the year 1918 amounted to $3,645 per month, or $43,740 for the year. Increases for all departments amounted to at least $100,000 for the year, a very substantial sum. It would not seem out of the way to distribute, say, a tenth of this amount among the department heads. The "boss" should be entitled to at least an equal increase with his subordinate.

Applying Salesmanship to the Engineering Standards

EITHER the work of the several technical committees of the Engineering Association is worthy of more practical appreciation than it has so far received, or it does not justify the effort that has been made during the sixteen years of the association's existence in formulating standards of construction and operation. In other words, if one were to judge of the value of these standards by the extent to which they are used today he would be apt to conclude that they are not worth while. This would be a mistaken conclusion, for the standards have not yet been given a fair trial. This is at least partly due to a lack of information as to what the standards are, and what they could do, if they receive a fair chance, in the way of reducing costs and facilitating prompt delivery.

The announced intention of the standards committee, to endeavor to "sell" the standards to industry, is to be commended and fostered. The managers and other executives are the men who need to be reached. It is a little surprising that the engineers themselves have not been able to do more in the way of influencing their respective managements than they have, but probably the standards need to be "sold" to them as well as to their employers.

Obviously, the manufacturers are anxious to see the standards developed. They can make more money as well as give better service if the number of details which they must look after is reduced. But they cannot urge the adoption of standards unduly lest they be accused of "having an axe to grind." The man who is spending the money for railway supplies, *i.e.*, the president or the general manager, is the one who in the long run will dictate what he is to get; hence it is necessary to convince him that he will get essentially what he wants at a lower price and more promptly, by backing up his engineers in their desire to use standard products. He ought to be easier to convince, now that money is so scarce.

To our mind the development of standards, the formulation of recommended specifications and practices and the publication of miscellaneous practices that may prove helpful to the industry, taken together, form a group of functions of the Engineering Association which are second only in importance to the function of promoting a general spirit of co-operation. After laboriously getting this material together, however, it appears that the association must organize itself as an advertising agency to disseminate the facts as to what it has accomplished. A good start in this direction will be made at the convention, where every effort will be exerted to show the extent to which the standards have been useful. Once they become so generally adopted that a marked saving in first cost follows their use, less effort will be required to popularize them.

What Importance Should Attach to Car Clearance in Special Track-Work Layouts

THE subject of a standard system of track spirals, which has had no little discussion recently, has an affinity for the correlated subject of car clearance in special track work, *i.e.*, double track branch-offs, plain curves and connecting curves at crossings. Spiral curves are used in such layouts almost universally and mainly to provide car clearance. There is a secondary but almost equally important use for the spiral in all curves except those of very large radius. This has reference to the easement provided by the spirals which the plain curve of one radius does not give. The easement, by overcoming the objectionable sway of a car which occurs when it is suddenly required to change its direction, tends to promote the comfort of passengers and also conduces to less rapid wear of the curved rails.

It is probably quite true, however, that car clearance has been the greatest single factor in promoting and continuing the use of spiral clearance curves. At the low speed, which good special track-work maintenance and careful operating require over special track-work, most cars will pass around sharp, well-greased curves of single radius without undue annoyance to passengers and unreasonable wear on curves. If these were the sole considerations it is very likely that spirals could be eliminated to a large degree. Sometimes it is absolutely necessary to use spirals to dodge fixed obstructions in the street.

With the provision of clearance as the principal factor, it becomes worth while to consider whether we may not have been making an expensive fetich of this clearance matter. The use of spirals or other means to get clearance is generally accompanied by a greatly increased distance between the tracks at the center of the curves and longer over-all tangents are required. Both of these factors lead to extraordinary increases in paving areas which the companies must maintain. In addition, new clearance layouts almost always require extra expense for setting back curbs and sewer inlets, relocating poles and similar work which must be done to permit the installation. This leads to the consideration of such questions as, (1) To what extent is car clearance desirable? (2) How much of the extra installation and maintenance expense involved is warranted? (3) What unit of measure can be adopted to serve as a guide in selecting points for clearance? (4) What weight shall be given to such factors as car headway, through routes and street traffic congestion? (5) Is it always economical to adopt and use clearance layouts on all parts of a system?

One of the largest systems in the East has answered these queries along the following lines: The need for clearance in special work is not universal on the system. Its cost in many places would be prohibitive, owing to the expense in shifting and altering obstructions such as elevated railroad columns, parts of bridge structures and large terminal building details. On the other hand, certain locations do require clearance under very frequent headways and congested street conditions. The car schedules, the difficulties, probable cost of installation and the traffic conditions are duly considered and the superintendent of transportation, jointly with the engineers, decides when and where clearance shall be insisted upon. It is surprising to observe the lack of operating difficulty with some very close headways under which no-clearance layouts are in service on the road referred to.

Another feature which makes all clearance plans somewhat futile is the increasing tendency to frequent changes in car design. Many times the track engineers have made pretty clearance layouts only to have them practically thrown into discard by new cars, purchased more than once without consideration as to whether they would clear on layouts which would clear existing equipment. Further, no management would be inclined not to use a better car design, simply because clearance could not be had in the special track work.

Publicity Campaign Needed More Than Ever Now

HON. WILLIAM D. B. AINEY, chairman of the Public Service Commission of Pennsylvania, whose friendly attitude and consistent fairness to and interest in the general well-being of the utilities has been the subject of comment in this paper before, took occasion in his address before the Federal Commission week before last to criticise the character of the publicity which the hearings have received. His impression was that the newspaper reports had served more to confuse the public mind than to clarify it upon the crucial conditions of the electric railway industry and the vital interest it has in this situation.

Undoubtedly, some of the news of the testimony at the hearings has appeared in such form as to give an incomplete and distorted impression of the railway case. Nevertheless, we believe that the net result of the hearings thus far, viewed purely from the publicity which they have received in the daily press, has been of great benefit to the electric railway industry.

In the first place, the frequent reference to the Federal Electric Railways Commission hearings in Washington by the newspapers all over the country has emphasized in the public mind the fact that there is an electric railway problem. In many cases the existence of a local railway problem was realized, but the fact that the situation was national was not appreciated. This is in itself a great gain. But probably the greatest benefit has been derived from the many editorials which have been inspired by the investigation at Washington. It is notable, also, that these editorial comments on the part of the newspapers have been very largely of a sympathetic tone, and further they are not often subject to the criticism of inaccuracy that has been applicable to the news reports.

Some erroneous impressions have undoubtedly been caused by misleading headlines and the giving of undue emphasis in some newspaper offices to isolated instances, statements and opinions of some witnesses, the headlines being the principal offenders rather than misstatements in the body of the article, in the instances which have come to our attention. But admitting these weaknesses, it must be remembered that the publication of extended technical accounts of the testimony presented daily before the commission has hardly been within the province of the daily papers. Those who want reports of this kind seek them in the technical press.

Thinking ahead, then, on the assumption that the publicity gained thus far as the result of the activities of the publicity committee of the Committee of One Hundred, A. E. R. A., has been of a character beneficial to the industry, the question arises whether this pro-

gram of publicity should be concluded with the completion of the testimony before the commission. It seems to us that the opening for publicity which has been afforded by these national hearings, should be made only the beginning of a carefully planned and well-executed national publicity campaign in behalf of the street railway industry, and this on a scale that will compel attention. That the problem of the railways is very largely a question of education of the public to an appreciation of the facts as they are to-day and to an understanding of how vitally interested it is in the integrity and prosperity of the local transportation company, was repeated over and over again by the witnesses before the Federal Commission. We have on several occasions during the past three years endeavored to encourage such a campaign, and we believe it would have served a very helpful purpose and perhaps alleviated the present situation. Now, more than ever, does this educational publicity campaign seem desirable in order to set before the public in the simple plain manner admonished by Mr. Ainey, what the railways now want, and perhaps a little later what the Federal Commission recommends.

In the final analysis the public is the court of last resort, and it is only through this court that any recommendation favorable to the industry which the Federal Commission may see fit to make, can be executed. An endeavor should therefore be made to educate the public in the same thorough manner with which the railway case has been placed before the commission.

Any Fare Scheme Must Keep the Traffic Cream

THE electric railway operator knows without elaborate argument that the short-haul rider furnishes the cream of the traffic. It is, therefore, remarkable that so few fare adjustments have taken that fact into consideration. The central-area plan did so to a degree, but as no very simple plan was apparent for collecting correspondingly low fares for short-haul passengers in the outer districts large losses were experienced there. In addition, the central-area scheme lacked flexibility and fairness because there are many areas within most cities with well-defined neighborhood centers in addition to the main downtown district. When we see that a 40 per cent increase in fare has brought a 20 per cent increase in revenue, we cannot ignore the unpleasant fact that the operating cost per passenger has also gone up with the fare because the loss of the short-haul riders has greatly increased the average length of ride of the remaining passengers. The seat-use factor which follows may prove to be so poor that the operator is tempted either to cut service or to notch up the fare again, with disastrous consequences to the railway.

As a company cannot continue this sort of thing very long without becoming insolvent, a solution is absolutely necessary. If we cannot make the short rider pay his fair share of higher costs, we must necessarily seek some means of creating a new kind of service, say by short-route cars, which will bring the needed increase from the *voluntary* riding of the public wherever short-haul low-fare riding (be it only of four or five blocks) can be built up for less than it costs to get it. Let no man say it cannot be done until he has taken account of the pedestrians who are now passing up the opportunity to take short rides because there is no appeal to the bargain instinct inherent in every human being.

Unit Construction of Modern Cars

THE development of the electric railway car is an evolution from the simple to the complex—from the K controller to multiple unit, from the hand brake and hand sander to the air brake and air sander, from the hand-operated door and step to the door engine, etc. For each of these changes there is ample reason because of the increased car mileage or higher earning power which these and other devices give. For a company to give up any of these automatic mechanisms because they may cost more to maintain would be to take an inexcusable step backward.

However, the need for automatic devices does not exclude us from seeking ways and means for simplifying their upkeep. Such seeking is especially necessary in the case of smaller or isolated properties which cannot afford to employ a specialist in each class of equipment. Even the outlying divisions of a large system are at a disadvantage as regards the maintenance of their apparatus to the same high standard as is possible at the larger shops of the system. What can be done in cases of this kind?

To a degree the answer is furnished by an example of steam railroad practice. The triple valve goes to the manufacturer rather than to the railroad shops. In this case, a prime reason is that where equipment is subject to continual interchange from road to road the railroad making the last repair would not care to be blamed for an accident following the use of the repaired apparatus on another road. Steam railroads also do not attempt to repair at the roundhouse such complex but standardized unit devices as injectors, lubricators and air compressors. These are replaced always by units already repaired and tested up to standard at the central plant. But, in answer to our question, we can find an example nearer home in the practice of several makers of fare-collection devices who take care of all repairs and replacements in their rental agreements.

If it were possible to build up a car of standard units, just as complete houses are now being sold, the user of the car would have no other concern than that of keeping the parts up to a certain standard of inspection. With standardized cars in use, he would always have certain spare parts on hand for replacement while the replaced part was off for repair or renewal. For example, switch groups could be sent off complete after they had made a specified mileage or suffered in an accident, instead of attempting to make a complete overhaul with imperfect facilities at home. The scheme could be carried further than the repairing and maintaining of moving equipment up to the manufacturer's standard. In the case of doors, steps, sash and other parts of a car, it ought to be possible for the user to advise the car builder that Pieces 4A, 6B, 5C of Car Type A1 are required for replacement, and the parts shipped ought to fit in as a matter of course. After all, some such plan as the foregoing is already in practice to a degree and very much to the advantage of all.

W. H. Hewlings' recent statement before the Federal Electric Railways Commission that the safety car, because standardized, had increased only 50 per cent in cost compared with a 100 per cent increase in non-standardized cars shows what standardization means to the purchaser regardless of the maintenance economies outlined. Further progress along this line should bring still better results.

The Zone Fare in Practice

CROYDON

The Great Southern Suburb of London Where the Principle of the Zone Fare Is Shown at Its Best in Capturing the Walker—Nearly 80 Per Cent of the Riders Pay the Minimum Penny Fare — No Hesitation in Eliminating an Unprofitable, Unnecessary Service — The Important Difference Between a Zone-Fare Transfer and a Universal-Fare Transfer Is, at Croydon, the Difference Between Making Money and Losing It — Why Buses Can Create Havoc

BY WALTER JACKSON

THERE are about 182,000 people in Croydon, and two-thirds of the breadwinners work in London. The workers go to and fro, chiefly, on the suburban trains, making no use of local facilities except in so far as they can be induced to ride the short distances between the steam railway station and their homes. It follows, then, that the Croydon Corporation Tramways must look for the bulk of its everyday traffic in in-town, short-distance riding, more particularly the riding to and from the local shopping district. On Saturdays, Sundays and holidays there is an accretion due to pleasure riding, but the real state of affairs is expressed by the fact that between 75 and 80 per cent of the passengers are penny riders—and a penny new (April, 1919) means a ride of 1.8 miles or less.

CROYDON, TOO, HAS A FLATIRON BUILDING

In regard to the route layout of the Croydon Corporation Tramways, shown in the map on page 468, attention is directed first to the shortest one, the line from Addiscombe station to the through line at Crown Hill. It is only 1½ miles long. Everyone knows what the fate of this line would be under the universal fare system. It would be simply a "sucker" for transfers to and from the through line. Few would care to pay full fare for so short a maximum ride, so that the bulk of the passengers would simply be people who were getting something extra for their money. By and by the management would realize that there was nothing in that sort of business and would seek to have the costly stub eliminated.

But under the short-ride fare system, a residential line like this simply needs at one end a shopping district, or anything else that sets up a current of travel, to make it both a self-sustaining line and a feeder to the connecting through line. Hence at Croydon such a line never gets less than five-minute service, normal headways of three to four minutes and holiday (Saturday) headways of two minutes. It does not figure on the books as a line with 80 to 90 per cent unproductive transfers, but as an earner of weekly averages of 35 cents per car-mile and Saturday averages of 40 cents per car-mile with corresponding traffic densities of 16.72 and 20.92 passengers per car-mile. Even when some 30 per cent allowance is made for the absence of bus competition, the Addiscombe line is still the star route of the Croydon Corporation Tramways. The Addiscombe line draws good traffic all the time, but it is exceptionally popular in wet weather when the "seasons," as commuters are called, do not care to walk up the side streets to their fine residences.

From this example of profitable development of a short line due to short-ride fares, we pass to the direct opposite—the abandonment of a portion of line that could not be made to pay under any circumstances. There is no more reason for holding on to an unprofitable piece of track than for holding on to a grocery or tobacco shop when there are not enough customers. This was Mr. Goodyer's point of view. Even though the system was the property of the municipality, he saw no reason why the public should be taxed for the sake of a very small minority, particularly as that minority had an alternative service.

The section abandoned on March 8, 1913, and since used as a quarry for supplying renewal material for other lines, was a 3960 ft. stretch (see map). It served a very poor district where Saturdays and Mondays were the only worth-while days. The management tried through cars, short headways and everything else it could think of, but there were not enough patrons under any scheme. The fact that the line was losing money did not deter opponents to abandonment from asserting that it ought to be continued on the grounds of general community development, public convenience, etc. The people in the district, however, had alternative routes by way of the Thornton Heath line and the "Cloister"-Portland Road line, the longest additional time for any patron on account of the greater walk not being more than eight minutes.

Moreover, Mr. Goodyer held fast to the principle that every route should be self-sustaining. To emphasize his arguments, he communicated with eighty-eight

municipal tramways to learn what they had done in similar cases. The gist of his investigation is presented in Table I. The evidence collected clearly indicated that the managers of British municipal tramways look at their work in an entirely businesslike manner. They do not go into a panic at the thought of giving up an unprofitable line.

After the submission of Mr. Goodyer's report on Nov. 26, 1912, the section in dispute was operated intermittently until the final shut-down on March 8, 1913. From the time of its opening in November, 1906, to March, 1913, the capital expenditure had been £9,000, and sinking fund and interest payments had totaled £461.

CROYDON ROUTES AND SERVICES

The total trackage of the Croydon Corporation Tramways is approximately 17.5 miles measured as single track. Of this about 4.2 miles are operated as single-track owing to the narrowness of certain streets. There is a stretch of single track on Crown Hill, the busiest part of the system. Here it is necessary to have a traffic regulator control the movement of cars by throwing a hand switch-light signal to permit one to three cars to go by at one time. The same starter also controls a semaphore which notifies passengers from the through line that an Addiscombe car is waiting.

The main route, known as the Norbury line, runs from the London County Council terminus at Norbury to Purley, 5¾ miles distant. The terminus-to-terminus service on this line is from two and one-half to five minutes. In war days there was a certain amount of early morning traffic for munitions business, but now that normal conditions have been restored the periods of heaviest loading are 8 to 9.30 a.m., 12.30 to 2 p.m., and 5.30 to 8 p.m. As elsewhere, cars are run from 5 a.m. to 12 o'clock midnight (pre-war, 1 a.m.). While a schedule speed of 8 to 9 m.p.h. is possible, the deterioration of the track, the large number of new motormen and other causes connected with the war have made it desirable to set the schedule speed at 7.74 m.p.h. There are no turnbacks on the Norbury line, as traffic is fairly consistent throughout, but crossovers are provided to take care of emergencies due to breakdown of vehicles and the like. Stops (far-side) are 600 to 900 ft.

TABLE 1—CROYDON QUESTIONNAIRE REGARDING ABANDONED LINES

Number of systems communicated with	88
Number of systems replied	88
Number of systems having lines not in operation at all	13
Number of systems having lines operated only in part	15
Number of systems having lines with reduced service	6

(a) SYSTEMS HAVING LINES NOT IN OPERATION AT ALL

Population	Length in Yards	Particulars	Capital Cost	Annual Charges
32,000	1,232	Line has been shut down for some time, owing to revenue not meeting operating expenses	*	*
36,000	2,200	Two sections of line not operated, owing to revenue being unremunerative	£12,500	£750
42,000	1,100	When line was operated, a loss of £15 per week was involved	£4,500	£270
46,000	150		*	*
50,000	440		£2,000	*
80,000	250	Operation of line resulted in a constant loss	*	*
97,614	300	Service on this portion discontinued recently as an experiment	*	*
100,000	1,320	Not operated for between six and seven years. But recently in connection with a short extension, about one-third has been operated	*	*
110,000	714	Operation of line resulted in serious loss	£3,770	£200
135,000	1,320	With the exception of two early morning workmen's journeys, line has been closed down for seven years	*	*
164,458	1,320	Operation of line resulted in a serious loss	£9,047	£462
180,000	1,290	Line not operated since 1904, owing to operating results being unsatisfactory	£7,200	£193.12.5
200,000	*	Several sections not operated. Manager says there are several sections which in his opinion ought also to be closed down, as they are simply a burden to the finances of the undertaking. In his view they should never have been constructed	£20,000	£1,200

(b) SYSTEMS HAVING LINES OPERATED ONLY IN PART

Population	Length in Yards	Particulars	Capital Cost	Annual Charges
31,000	*	One line not operated until twelve noon, owing to scarcity of passengers, but line pays well during remainder of the day	*	*
38,000	175	Used only on Saturdays and other special occasions	*	*
40,000	700	Run only between 1 p.m. and dusk	*	*
40,000	660	Operated occasionally, viz., on Saturdays to convey passengers to and from football matches, and during the summer for musical entertainments in public parks	£4,580	£240
86,767	393	Operated only on Saturday afternoons	*	*
120,000	1,000	Operated only during winter time on Sundays. During a few months in summer, line is worked on week-days for a few hours in the afternoons, and on Saturdays from noon until evening, and all day on Sundays	£18,666	£1,076
120,000	880	Operated only during summer months	*	*
122,000	440	Line operated only on Sundays at church times, and on bank holidays	£2,000	£120
130,000	*	Four separate stretches of track are operated only occasionally; three have never been regularly operated	£14,00	*
178,000	1,672	Operated during summer months only	£5,600	£336
178,000	*	One route to Sea Beach used only for summer traffic	*	*
200,000	1,100 v	Used only six hours on Saturdays; lying idle sixty hours per week	£14,500	£800
244,255	880	Line worked only Saturday and Sunday all day, and Wednesday part of day	£7,500	£412.10s.
328,000	840	Morning and evening operation for workmen's traffic	£3,233	£194
470,950	*	Line not in regular use	£4,714	£260

(c) SYSTEMS HAVING LINES WITH REDUCED SERVICES

Population	Length in Yards	Particulars	Capital Cost	Annual Charges
30,000	985	This length of line has been working at a loss. Services now running seven hours daily, instead of fifteen, as formerly. No service on Sundays	£6,500	£240
45,000	*	Forty minutes service on ordinary days; twenty minutes' service on Saturdays and Sundays. Results pay operating expenses, but not annual charges	*	*
200,000	*	Two sections upon which half-hour services are operated. As they do not meet operating expenses, manager thinks that they should be closed down altogether	*	*
122,000	1,320	Line formerly operated with six-minute service, but now twenty-four minute service	*	*
350,000	*	Services reduced to twenty minutes during week days on one or two unremunerative routes		
838,000	*	On two short routes, owing to financial results proving unsatisfactory, services have been reduced	£13,000	£243

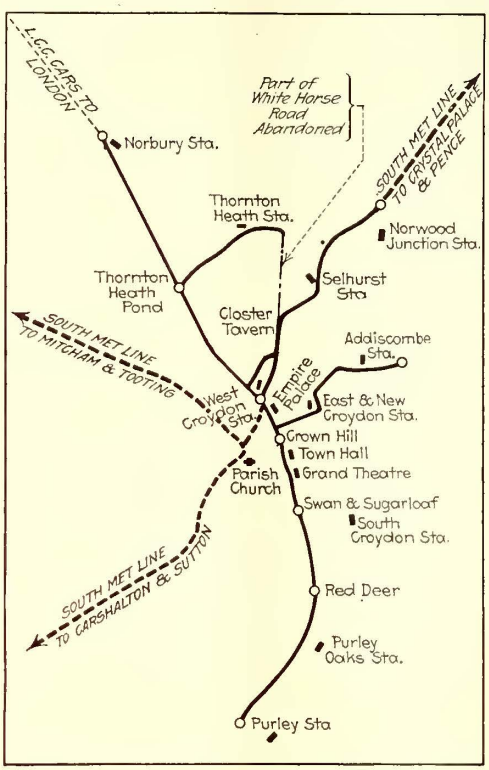
* Data not given.

(d) SOME MANAGERIAL VIEWS AS TO DEALING WITH UNREMUNERATIVE LINES

Population	Views of Manager
14,600	I quite agree that if a line does not pay operating expenses, the best thing to do is to "cut" the loss. One has, however, to overcome strong local prejudice in shutting down a line, and municipal tramways are run more on "sentimental" than on business lines.
45,000	If a line will not even pay operating expenses, I think it is far better to let it lie idle and "cut" the loss.
86,767	There is no doubt that it is better to "cut" the loss than to throw good money after bad in making a further loss by running cars that are not wanted by the traveling public.
135,000	In my opinion, it is better to pay the yearly capital charges without incurring an additional heavy loss through the operating expenses.
200,000	Personally, I see no course open, from a business point of view, but to close down sections where the receipts do not meet the actual running charges.
200,000	I certainly agree that it is better to "cut" the loss by paying the capital charges than to increase such loss by operating unremunerative sections.
400,000	If I had a line which had no traffic, I should ask the tramways committee to "take it up." While it lies in the street there will always be everlasting demands from selfish people that it be operated, even if the system loses heavily thereby.
500,000	If a line loses money in operation, it is certainly always better to face the loss on interest and sinking fund, rather than increase it by loss in operating expenses.

The service on one part of the Norbury line is supplemented by other cars. For the 1¾ miles between Thornton Heath Pond and Crown Hill, the passenger has the choice of either the Norbury or the Thornton Heath cars all day long; and to Purley, after 12 o'clock noon. This second route, the Thornton Heath line, is 4¼ miles long and has a five-minute service.

The third route, or Norwood line, is operated from a loop in the center of Croydon to the Penge entrance of the famous Crystal Palace, which, however, has not been open to the public during the war. The total length of this route is 5.08 miles, 2.58 miles of which is on track of the Croydon Corporation Tramways and the remainder on track of the South Metropolitan Tramways. The Croydon service of five-minute service way to Penge is supplemented by the five-minute head of the South Metropolitan Company beginning at High Level, Crystal Palace. Consequently, two and one-half minute headways, and better on holidays, prevail over the greater part of this route. The fourth or Addiscombe route has been previously described.



CROYDON ROUTE PLAN, SHOWING WHY A TRANSFER MEANS TWO HALF-FARES COLLECTED AT ONE TIME

The foregoing services are handled with three types of cars, as follows: Thirty-five cars, with reverse stairways, which seat twenty-two below and thirty above; thirty single-truck cars, which seat twenty-two below and thirty-two above; ten double-truck cars, used on main line only, which seat thirty passengers below and thirty-eight above. Owing to the large amount of pleasure riding, the upper decks are open. They are fitted with cross seats, which is the usual custom in Croydon, with the seating arrangement on top decks.

In ordinary times single queues are used in loading cars at busy places. On bank holidays the rush of people from London has made it necessary to handle queues four or five persons abreast.

Changes in Fare Have Not Hurt the Riding Habit Permanently

The first increase in fare, which became effective on Aug. 1, 1916, equalized the fares throughout the northern and southern parts of the borough. It also shortened the stages, as shown in Table II. At the time this revision went into effect, practically 90 per cent of the passengers were paying 1d. fares. As far as this class was concerned, the increase would have approximated 30 per cent. It was assumed, however, that enough passengers would drop off to make the increase in revenue only 8 per cent, or £7,472. The actual increase was 12 per cent, or £13,000.

By May, 1918, the continued advance in costs forced a second increase, averaging 28.3 per cent for all classes of passengers. This was attained by shortening stages (see Table II, lower part), eliminating odd fares like 1½d., 2½d., etc. (as elsewhere in the London district), and raising the maximum fare from 3d. to 4d. The workmen's fares, however, were not affected by the second increase. Mr. Goodyer believes that ordinary-rate riding will go up when the shorter workday comes into effect, because the workmen will have more leisure in the afternoon and evening.

As with the first revision, the results in revenue were better than anticipated. It was hoped that if one passenger in four averaged 25 per cent more fare, the increase in revenue would cover the war bonuses, which were estimated at £7,717. If all passengers were retained at the higher rate, the increase in revenue would have been £30,840. The actual results for the full fiscal year ended March 31, 1919, show a 21 per cent increase in revenue, or £23,407 on the basis of eleven months' operation under the increased fares.

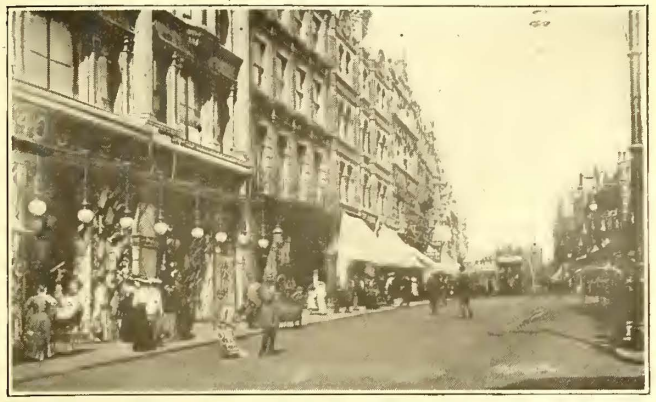
Table III shows the rapid recovery of traffic for the fiscal year ended March 31, 1918, following the first fare increase, and Table IV shows the comparatively small drop in travel in May, 1918, following the second fare increase. These results were far more favorable than can be shown by American electric railways. They bear witness to the fact that the temptation of the Croydon short-haul rider to walk was soon overcome by the force of his habit of riding early, late and often.

Tables V and VI, page 473, show the weekly returns for the weeks ended Aug. 16, 1918, and Jan. 31, 1919, for each day of the week and for each of the four routes. These figures give an excellent idea of the high earning power possible with a graduated fare in what is practically a non-industrial community. In August, when holiday and pleasure travel is at its best, the earnings of the Norbury line connecting with London averaged 22.04d. (44.08 cents), reaching a maximum of 27.13d. (54.26 cents) on Sundays with a density of 13.45 passengers per car-mile. The January return gives a better idea of the traffic for which Croydon residents alone are responsible. In this case the earnings of the Norbury line for the week averaged 13.52d.; and the traffic, 9.6 passengers per car-mile. For the system as a whole the summer figures were 20.36d. and 13.55 passengers per car-mile, as contrasted with 14.03d. and 10.59 passengers per car-mile in January. Yet it will be admitted that the winter figures alone show respectable business! The exceptional position of the 1½-mile Addiscombe line has previously been discussed.

A banner day, demonstrating that somehow the conductors do get the money for their employer under the zone system, is afforded by the record of Whitsuntide, May 20, 1918, when £1,002 were collected from 118,754 passengers. As the total car-miles operated that day were 8,057, the number of passengers per car-mile amounted to 14.7 and the earnings per car-mile, 2s. 5.87d., or 59 cents.

For the year ended March 31, 1918, the average num-

GEORGE STREET, ONE OF CROYDON'S BIG SHOPPING THOROUGHFARES



CLIMBING A HILL ON BUSY HIGH STREET—NOTE THE TROLLEY OFFSET

ber of passengers per car-mile was 10.34; the average fare paid per passenger, 1.15d., and the average returns per car-mile, 11.95d. This was on the basis of 1.69 miles average distance for a penny, 2.29 miles for 2d. and 3.44 miles for 3d. These distances have since been decreased an average of 30 per cent.

TICKETS, INCLUDING UN-AMERICAN TRANSFERS

The ordinary rate tickets of the Croydon Corporation Tramways are of the usual kind, bearing identification numbers, names of stages, etc. In order to save paper, the ordinary rate 3d. and 4d. tickets are available either on the Norbury line or on the line to Penge reached via the South Metropolitan Tramways. Ordinary 1d. and 2d. through tickets are also issued jointly by the two undertakings between stages on the sections of the Penge line owned by each one. Earnings from these through tickets are divided equally, and then the Croydon Corporation Tramways gives 5d. to the South Metropolitan for the excess car-miles run by that undertaking as an allowance for everything except power, overhead line and permanent way.

In addition to the through tickets named, there is a two-part ticket sold at 4d. which gives the passenger the right to continue the journey from High Level, Crystal Palace, on to London by bus. This ticket, after being punched, is retained by the passenger as long as he is on the first car. When he reaches the "Robin Hood," the point of transfer to High Level, he surrenders the serially numbered top coupon to the conductor of the second car. On reaching High Level, he surrenders the rest of this ticket for an exchange ticket. This last type of bus-car ticket will be described in a later article on the London General Omnibus Company's practices.

There are no special low-rate tickets for children, but the workmen's rate still lives. Workmen's return

TABLE II—FARE REVISIONS OF THE CROYDON CORPORATION TRAMWAYS, AUG. 1, 1916

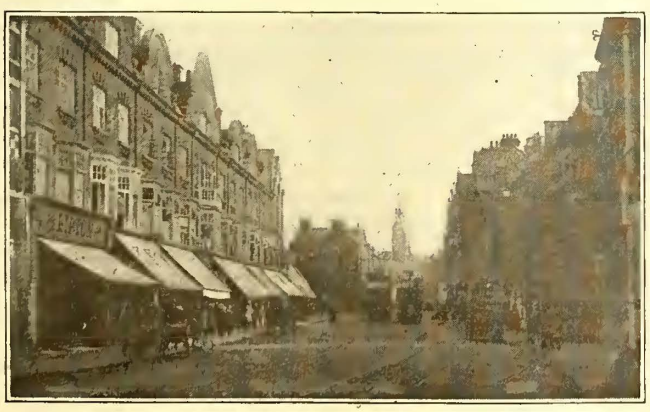
		Per Cent of Increase
From an average of 2 miles, 870 ft. for 1d. to 1 mile	4280 ft.	19.56
From an average of 1 mile, 4719 ft. for 1d. transfer to 1 mile	1084 ft.	18.87
From an average of 2 miles, 4218 ft. for 1½d. to 2 miles	1773 ft.	18.52
From an average of 2 miles, 4773 ft. for 1½d. transfer to 2 miles	1095 ft.	33.33
From an average of 4 miles, 1890 ft. for 2d. to 3 miles	2544 ft.	23.91
From an average of — for 2d. transfer to 3 miles	2175 ft.	.....
From an average of 5 miles, 429 ft. for 2½d. to 4 miles	630 ft.	16.33
From an average of 5 miles, 3960 ft. for 3d. to 5 miles	3030 ft.	3.85
From an average of 2 miles, 4386 ft. for 1d. workman to 2 miles	2064 ft.	20.00
From an average of — for 1½d. workman to 2 miles	4620 ft.	.....
From an average of — for 2½d. workman to 5 miles	3030 ft.	.....
From an average of 5 miles, 3240 ft. for 2d. return		.....
May 1, 1918		
From an average of 1 mile, 4280 ft. for 1d. to 1 mile	1935 ft.	24.28
From an average of 1 mile, 1084 ft. for 1d. transfer to 1 mile	783 ft.	27.51
From an average of 3 miles, 2544 ft. for 2d. to 2 miles	3804 ft.	21.86
From an average of 3 miles 2175 ft. for 2d. transfer to 2 miles	3120 ft.	24.06
From an average of 5 miles, 3030 ft. for 3d. to 4 miles	780 ft.	25.58

TABLE III—CROYDON PASSENGERS AT VARIOUS RATES OF FARE FOR YEARS ENDED MARCH 31, 1916–1918

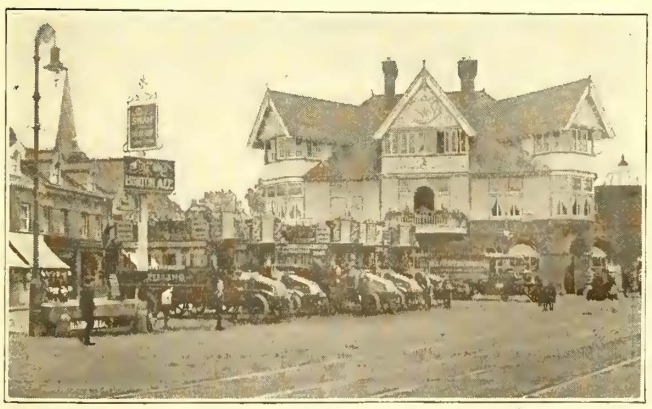
Fare, d.	1916 Passengers, Number	1916 Per Cent	1917 Passengers, Number	1917 Per Cent	1918 Passengers, Number	1918 Per Cent
1	18,412,490	88.0	15,297,110	81.0	17,109,479	75.0
1½	1,350,224	6.0	2,354,967	12.0	3,498,773	15.0
2	983,893	4.7	1,042,391	5.3	1,491,380	6.96
2½	93,902	0.4	126,662	0.7	230,337	1.0
3	189,566	0.9	229,277	1.0	407,832	2.0
4	.....	.....	.....	.....	9,439	0.04
	21,030,075	100.0	19,050,407	100.0	22,747,240	100.0

TABLE IV—COMPARATIVE TRAVEL IN CROYDON IN MAY, 1916–1918

Year	Month	Total Passengers
1916	May	1,416,840
1917	May	2,056,322
1918	May	1,950,041



CROYDON LOCAL SHOPS REACHED FOR A PENNY FARE



AT THE "SWAN AND SUGAR LOAF" IN CROYDON—NOTE THE FLEET OF BUSES

CROYDON CORPORATION TRAMWAYS.

Ticket and Punch Receipt.

.....Depôt. Date.....191

Number of Boxes..... .....Ticket Clerk.

Box No.	Punch Record. Number	Register In.	Tickets Issued	Over.	Under.	Quantity of Tickets in Box. Corporation. 1d.	1d T.	2d	2d T.	2d W R	4d W R	1d Ex.	2d Ex.	Theirton. 1d.	2d	3d.	4d	Company. 1d.	2d.	4d (Rest)	Transfers Returned. Corporation. 1d.	2d	W R	Company. 1d.	2d	Box No.	Conductor's Signature

Errors must be checked and certified by the Inspector before the Conductor leaves the Office in the morning, otherwise they will not be credited.
The Conductor will be held responsible for every Ticket issued with the Box, and any not sold or returned will be charged for the same as if sold.
The Depot Inspector must forward this Sheet to Head Office after all Signatures have been obtained.

T. B. GOODYER,
Tramways Manager

SUMMARY OF PUNCH AND TICKETS—RECEIPTS SIGNED BY CONDUCTORS

tickets for rides on four cars are issued in two denominations, 2d. and 4d. This ticket has three coupons, each bearing the serial number of the ticket and a numeral to show the order of use, as illustrated. When the passenger presents the ticket for the first half of the first journey, the conductor punches the destination on the light or a.m. side, as in the case of an ordinary one-way ticket. When the workman boards the second car, the same stage is punched again on the same side, but this second conductor takes off the bottom coupon as the equivalent of the registration counted by his punch

Crown Hill and Addiscombe Route.

SUMMARY OF TICKETS sent out with this Way Bill, and the value of those not returned

..... BOX

Letter	Fare.	Tickets issued with Way Bill. Closing No.	Opening No.	Opening No. of Tickets Returned	Difference No.	Value. £	s.	d.	Quantity of Tickets in Box.	REMARKS.
	1d	99								
	1d T	99								
	1½d T	99								
	2d T	99								
	1d Ex	99								
	1½d Ex	99								
	2d Ex	99								

PUNCH No. TOTALS

REGISTER IN *Less* Official Passes

OVER. UNDER NET TOTALS

The space above this line is for Office use only

AMOUNT PAID IN BY CONDUCTOR

	£	s.	d.
20/ NOTES			
10/ "			
SILVER			
COPPER			
Value of 1d. Departmental Tickets			
Value of 1½d. " "			
Official Passes			
Total £			

No. of 1d. Transfer Tickets returned

" " 1½d. Transfer Tickets "

" " 2d. " " "

EMPLOYEES CAP Nos.

Journey No.	Journey To.	Motormen	Conductors

Paid in by.....*Conductor*

Received by.....

Date.....19.....

Motorman's Name.....

Service.....

Car Nos......

NOTE.—If you have carried out your duties properly the amount of Cash paid in will correspond with the value of Tickets sold.

CONDUCTOR'S WAYBILL MADE FOR A SPECIFIC ROUTE IN CROYDON

and he makes due entry of the coupon on his waybill. When the passenger presents the rest of the ticket on the first car homeward in the afternoon, the third conductor removes the coupon marked "3" and enters it on his waybill after having punched the destination on the dark or "p.m." side of the ticket. The fourth conductor punches the same side and removes coupon "4" to square his count. What is left is the passenger's standard fare receipt. Naturally, the serial number on the ticket is good as a check only on the first car of the day, but it does not pay to put day and time limits on a ticket of this character. The same ticket may be used as a two-car ticket, in which event no coupon is removed by the morning conductor, but all are taken off by the afternoon conductor. This multi-coupon ticket was gotten out as a special concession to war workers, and the railway hopes to do away with it at an early date. In no case are the return-ride privileges available on holidays.

All workmen's tickets must be sold no later than 7.30 a.m. The ordinary 1d. ticket with special extensions of ride is available in the case of workmen's one-way trips in the morning.

It is now in order to explain the use of transfers for the ordinary-rate passenger. These are not transfers in the usual American sense of fare receipts giving the passenger an extension of his journey on a second car with no increase in fare. The simplest way to express the idea of what is accomplished by a Croydon transfer is to say that it sells two ½-d. rides for 1d., two 1d.-rides for 2d., and so on, wherever it would be unwise to attempt to sell the rides separately because the distance would be so short as to make it seem to the passenger hardly worth while to board the second car. The prospective passenger is led to think of his trip as a unit even though he has to use two cars to make the journey. Instead of receiving more for his money, however, the transfer passenger in actual practice gets a little less. Another advantage of the transfer is that it keeps a certain number of people who live on the branch lines from patronizing the buses because once they buy a through ticket they use it on both the branch and the main-line cars. Passengers who purchase a transfer ticket give it up for an exchange ticket on boarding the second car, the second conductor punching the same stage on the exchange ticket as the one he observes on the transfer ticket. As soon as possible, however, the exchange ticket will be abolished in favor of the plan of having the second conductor cancel the transfer against further use by means of a non-registering punch.

At one time an effort was made to place a limit of at least one day on the transfer ticket by using code letters. The complications thus involved did not prove justified, especially in view of the fact that the transfer was not a free privilege in the American sense but something that was paid for. The 1d. and 2d. transfer tickets of the South Metropolitan Tramway system, however, still carry such markings. In the case of the 2d. coupon transfer used within that company's area, the first conductor punches the letter selected for the day; the second conductor punches the time nearest to the receipt of the ticket and retains the serially-numbered top coupon as an accounting for the registration of his punch.

In addition to relying upon seven ticket inspectors (one of them a woman) for the proper issuance and use of tickets, the management has the conductors examine tickets at the end of every fare stage as a check against over-riding. The latter rule, of course, simply takes advantage of the fact that the conductors at Croydon are ordinarily not kept too occupied to do this. Placards for passengers as posted in the cars cover three important points in connection with the fare system: Rates of fare, a suggestion that upper-deck passengers pay on the platform, and a warning as to the statutory penalty for failure to pay proper fare.

To conclude the discussion relative to tickets, it may be of interest to mention the departmental tickets bought at full face value by different departments of the municipality. Each token, which is exchangeable for a standard ticket on the car, is marked with the initials of the department which uses them, as "T. C." for town clerk, "B. E." for borough engineer, "E. L. D." for electric light department, "R. S." for road surveyor, "F. C." for food controller (of blessed memory), etc. Those tickets which are good for use after office hours are surprinted "A. O. H." The departments interested receive regular statements, as shown, of the tickets used by them. One of the advantages of supplying the

506
500/4/18

CROYDON CORPORATION TRAMWAYS.

Particulars of Through and Company Tickets issued 19

Class of Ticket.	Total Issued. No.	Total Issued. Value.	Corporation's Proportion. Rate.	Corporation's Proportion. Amount.	Company's Proportion. Rate.	Company's Proportion. Amount.
1d Thro Buff			½d		½d	
2d. „ Blue & White			½d		1½d.	
3d. „ Yellow ...			2d		1d	
4d. „ Green ...			2d		2d.	
1d, S.M.E.T. ...					1d	
1d. T. „ ...					1d.	
2d T. „ ...					2d	
4d. Bus					4d.	
Corporation Totals						
Add Company's „						
Net Result for Day						

Balance due to ... for Day £ : :

Excess Miles run by Company's Cars.

TRAMWAYS MANAGER.

Checked by. ... *Chief Clerk.*

DAILY SUMMARY OF TICKETS ISSUED

employees with tokens instead of cash is that they are no longer tempted to use their employer's competitor—the motor-bus.

The Ticket Department

Although tickets are supplied from a common stock, they are issued according to continuous serial numbers, and the conductors must always work off their own remainders. The ticket department and not the conductor estimates the quantity of each kind required. The department records on the waybill the initials, the opening and the closing numbers, the quantity, etc. The

373
500.11/18

CROYDON CORPORATION TRAMWAYS.

To W. GUNNER, Esq.,
Borough Treasurer,
Town Hall, Croydon.

Tramways Offices,
Thornton Heath,
Surrey, ... 191...

Dear Sir,

DEPARTMENTAL STAFF TICKETS.

I now send you the following particulars relating to the above for the week ending

Friday ... day of ... 191

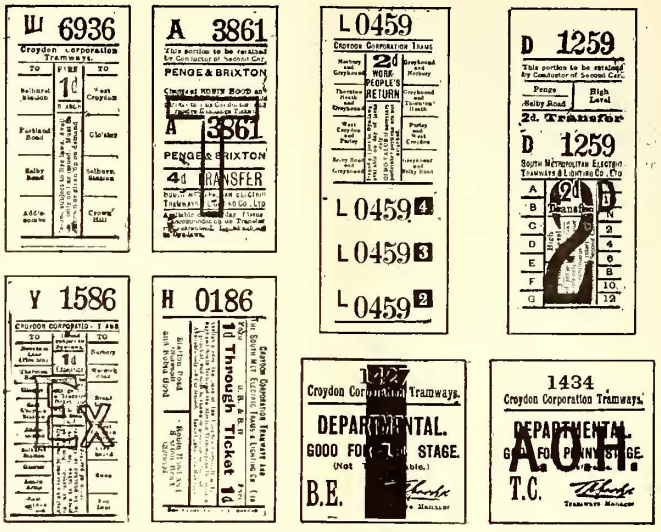
Yours faithfully,

Tramways Manager.

Department.	Number Used. Saturday 1d.	Saturday 1½d.	Sunday 1d.	Sunday 1½d.	Monday 1d.	Monday 1½d.	Tuesday. 1d.	Tuesday. 1½d.	Wednesday 1d.	Wednesday 1½d.	Thursday. 1d.	Thursday. 1½d.	Friday. 1d.	Friday. 1½d.	Totals for Week. 1d.	Totals for Week. 1½d.	Totals for Week. Value.	Totals to Date. 1d.	Totals to Date. 1½d.	Totals to Date. Value.
Town Clerk's																				
Borough Treasurer's ..																				
Borough Engineer's ...																				
Borough Road Surveyor's																				
Public Health																				
Electricity																				
Education																				
Rate Collector's																				
Weights and Measures ...																				
TOTALS ...																				

WEEKLY SUMMARY OF TICKETS ISSUED FOR ACCOUNT OF OTHER MUNICIPAL DEPARTMENTS

conductor puts down the opening or top numbers of the tickets returned and fills in on the bottom of the waybill the data concerning money and tickets returned. Cash and tokens are turned in by the conductors to the receiver stationed from afternoon to midnight at each of the two depots. These receivers sign for the value received and bank the money without having it go to the ticket department. The inner side of the waybill prepared for each route is arranged to show the ticket numbering at various points along the route. Obviously a report like this is not accurate enough for the busy hours, but it is helpful to the ticket inspector in conducting his check.



SOME VARIETIES OF CROYDON TICKETS, INCLUDING TRANSFERS, INTERCHANGE TICKETS AND MUNICIPAL EMPLOYEES' TICKETS

The registering punch used is made by the Bell Punch & Ticket Company. Few counts of the punchings are required either through inaccurate returns or out-of-order punches. Hardly more than one count a day is made with eighty to ninety conductors in service. With regard to the check on the cars, it may be said that although the ticket inspectors have other traffic duties, they average sixty to seventy checks a day.

Several forms used by the ticket department are reproduced herewith, such as the waybill, the statement of departmental tickets, the summary of receipts for tickets and punches given to the individual conductors, and the daily summary of cash and tickets. Neither the three employees who prepare traffic summaries nor the cash receivers are charged against the ticket system, as they would be needed anyway. The ticket department itself has but four employees—namely, the chief clerk, two boys who make out the waybills, and one boy who empties and resets the punches. That the Croydon Corporation Tramways should have such good traffic as described earlier in this article is all the more extraordinary in view of the powerful competition of the motor bus, particularly on the Norbury main line. This line would probably enjoy 30 per cent more traffic if the buses were absent. It has to compete with three bus routes over its full length in addition to other buses which go over the same route from West Croydon station and Crown Hill to the "Red Deer." For example, on Sunday, March 2, 112 buses were operating as compared to fifty cars.

In view of the many pros and cons on this subject, it may be of value to set forth some of the reasons why the bus has proved so dangerous a competitor. Mr. Goodyer has given much thought to this subject, and while the following figures from two of his reports (1913 and 1914) may not be correct to-day, the comparison of burdens still holds good.

COMPARISON OF PUBLIC BURDENS BORNE ANNUALLY BY TRAMCARS AND MOTOR BUSES AT CROYDON

Items	Car £	s.	d.	Motor Bus £	s.	d.
License duties	2	15	0	5	18	0
Taxes on track	43	8	9	..	..	.
Maintenance of road	92	11	9	..	..	.
Petrol tax	..	..	.	43	0	0
	138	15	6	48	18	0

"Croydon is Goodyer and Goodyer is Croydon" would be one way of expressing the state of affairs at Croydon. Since December, 1901, THOMAS BOYCE GOODYER has been the tramway executive in that city, first as general manager for the British Electric Traction Company, Ltd., when it was lessee of the Croydon Corporation Tramways; then from the termination of the lease in May, 1906, as tramways manager for the municipality.

Continuity in office under such radical change in control indicates that Mr. Goodyer must have achieved that object so difficult for an electric railway manager—popularity. Indeed, one does not have to spend many hours with him to learn that the general public want to lay their troubles before him only. He would no more allow a complainant to leave unsatisfied than a good salesman would allow a prospect to get out of the shop without buying. A community like Croydon, where so much of the traffic comes from women shoppers, needs and gets this personal cultivation. Mr. Goodyer's popularity is equally great among his fellow managers, as instanced by his election last year to the presidency of the Municipal Tramways Association. This honor he fully deserved for the hearty, hustling way in which he throws himself into any matters of general welfare to the industry.

Mr. Goodyer's birthplace was Glasgow, but he was educated at the Royal High School, Edinburgh. On leaving school he spent several years with D. W. Paterson, solicitor, and for many years secretary of the Edinburgh Street Tramways, of which Mr. Goodyer's father was traffic manager. In 1884, Mr. Goodyer joined the traffic office staff of the London Road Car Company, Ltd., and some months later became manager and secretary of the Northampton Street Tramways. His next appointment was that of manager of the West Metropolitan Tramways, part of which is now the London United Tramways. In October, 1887, he resigned to become assistant traffic manager of the Birmingham Central Tramways, which kept him busy with horse cars, cable cars, accumulator cars, steam cars and omnibuses! In 1894 he was appointed traffic manager. In 1896 a new company called the City of Birmingham Tramways was formed to take over and operate the Birmingham Central. Mr. Goodyer remained with the new company until April, 1898, when he resigned to become the general traffic superintendent of the British Electric Traction Company, Ltd., when that great concern was operating several score properties, aggregating many miles of electric, steam and horse lines. During 1900 he spent several months in the United States and Canada to get a first-hand view of American practices. When the office of general traffic superintendent was abolished in December, 1901, Mr. Goodyer was appointed general manager at Croydon as noted above.

Mr. Goodyer has been a member of the executive council of the Municipal Tramways Association for several years and is also a member of the council of the Tramways and Light Railways Association, which is composed of privately-owned undertakings. Since 1907 he has been honorary secretary to the Metropolitan Association of Electric Tramways Managers, and he has also acted in a similar capacity to the tramways (Board of Trade) local advisory committee for No. 1 area, Metropolitan and East Coast.

TABLE V—TRAFFIC RETURNS IN CROYDON FOR WEEK ENDED AUG. 16, 1918

	Norbury					Thornton Heath					Norwood					Addiscombe					Totals				
	Cars	Car-Miles	£	Pence per Car-Mile	Passengers	Passengers per Car-Mile	Cars	Car-Miles	£	Pence per Car-Mile	Passengers	Passengers per Car-Mile	Cars	Car-Miles	£	Pence per Car-Mile	Passengers	Passengers per Car-Mile	Cars	Car-Miles	£	Pence per Car-Mile	Passengers	Passengers per Car-Mile
Saturday	26	2,888	277	23.10	39,348	13.62	22	1,960	158	19.40	24,868	12.69	9	1,299	114	21.13	13,323	15.25	10	777	72	22.27	17,164	22.09	67	6,952	625	21.58	101,208	14.56
Sunday	23	2,260	255	27.13	30,417	13.45	16	1,390	131	22.68	18,133	13.05	7	938	79	24.33	13,253	14.14	7	503	37	17.79	8,859	17.46	53	5,096	504	23.75	70,678	13.87
Monday	26	2,630	238	21.75	34,248	13.02	8	882	72	19.62	12,055	13.67	7	1,048	82	18.19	14,437	13.75	8	651	52	19.18	12,263	18.84	49	5,211	444	20.49	72,973	14.00
Tuesday	25	2,632	228	20.80	33,233	12.62	8	882	66	18.12	11,012	12.49	7	1,048	76	17.55	13,531	12.96	8	651	49	18.16	11,691	17.96	48	5,213	420	19.36	69,517	13.34
Wednesday	25	2,626	247	22.59	34,425	13.11	8	882	68	18.72	11,543	13.09	7	1,036	76	17.72	13,430	12.96	8	651	45	16.90	10,889	16.73	48	5,320	445	20.10	70,287	13.21
Thursday	25	2,632	242	22.09	35,184	13.37	8	882	67	18.33	11,294	12.80	7	1,043	77	17.89	13,590	13.03	8	651	49	18.25	11,737	18.03	48	5,438	449	19.83	71,805	13.20
Friday	26	2,680	195	17.51	30,472	11.37	8	883	64	17.60	10,855	12.29	7	1,048	67	15.38	12,369	11.80	8	651	48	17.92	11,559	17.76	49	5,262	376	17.15	65,255	12.40
Total	25	18,348	1,684	22.04	237,327	12.93	11	7,761	629	19.46	99,760	12.85	7	7,460	574	18.49	100,464	13.47	8	4,540	355	18.44	84,172	18.54	52	38,492	3,266	20.36	521,723	13.55

TABLE VI—TRAFFIC RETURNS IN CROYDON FOR WEEK ENDED JAN. 31, 1919

	Norbury					Thornton Heath					Norwood					Addiscombe					Total				
	Cars	Car-Miles	£	Pence per Car-Mile	Passengers	Passengers per Car-Mile	Cars	Car-Miles	£	Pence per Car-Mile	Passengers	Passengers per Car-Mile	Cars	Car-Miles	£	Pence per Car-Miles	Passengers	Passengers per Car-Mile	Cars	Car-Miles	£	Pence per Car-Mile	Passengers	Passengers per Car-Mile
Saturday	25	2,724	195	17.16	32,838	12.06	24	2,088	141	16.21	22,983	11.01	9	1,251	106	20.36	18,617	14.88	10	810	71	21.01	16,944	20.92	68	6,873	513	17.91	91,382	13.30
Sunday	20	2,013	10	12.01	16,091	7.99	16	1,666	68	9.85	11,248	6.75	7	868	47	13.12	8,458	9.70	7	514	27	12.65	6,415	12.48	50	5,061	244	11.55	42,212	8.34
Monday	20	2,495	146	14.09	25,219	10.11	17	1,668	95	13.59	15,829	9.49	8	1,103	68	14.90	12,624	11.45	9	706	46	16.72	10,966	16.56	52	5,924	333	13.84	61,134	10.32
Tuesday	20	2,514	134	12.81	23,193	9.23	17	1,660	90	13.07	15,245	9.18	7	1,088	63	13.84	11,730	10.78	8	662	46	16.57	10,974	16.40	54	6,012	329	13.15	60,445	10.05
Wednesday	20	2,513	134	12.80	22,980	9.14	18	1,763	90	12.29	15,280	8.67	8	1,067	59	13.26	11,211	10.51	8	669	46	16.72	11,086	16.72	52	5,860	346	14.18	62,789	10.71
Thursday	20	2,518	143	13.67	24,447	9.71	16	1,565	91	13.88	15,140	9.67	8	1,114	66	13.82	12,116	10.88	8	663	46	16.85	11,036	16.72	52	5,951	311	12.55	57,721	9.70
Friday	20	2,490	119	11.50	20,869	8.38	17	1,682	90	12.86	15,192	9.03	7	1,061	55	12.52	10,600	9.99	8	718	46	15.52	11,060	15.40	52					
Total	21	17,267	972	13.52	165,637	9.60	18	12,092	665	13.20	110,917	9.17	8	7,552	464	14.79	85,356	11.30	8	4,742	332	16.85	79,282	16.72	55	41,653	2,435	14.03	441,192	10.59

In addition to the foregoing items, the Croydon cars for the preceding year had contributed an average of £51 14s. 6d. each toward the taxes, thus giving a sum of £190 10s. per annum per car run or a gross total of £11,095 16s. 7d. as a contribution to the local revenue.

After pointing out that most of the wages earned by the Croydon Tramway employees were spent in the community, Mr. Goodyer showed the following:

HOW TRAMCARS IN THE METROPOLITAN AREA ARE HANDICAPPED IN COMPARISON WITH MOTOR BUSES

	Tramcars	Motor Buses
Control	Permitted to run only on routes sanctioned by Parliament	Free to go anywhere at their option
Track	Provided and maintained by the tramway system. Damage done by motor buses and other traffic repaired at cost of trams.	Provided and maintained from taxes. Repairs paid for by the general taxpayer.
Workpeople's Fares	On all routes	None
Tax on track	Tax paid on track	None

In concluding his 1913 report, Mr. Goodyer quoted a former official of the Board of Trade who stated in a report on "Means of Locomotion and Transport in the Metropolitan Area": "Where the streets have ample width and the conditions are otherwise favorable, the tramway has no rival for the safe, convenient and cheap transport of large numbers of people."

TWO IMPORTANT CAR CARDS USED IN CROYDON

In his report of June, 1914, Mr. Goodyer again directed attention to the depredations of the bus and quoted verbatim testimony which showed how destructive the bus was proving to the roadways of London, in one case the cost of maintenance having doubled. The report stated that following the initiative of Croydon, the communities of East Ham, West Ham, Leyton, Bexley and Walthamstow had passed resolutions to be submitted to the Prime Minister and the President of the Board of Trade recommending legislation that would place motor omnibus companies on terms of equality in regard to public obligations with the municipal tramway authorities in the metropolitan area.

In connection with evidence presented before the select committee on motor traffic in 1913, it had been stated that if the London motor omnibus proprietors had to pay a contribution towards track and road maintenance, and a tax on the track, equivalent to what the London County Council Tramways had to pay (£200 per vehicle), it would amount to about £600,000 per annum. It was asserted that the existing conditions were manifestly and monstrously unfair.

The work of impressing such facts upon the government, so as to secure remedial legislation, was interrupted by the war. Efforts are now being made, however, to bring the subject to the attention of Parliament.

European Electrification Proposals

British Plans in Abeyance, Pending Government Action — France Has Commission at Work — Belgium Has Approved Several Undertakings

BY ALEXANDER MCCALLUM
London

THE subject of electrification of steam railways is engaging earnest attention at present in Great Britain, France and Belgium. In the first of these countries, however, nothing can be done pending the passing of legislation now before Parliament. In France the subject is complicated by its forming part of a gigantic scheme of national reconstruction. In Belgium only does it seem likely that a very early start will be made.

GREAT BRITAIN

The conversion to electric traction of steam railways in England and Scotland where such a course seems advisable, is a part of the policy of the present British government. There is, however, no prospect of anything definite being done until two bills now before Parliament have been passed and until the administrative machinery which they set up has been got into working order. These measures are the Ministry of Ways and Communications bill and the electricity supply bill. As most readers no doubt know the former creates a ministry which will have charge of all means of public locomotion and the latter establishes a national electric supply which will also be under the supervision of the new ministry. The ways and communications bill is now being discussed by the House of Lords, many of the members of which show a hostile spirit to it and it is not at all certain that there will not be a conflict between the Lords and the House of Commons on the subject. The electricity bill as yet has not got beyond the House of Commons and it also is meeting with much criticism. In the end of July the government adopted an important amendment under which railway companies' existing generating stations will be exempted from the general transfer of power stations to the national scheme.

British railway companies, in the meantime, will do nothing to inaugurate electrification. They are and will be for two years under government control and at the end of that period no one knows what will happen. That is to be decided in the interval by the new minister. Hence no avoidable capital expenditure will be undertaken by the companies. But if the two bills are passed without substantial wreck, the minister is expected, in collaboration with the companies, to inaugurate electrification. No definite plans have yet been formulated; in fact, the heads of departments who have been provisionally nominated for the ministry do not really exist as such until the bills have been passed. An early scheme will no doubt be the electrification of the main line from London to Southend, a distance of about 40 miles, for which Parliamentary powers already exist. Another definite plan will be the conversion of the South Eastern Railway from London to Dover, more than 70 miles, provided that the Channel tunnel scheme goes forward as it promises to do. The French authorities have just approved it. As for the rest, the prospect seems to be one of suburban electrification gradually carried further and further out from the great cities, and in some cases at least ultimately meeting and joining up. Under the electricity supply bill £20,000,000 is provided for the erection of super-power stations and main transmission lines to be used for all power purposes, and £25,000,000 is allotted for financing the proposed district electricity boards and joint electricity authorities who are to take over existing generating stations and main transmission lines and work them into the scheme of great new stations to form a national system.

As to the method of traction which will be employed, there can hardly be a doubt that in very many cases at least it will be the direct-current system, though nothing has been formally decided. Apart from a short local line at Morecambe in Lancashire, the only example of single-phase system of traction in Britain is that on the suburban lines of the London, Brighton and South Coast Railway. Though this has been in highly successful operation for several years, the steam railway electrifications which succeeded it like those which came before it have all been direct current.

FRANCE

Nothing very definite has emerged in France. An elaborate report by the Higher Council of Public Works was issued last spring dealing with many subjects besides railway electrification. Numerous committees are carrying on investigation on a variety of subjects and one of them, as already reported in this journal, has been investigating electric railways in the United States. The conversion of thousands of miles of main-line railways in France is contemplated, but according to the latest information no definite steps have yet been taken.

BELGIUM

It is different in Belgium, despite the way in which that country has been ravaged by the war. The Belgian government has had several reports with regard to power distribution. Though interrupted by the war a commission has long existed for the study of the electrification of the Belgian State Railways. In the early part of this summer the Belgian government approved a report by this commission in favor of carrying out the change. Four experts were appointed to work on the subject, and it is expected that the railways first to be dealt with will be those from Brussels to Antwerp, Brussels to Luxembourg and Brussels to Ostend. There is talk of the work of conversion being begun next year. Direct-current traction is to be employed at 2400 volts and either third-rail or overhead conductors will be used, according to circumstances. A very frequent service of trains is contemplated.

In connection with the Eighth Annual Safety Congress which is to be held in Cleveland Oct. 1 to 4 inclusive, the safety exhibit will be held in Grays' Armory. The entire space has been contracted for, and there will be seventy booths in which will be shown types of safety equipment applicable to every industry. A feature which will be of particular interest to electric railway men will be a shop-lighting exhibit to be conducted by the National Lamp Works, to which has been assigned the entire stage of the armory. A shop will be shown in operation, with three lighting installations varying in quality from the point of view of safety engineering.

Progress on the Midi Railway Pyrenean Electrification*

An Ultimate Electrical Mileage of More than 500 Is Involved in This Important Development, Which Was Greatly Hampered by the War

BY LUCIEN A. H. PAHIN
Pontoise, France

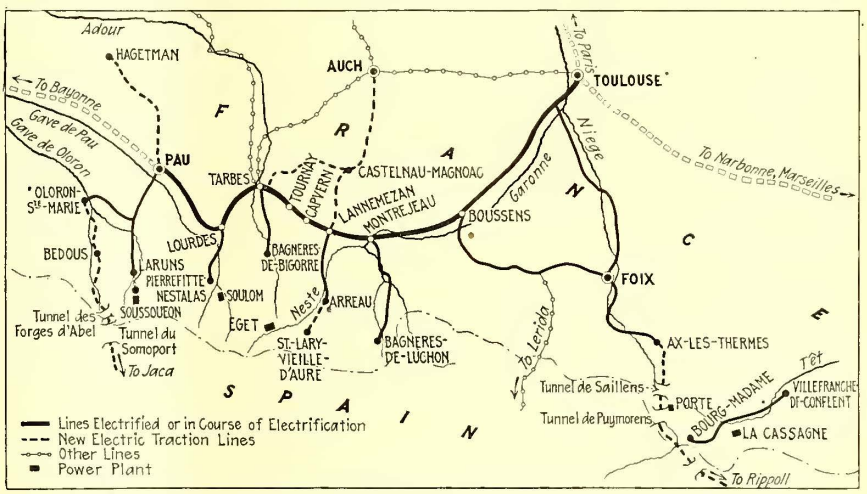
FOLLOWING the negotiations which resulted in the concession making possible the railway line across the Pyrenees Mountains, the Midi (Southern) Railway in France undertook, in 1905 and 1906, the preparation of electrification projects of which a part are now completed. Electrical operation was decided upon because many of the grades involved would have been insurmountable by steam locomotives. While the new lines were being developed, in order to insure the most rational development of the main line between Toulouse and Bayonne (on the Atlantic coast) and its branches, it was decided to substitute electric traction for steam on a number of lines of the system already in operation.

On the accompanying map may be seen the following lines or sections of lines which have been electrified up to the present time: (1) Foix to Ax-les-Thermes and to the Spanish frontier, 50½ miles, the French part of the Trans-Pyrenean line from Ax-les-Thermes (France) to Ripoll (Spain). (2) Montréjeau to Pau, 70 miles, a section of the line between Toulouse and Bayonne. (3) Montréjeau to Bagnéres-de-Luchon, 22 miles. (4) Lannemezan to Arreau, 15½ miles. (5) Tarbes to Bagnères-de-Bigorre, 13½ miles. (6) Lourdes to Pierrefitte-Nestalas, 13 miles. (7) Pau to Oloren—Ste. Marie and to Laruns-Eaux-Bonnes, 34 miles. (8) Auch to Lannemezan, 43½ miles. (9) Arreau to Saint-Lary and Vieille-d'Aure, 7 miles. (10) Pau to Hagetman, 33 miles. (11) Oloron-Ste. Marie to Bedous and the Spanish frontier, 32½ miles, the French part of the line across the Pyrenees between Bedous and Jaca.

The sections next to be completed will be those from Montréjeau to Toulouse, 64½ miles; from Toulouse to Foix, 52 miles, and from Boussens to Foix, 50 miles. Most of these lines contain grades up to 4½ per cent.

All of the above track is standard gage. The lines, however, connect with two of meter gage (3 ft. 3.4 in.), that between Villefranche-de-Conflenz and Bourg-Madame, and that between Castlenau-Magnoac and Tarbes.

The Midi Company adopted for power supply to the trains single-phase current at 12,000 volts, distributed over an aerial line with catenary suspension.



MAP OF PYRENEAN SYSTEM OF MIDI RAILWAY, SHOWING ELECTRIFICATION PROGRESS

On the important lines the passenger and freight trains will be drawn by electric locomotives equipped with motors of 600 hp. or the equivalent, and weighing about 88 tons (2000 lb.) of which 59 tons is carried by the three driving axles.†

The type of chassis of the locomotive, number of axles, wheel arrangement, etc., were specified by the railway company. As was covered in the technical press before the war, the railway company and the manufacturers were at the time studying carefully the details of electrical equipment best fitted for the operating program prescribed by the railway, but necessarily the tests which were then under way were interfered with by the beginning of hostilities.

On the branch lines, as well as for the local trains on the Toulouse-Bayonne line, the railway expects to use single-phase, multiple-unit cars equipped each with four 125-hp., 285-volt, 15-cycle motors. These coaches, of which a number are to be furnished by the French Westinghouse Company, will weigh about 61½ tons.

As a whole the work undertaken by the Midi Company, in co-operation with the government, for the electrification of the Pyrenees system involves nearly 530 miles of route. The undertaking may be considered, in magnitude, as one of the most important in Europe.

The results obtained to date on the electrified parts of the system are excellent, but actual operating data are not yet available because since 1914 the train service given on all of the French lines has been quite abnormal. Furthermore, the power plants of the Midi Company have furnished electric power to various factories working for the national defense, hence they

*For more detail regarding the pre-war status of this electrification see ELECTRIC RAILWAY JOURNAL, Feb. 15, 1913, page 288; May 3, 1913, page 792; June 14, 1913, page 1067; June 3, 1916, page 1040.

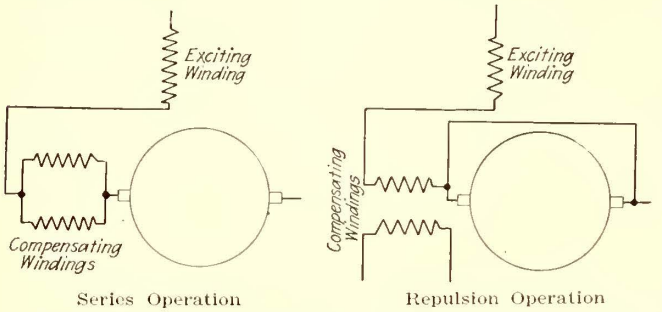
†NOTE.—We assume that the power capacity of the locomotive is subject to modification in the light of the experience now being had with the electric locomotives which are in service.—EDS.

have operated under conditions different from those normal in a railway power plant. Later it will be possible to obtain data of value regarding regular operation, and as a result of the tests which were interrupted, or at least disturbed, by the outbreak of hostilities on Aug. 1, 1914.

The electric power supply for the Midi system involves a number of plants, principally of the hydraulic type. The Pyrenean region abounds in water powers of high heads, well located for the purposes of the railway system. Some detail of the principal hydro-electric plants will be given in a later article.

The Three Types of Locomotive Now in Trial Use

Readers of this paper will remember that preliminary tests of six types of locomotives were held by the Midi Company near Villefranche in 1911 and 1912. As a result three types were selected as satisfactory, and machines of these types have been in service during the war period. In view of the importance of these



SCHEMATIC DIAGRAM OF SERIES COMPENSATED MOTOR CONNECTIONS FOR MIDI RAILWAY LOCOMOTIVE

service trials it will be well to review briefly the principle characteristics of the locomotives.

The locomotives now in use were purchased from three companies, which for brevity may be termed the Jeumont, the French Thomson-Houston, and the French Westinghouse companies respectively. The characteristics of their machines are detailed briefly in Table I. All of the locomotives have the 2-6-2 wheel arrangement, but differ in method of connecting the driving wheels and motors, and in other details.

The Jeumont drive involves three 400-hp. motors geared to the driving axles through flexibly-mounted quills. This drive was described and illustrated in the issue of the ELECTRIC RAILWAY JOURNAL of Feb. 15, 1913. The Thomson-Houston locomotive contains two 600-hp. slow-speed motors. Each drives a jackshaft through cranks, and the jackshaft cranks are connected at the ends of the connecting rods which also tie the three driving axles together.

In the Westinghouse machine each of the two 600-hp. motors drive a jackshaft through gearing, and the two jackshafts are crank-connected to the connecting rods which join the drivers. The Thomson-Houston and Westinghouse drives were shown in detail in the issue of this paper for May 3, 1913.

The program of operation laid down by the railway specified that the locomotive should be capable of drawing a 440-ton train up a 1.7-per cent. grade, and of attaining a minimum speed of 25 m.p.h. with a 308-ton train and of 37 m.p.h. with a 110-ton train.

In descending a grade the motors were required to act as generators, returning power to the line, and the speed in descending a grade was to be capable of control from that fixed by the ascent of this grade to one-half of this speed.

TABLE I—CHARACTERISTICS OF MIDI RAILWAY ELECTRIC LOCOMOTIVES

(Approximate Data)

	Jeumont	Thomson-Houston	Westinghouse
Length of locomotive over bumpers	46 ft. 9½ in.	45 ft. ½ in.	37 ft. 3 in.
Length of cab	41 ft. 4 in.	.....	34 ft. 11 in.
Height of cab above rail	11 ft. 6½ in.	.....	12 ft. 8 in.
Height over pantograph, raised	21 ft. 4 in.	.....	.....
Height over pantograph, lowered	14 ft. 9½ in.	.....	.....
Diameter of driving wheels	4 ft. 7 in.	4 ft. 3½ in.	3 ft. 11 in.
Diameter of pony wheels	3 ft. 3½ in.	2 ft. 9½ in.	.....
Distance between centers of outside motor axles	11 ft. 10 in.	12 ft. 10 in.	13 ft. 1½ in.
Weight per driving axle, tons of 2000 lb	19.8	.....	19.8
Total weight, tons	95	97	89
Maximum speed, m.p.h.	46.6	48.5	46.6

Motors Are of the Series Compensated Type

Although the details of the motors and controls were discussed in the European technical press when the preliminary tests had been completed, and an abstract from an article in the *Elektrotechnische Zeitschrift* was printed at the time in the ELECTRIC RAILWAY JOURNAL, it is worth while at this time to summarize the control principles employed particularly because the method by which the locomotive is made to regenerate power is of great interest. The Jeumont control may be taken as typical; it operates briefly as follows:

The motors are of the series compensated type, and the rotor does not differ in construction from the armature of a direct-current machine. The stator, however, comprises three distinct windings: A series winding of one turn per pole, a compensating winding and a commutating winding mounted in the same slots as the compensating winding. The accompanying figure shows in simplified form the motor connections. It will be seen the commutating winding is connected in parallel with the compensating winding and the number of turns in each is so arranged that when the currents which flow in the windings superimpose their magnetic fields they produce a suitable commutating field in the armature turn which is short-circuited under the brush. This field, of course, opposes the field which is produced by the short-circuited turn. By proper designing it has been possible to secure good commutation over wide limits of current.

In the series connections of the motors it is possible by means of the control to subject each to a voltage varying from 67 to 230. For use in starting and running at low speed the connections are so arranged that the motors act as repulsion motors.

The commutating windings of the motors are connected in parallel and produce a rigid electrical coupling. If one motor tends to revolve faster than the other, its commutating winding becomes the source of a voltage higher than that in the corresponding winding of the other motor. A circulating current results in the commutating windings in such a direction as to speed up one motor and restrain the motor of higher speed until speed equality is re-established.

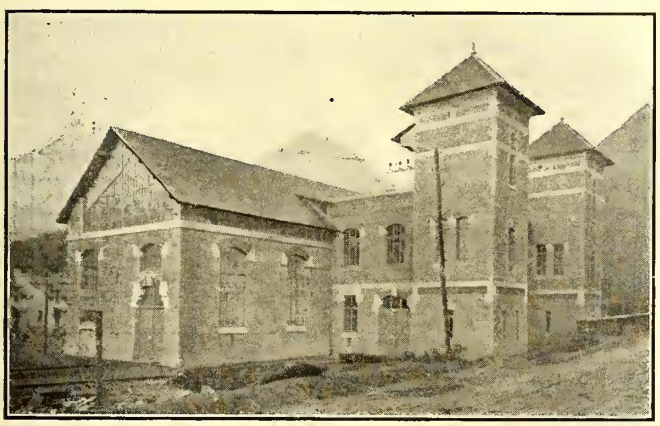
For regenerative operation there is substituted for the series excitation of the motors an independent excitation, which however forms an integral part of the system. The motors operate as shunt generators with the frequency of the exciting current, which is the same as that of the line, producing a voltage determined by regulators whose voltage determines their speed of operation.

In regenerating, as the motors operate in parallel with the alternators of the system, it is necessary that their voltage have a proper value and phase relation with respect to the line voltage, as well as a proper relation to the speed of the locomotive. For control of voltage magnitude an induction regulator, automatically operated, is employed.

Some Important Phase Relations

The phase control is roughly as follows: The electromotive force induced in the motors by rotation is in phase with the exciting flux, and this is itself in phase with the current in the inductors, displaced about 90 deg. from the voltage at the terminals of the latter. The exciting voltage in the inductors of the motors is therefore displaced by 90 deg. from the line voltage by the aid of an auxiliary winding placed on the stator winding of the compressor motor at 90 deg. space displacement from the power or torque-producing winding fed by the system. There is thus impressed on the terminals of the motor inductors a voltage nearly in phase with that of the low-tension side of the transformers.

When the motors are supplying current as generators, the reactance of their winding throws their voltage out



SOULOM POWER PLANT OF THE MIDI RAILWAY, SOUTHWESTERN FRANCE

of phase with that of the line. The reactance of the motor circuit, of course, includes that of the transformers also. This reactance is about three times as great as the resistance, so that as generators the motors operate with a powerful de-phasing effect, considerably reducing the torque.

To reduce the phase displacement between current and flux, the motors are excited with a voltage displaced more than 90 deg. from that of the line. This result is obtained automatically by the use of a compounding transformer which displaces the phase of the primary voltage of the transformer.

Some Test Results Secured

Some tests were made to determine the resistance of the Jeumont locomotive by determining the loss in speed while traversing a course of given length under its own momentum. Results are shown in Table II, which gives the resistance in pounds per ton. Obviously the resistance thus obtained includes all components including that due to irregularities in the track.

TABLE II—LOCOMOTIVE RESISTANCE AT VARIOUS SPEEDS

Speed in m.p.h.	3.1	6.2	9.3	12.4	15.5	18.7	21.8	24.9	28.0	31.1
Resistance in pounds per ton	7.5	7.6	7.8	8.2	8.6	9.0	9.5	10.0	10.7	11.8

TABLE III—LOCOMOTIVE TEST DATA

Weight Moved, in Tons	Spend in m.p.h.	Power Absorbed, in Kw.	Line Voltage	Current in Amp. High-tension	Current in Amp. Low-tension	Power Factor, per cent	Low-tension Voltage
309	25.5	1,100	10,300	120	1,625	90.0	650
110	37.9	850	11,300	83	1,100	91.5	700

Results obtained in drawing loads on a 1.7-per cent grade, containing a number of curves, are given in Table III. With the voltage raised to 12,000 the corresponding speeds were 22 m.p.h. and 30 m.p.h. for the two train weights respectively. The power factor was slightly better also.

With a 280-ton train the power returned to the system was about 400 kw. on a grade of 1.7 per cent. The power absorbed in driving the same train on the same grade and at the same speed was 1020 kw. Thus the coefficient of regeneration or recuperation was 39.2 per cent.

The Westinghouse locomotive produced a tractive effort of 33,000 lb. or more, and the following results were obtained with a 280-ton train: speed, 26 m.p.h.; power developed at the wheel tread, 950 hp.; power absorbed, 970-kw.; line voltage, 11,000; current. 100 amp.; power factor, 88 per cent; efficiency, 72.4 per cent; approximate tractive effort, 13,500 lb.

New Franchise in Paducah

SOME new features as regards an electric railway franchise are contained in a settlement measure passed by the board of commissioners of the city of Paducah, Ky., on April 4, 1919. The franchise has not been accepted by the Paducah Traction Company, the electric railway in that city, because the company is now in the hands of a receiver. The reorganization managers for the bondholders' protective committee are Stone & Webster, and the property is being operated by A. S. Nichols. The company was consulted in the draft of this franchise, however, and it is expected that the franchise will be accepted after the company has been reorganized.

With the exception that a maximum fare of 6 cents for the first year is specified, the franchise is on the service-at-cost basis, with a review of the earnings every twelve months to determine the fare to be charged during the next twelve months. In this determination the ordinance provides that the company is to receive a sufficient sum to pay operating expenses and a reasonable rate of return on the capital invested, all earnings over this amount to be paid to the city. The city has the right to regulate the service, provided such regulation does not "impair the present or future ability of the company to earn a reasonable return on the value of its property."

No paving is required except that the company must provide the pavement foundation between its rails and for 1 ft. each side, the surface paving being provided by the city. Another important feature of the franchise is the specification that the cars shall be entitled to a right-of-way on its tracks, and vehicles on or close to the tracks must turn out whenever a car approaches. In case of refusal to do so when signaled or requested by the trainman, the driver of any vehicle is subject to a fine of $10. Also, the right is reserved to abandon unprofitable lines upon proof of the fact and approval by the city authorities.

Typical Zone Tickets from Abroad

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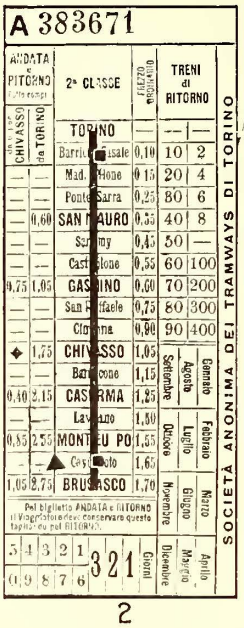

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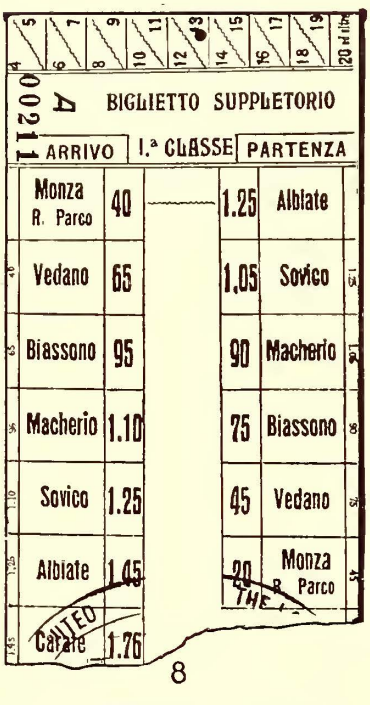

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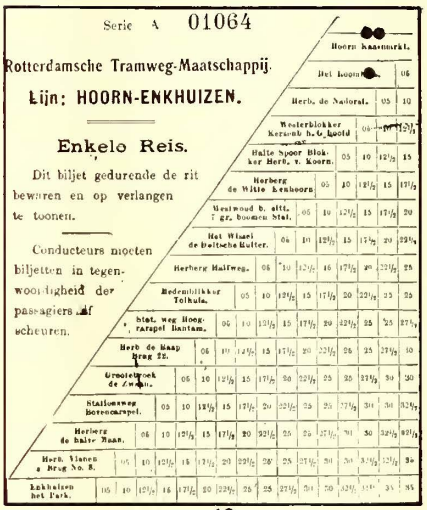

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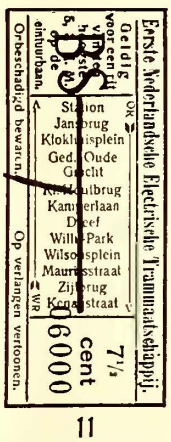

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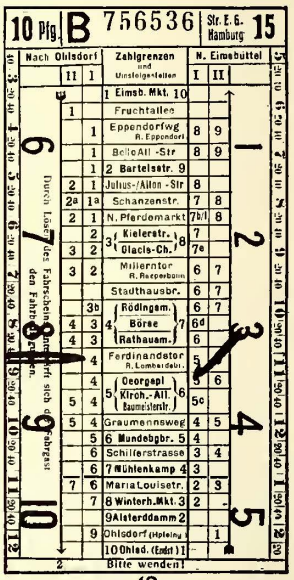

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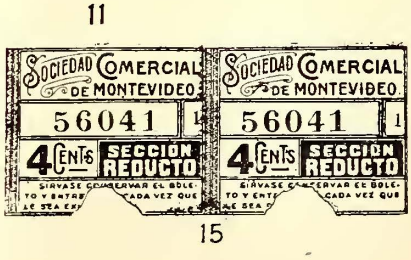

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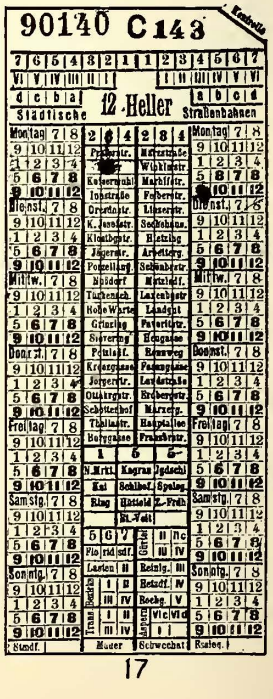

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No. 1—Unione Italiana Tramways Elettrici, Genoa, Italy.
No. 2—Società della Tramvie di Torino, Turin, Italy.
No. 3—Tramvie Interprovinciali, Milan, Italy.
No. 4—Neapolitan Tramways, Naples, Italy.
Nos. 5 and 6—Sicilian Electric Service Company, Palermo, Italy.
No. 7—Società Elettrica Comense, Como, Italy.
No. 8—Lombardy Road Railways, Milan, Italy.
No. 9—Municipal Tramways, Amsterdam, Netherlands.
No. 10—Rotterdam (Netherlands) Tramways.
No. 11—First Dutch Electric Tramway, Haarlem, Netherlands.
No. 12—Hamburg (Germany) Electric Street Railway.
No. 13—Municipal Tramways, Potsdam, Germany.
No. 14—Commutation Ticket, La Sociedad-Comercial, Montevideo, Uruguay.
No. 15—Ordinary Ticket of Same Company.
No. 16—Anglo-Argentine Tramway, Buenos Ayres, Argentine.
No. 17—Municipal Tramways, Vienna, Austria.

Typical Zone Tickets From Abroad

Exhibits from Europe, Asia and South America Show Use of Three General Types—"Duplex," "Check-Stub" and "Fixed-Amount, Ride-Limit"

BY FERDINANDO C. CUSANI
Milan, Italy

THE necessity of adopting a zone fare to meet ever-increasing costs has brought many American operators face to face with an abrupt change from the almost automatically computable and easily collectible universal fare to the complicated zone fare. And the zone fare, unless it be carefully tackled, threatens to impair the efficiency of prepayment in all of its different forms.

The only zone plan that can be easily effected, without considerable change to the existing prepayment cars and their fare collection equipment, seems to be the "pay-enter-pay-leave" advocated by Professor Richey, with two zones, and one or two registers, depending on whether the zones have the same or a different price.

The plan of using a multiple fare register, while it may be the most simple solution from a purely technical standpoint, does not appear perfect, as it does not afford absolute protection from overriding. Such a plan gives no proof that any individual passenger has paid his fare up to the point where he wants to leave the car.

On the other hand, the system of making passengers pay the initial zone fare first, and of collecting additional zone payments at the beginning of each successive zone by means of a portable register, may be perfectly good on old-type cars. It would be, however, a rather difficult practice on modern cars, where the door and step control and other safety devices require that the conductor be always stationed on the platform.

The Public Service Railway front-entrance rear-exit postpayment plan, though requiring totally different and rather cumbersome fare registering equipment, seems the only way of dealing correctly with the situation, provided four-door cars be available. As this does not always happen to be the case, many electric railway operators seem inclined to take up the European plan, by which a receipt is issued to each passenger upon collection of the fare.

A review of the most used types of tickets or fare receipts, therefore, may be of interest to these officials and, in general, to anybody connected with the fixing of fares and the supervision of rapid transit traffic. The receipts shown herewith will give a fair idea of the efforts of many properties to handle the zone-fare problem. It has been deemed inadvisable to include a description of the British stage-ticket plan, inasmuch as this has already been dealt with in both a pleasant and a very exhaustive way by Walter Jackson in his series of articles on "The Zone Fare in Practice."

THREE GENERAL FORMS OF TICKETS

All zone tickets can be traced down to three general forms, *viz.*: the "duplex," the "check-stub" and the "fixed-amount, ride-limit." The first type consists of two tickets printed in such a way that when the first is folded against the second and punched all punches appear also on the second, which remains in the ticket book for checking and accounting purposes. The second type, which is much similar to a ticket widely used on American railroads as a conductor's receipt for fares collected aboard the trains, the value of the fare collected, being determined by the point at which the stub is made when the receipt is torn off. The third type requires as many tickets as there are different rates of fare, each bearing printed marks for punching to show the limit of ride.

Receipt No. 1, issued by the Italian Union of Electric Tramways, Genoa, Italy, is of this last type, a single punch being required to show the limit of ride. Receipt No. 2 is a duplex universal ticket used by the Turin Tramways on one of its interurban lines. The two square punches, which were made by the conductor at the moment of sale, showed what the ticket was worth as a single-trip receipt; the triangular hole, punched by the traveling ticket examiner just before the passenger reached his destination, indicate that the receipt was void thereafter. If this same ticket had been used as a round-trip ticket, the conductor would have punched either in the first column on the left, showing return rates to and from Chivasso, or in the second, giving the same from Turin. In each case he would also have had to punch the month and the day of issue (this last by using one of the three big and one of the ten small numerals at the bottom of the slip). On the return trip the conductor of the second train would have punched the returning train's schedule number under the heading "Treni di ritorno." Receipt No. 3 is a duplex ticket used by the Interprovincial Tramways, Milan, Italy. It is good for a 30 centesimi ride between the two stations punched; a time limit punch is provided, and the date is rubber stamped on the back.

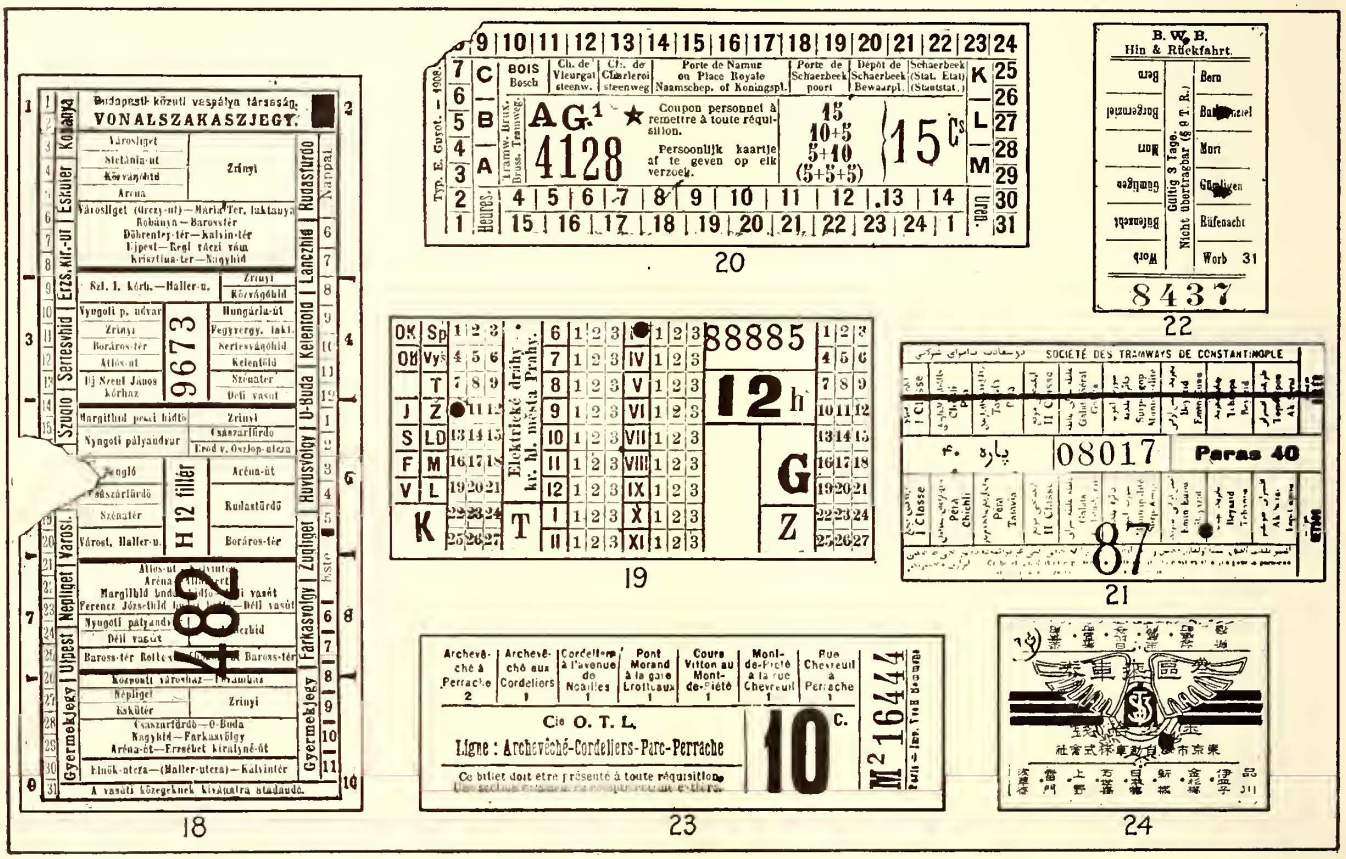
Receipt No. 4, of the Neapolitan Tramways, Naples, Italy, is of the ride-limit type; it has a zone-fare tariff printed on its back. Receipt No. 5, of the Sicilian Electric Service Company, Palermo, Italy, is a zone-fare transfer from a belt line to a radial line; it carries both a time and a date punch. Receipt No. 6, from the same city, gives the right to a continuous ride on four zones, the number of sections in which the line is divided being shown on the back. Receipt No. 7, of the Como (Italy) Electric Power Company, is a simple two-zone ticket with a ride-limit punch.

Receipt No. 8, of the Lombardy Road Railways, Ltd., Milan, Italy, is a "check-stub" receipt requiring a pair of scissors for use. Tickets of this sort have been nicknamed "pair of pants" by the employees. Nobody seems to like them much, for they require high calculating powers for issuance, payment and checking. The price is the difference between the amount printed near the point of origin and that shown near the point of destination. The time limit at the top is punched by the ticket examiner. Only part of this ticket is shown.

Under the old plan used by this same company, the

conductor would issue a ticket for a given number of zones, and the ticket examiner immediately following him would punch it and remember the passenger to whom it had been issued. This same examiner would pass before reaching every station and gather in all tickets due at that station. In case of any dispute arising between the examiner and the passenger as to the limit, a look at the day card, on which the conductor had been required to write down, after passing through the train, the top numbers of all the ticket books, would suffice to show after which stop the receipt had been issued. This plan, although requiring two employees (the light railways laws required, anyhow, that on the difference) must be an art not totally unknown to the Dutch conductors. Receipt No. 11 is a 7½-cent zone ticket "good for one ride of at most three kilometers" on the belt railway of Haarlem, Netherlands.

Receipt No. 12 is for a 10 pfennig zone on the Hamburg (Germany) Electric Street Railway; it may be used as a straight fare receipt or as a transfer from route 15 to any connecting line. The zone numbers are shown in red, and a time limit is provided in the outer columns. Tickets in Dresden, Frankfurt, a./M., Mainz and Cologne are, more or less, of the same pattern, but the Potsdam Municipal Tramways tickets (Receipt No. 13) are of the simple zone-limit form.



18 19 20 21 22 23 24

No. 18—Budapest (Hungary) Tramways.
No. 19—Prague Czecho-Slovachia Tramways.
No. 20—Tramways Bruxellois, Brussels, Belgium.
No. 21—Constantinople (Turkey) Tramways.
No. 22—Berne-Muri-Worb Tramways, Berne, Switzerland.
No. 23—Lyons Tramways & Omnibus Company, Lyons, France.
No. 24—Tokyo (Japan) Motor Bus Service.

Typical Zone Tickets from Abroad

steam interurban trains without air brakes at least two train employees be provided), was very simple from the checking and accounting standpoint, as it entailed only the checking of the opening and the closing numbers of each ticket book. It was abandoned on account of the company passing under the control of another interurban systems where the "pair of pants" forms were already used.

Receipt No. 9 shows a 7½ cent ticket of the Municipal Tramways, Amsterdam, Netherlands, the three numbers in the corners being those of the sections in which the lines are divided. Receipt No. 10 is a duplex of the Rotterdam (Netherlands) Tramways used on the Hoorn-Enkhuizen suburban line. Advice to the passenger reads as follows: "Conductors must tear off tickets in sight of the passenger"—which may mean that the double-punch trick (punching the ride ticket in one way and the stub ticket in another, and pocketing

Receipt No. 14 is a monthly commutation card for section "Unión y Maroñas" of the Montevideo (Uruguay) Commercial Company, and Receipt No. 15 is a zone ticket. The fare inception point is ascertained through reading the day cards ticket sales record, which must be filled in after the passing of each section limit. The right-hand half of the ticket may be torn off by a traveling ticket examiner. Receipt No. 16 is a straight fare ticket of the Anglo-Argentine Tramway, Buenos Ayres, Argentina, its distinction lying in the fact that it is issued through a device—resembling the British bell punch—which is carried by the conductor.

The Municipal Tramways, Vienna, Austria, receipt (No. 17) shows what appears to the writer to be a useless complication, all the time-punch numerals being printed under each of the week days. In fact, these tickets do require a lot of patience and attention on the part of both the conductor and the rider. The

Budapest (Hungary) Tramways ticket (No. 18) has zone number marks on the outside, a thirty-one day and a 6 a.m. to 11 p.m. time limit column, route indications and, in the inner part, ride-limit and transfer-point marks. As with a number of other tickets, the conductor indicates the point to which fare has been paid by tearing a piece out of the fare receipt. The Prague (Czecho-Slovachia) Tramways ticket (No. 10) shows day, hour and thirds-of-an-hour limits.

Receipt No. 20, a transfer used by the Brussels (Belgium) Tramways, is remarkable inasmuch as the fare can be split up in a number of rides, as shown by the numerals with plus marks. The Constantinople (Turkey) receipt (No. 21) is worth a fixed amount and is good both for first and second-class travel, giving a right to ride on longer zones in the second than in the first. The Berne-Worb (Switzerland) tickets (No. 22) are duplexes; the conductor must punch both parts under the eyes of the passenger and tear off the check part, putting it into a sealed box which he carries and which will be opened upon his return to the carhouse. The Lyons (France) ticket (No. 23) is a simple ride-limit receipt; the Lyons Omnibus & Tramways Company uses a special time printing stamp for canceling transfers.

As for the Tokyo (Japan) Omnibus ticket, it may be understood that it contemplates the fixing of zones; but as it happens to be, well, plain Japanese to the writer, he will be glad to give up its full interpretation to some of his more learned readers.

The Graduated Fare at Brisbane, Australia

BY J. S. BADGER
Managing Director Brisbane Tramways Company, Ltd.

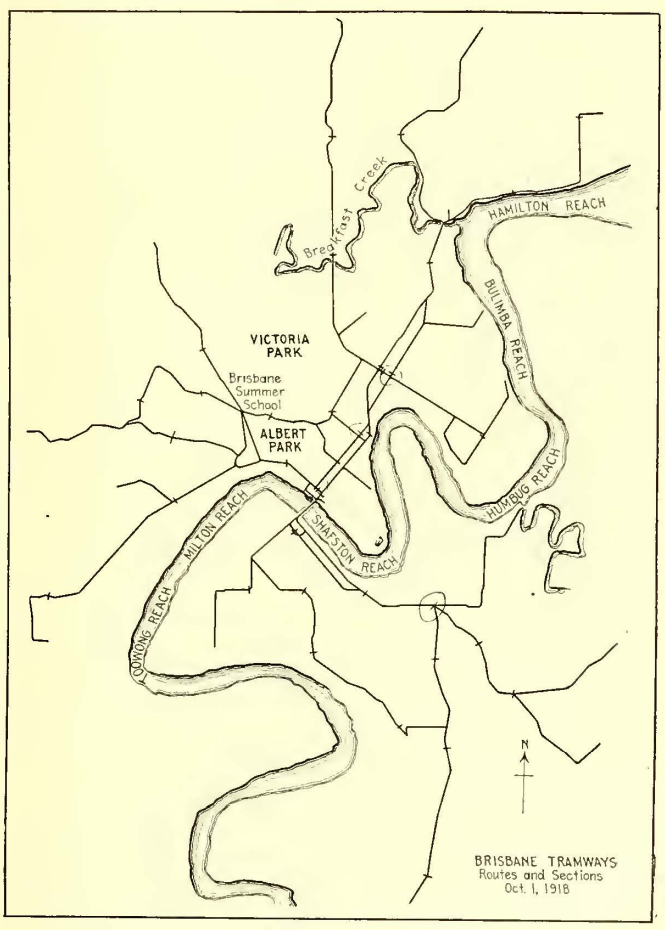
Mr. Badger Says That the Adoption of the Universal Fare Would Provoke a Riot! In 1918, Collections Were 45.15 Cents Per Car-Mile With 60 Per Cent of the Riders Paying Only 2 Cents Each

I WANT to emphasize first that the section fare system, as in operation in Brisbane, Sydney, and English and Continental towns is, strictly speaking, different from the "zone" (central area) system as discussed in America. The section system simply means that the passenger pays according to the distance that he travels. Certain points called "section points" or "stations" are established with a uniform fare of 1d. (2 cents) between any two points. We endeavor to make these sections or stages as nearly 1 mile in length as practicable, but in order to locate these at points where traffic naturally concentrates there is necessarily some variation. The general rule in Brisbane and Sydney is that the outlying or suburban sections are rather longer than in the center of the city in what is properly the retail shopping district, from any point in which the through fare in any direction is only 3d. (6 cents) if paid at one time, although the distance may cover three to five sections.

The accompanying map shows the Brisbane Tramways lines, together with the section points. The various routes correspond with the chart, on page 482, which shows the routes and section points all drawn to the same scale.

As a rule, cars stop at all intersecting streets except in a few cases, and in the middle of long blocks in the center of the city. Our stopping places average about fifteen to the mile in the city. Our purpose is to encourage the short rider and to make the tramway approach as nearly as possible to a moving sidewalk. All section points are compulsory stops. Other stops are made only on signal.

In operation the section system tends to concentrate traffic at a few principal points, especially morning and night, when many passengers—particularly working people—will walk a short distance to a section point in order to save 1d., which they would pay for riding part of a section. But by properly locating section



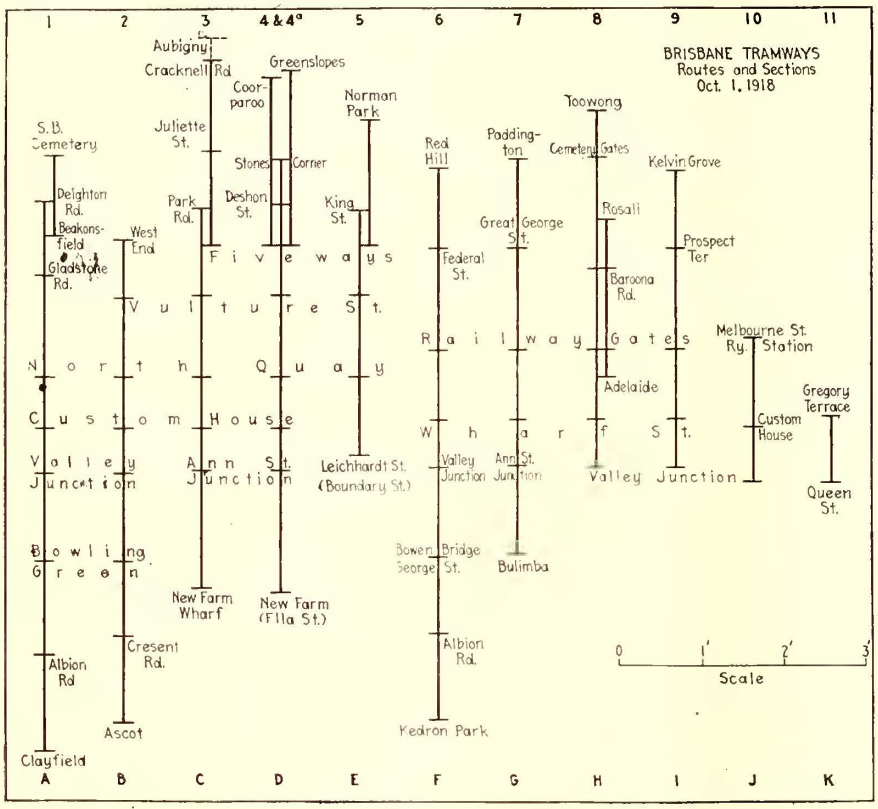
BRISBANE TRAMWAYS AND SECTION POINTS

points in the business district, we encourage short riding on the part of shoppers and business people during the day.

If anyone objects that Brisbane, with its 170,000 population, is not a fair example, I would say that Sydney with more than 750,000 people has substantially the same system. In either city, a change to the old straight fare system, as in vogue in the United States, would result in riots.

We maintain a regular headway of not less than ten minutes on all lines all day. This is supplemented during the rush hours of morning, noon and night by short trippers covering one or two sections. During the busy hours of night we have an outbound car from the business district on an average of less than fifteen seconds and at times less than ten seconds. The seating capacity of our cars varies from thirty-four on some of our old-style single-truck cars to fifty-six for our more modern, double-truck center-aisle cars.

For the year 1918, our traffic receipts were 45.15 cents per car-mile, and 60 per cent of the fares came from penny (2-cent) passengers. For 1919, until the influenza epidemic struck the country, the receipts approached 40 cents a car-mile. Of course, there are no transfers. If a person wishes to ride on two lines he pays the proper fare on each line. For 1918, we carried 13.1 passengers per car-mile at an average of 3.36 cents per passenger. According to the United States method of accounting, this would really mean "passengers including transfers."



VARIATIONS IN LENGTHS OF PENNY SECTIONS ON BRISBANE TRAMWAYS

FARE RECEIPT SYSTEM WITHOUT BRITISH BELL PUNCH

Brisbane uses no bell or registering type punches. They were in use years ago, but we found them a source of irritation to the conductors and of slight value. The registering mechanism was inaccurate, a fact which the conductors soon learned, and counting the disks (ticket punchings) was an interminable job. As noted hereinafter, all our tickets are numbered consecutively, and as it is an easy matter to keep account of the tickets issued to each conductor and of the number sold, we see no utility in a registering punch. Tickets are printed by the company in its own office, and errors in numbering or putting them up are very rare.

Now as to the details of operation. We use three kinds of tickets: 1d., 2d. and 3d., one of which is reproduced. These tickets are put up in packages of fifty, wire stitched at the end, with perforations which permit them to be easily detached. Only complete packages are issued to the conductors, all broken packets being destroyed, even if but one ticket has been used. We found that the clerical labor involved in the reissue of partial packets cost more than the tickets.

The 1d. ticket is for one section, the 2d. ticket for two sections and the 3d. ticket for three or more sections. The points between which a passenger is entitled to ride and the direction in which he is traveling are indicated by a punch mark in the margin of the ticket opposite the proper designation. Each conductor is provided with a punch having a special die, and he keeps that punch all the time. If a person should pick up a ticket on the street, the conductor who issued that ticket could be identified at once, and by reference to his waybill it would be possible to tell very closely the place where the ticket was issued and the time it was issued. The conductor enters the starting number of each kind of ticket on his waybill, on each half trip. Tickets wrongly punched are not issued but are turned into the office with a report where they are credited to the conductor's account.

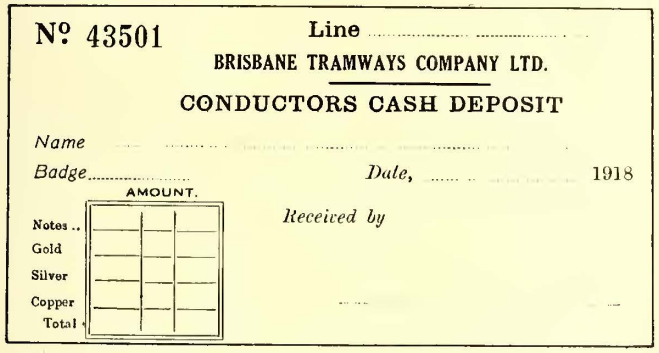
Ticket inspectors board the cars at various points to check up and see that all passengers have their tickets. Under our by-laws a passenger is obliged to produce his ticket whenever called upon. Failure to produce the ticket, even though he has paid his fare, is an offense for which he may be fined. Of course, we had some trouble in the beginning to get passengers to keep their tickets until they left the car, but a few prosecutions brought them to a realization of the situation, so that now we have no difficulty. If an inspector finds a passenger without a proper ticket he requires him to pay the fare. We never eject a passenger for nonpayment, but get his name and address with witnesses. Prosecution follows.

All counting of cash and checking of tickets is done at the head office where all cars pass. Conductors pay in at this office about every third trip, using a returns envelope with the lettering shown in the reproduction on page 483. Conductors are not expected to pay in any fractions of 1s. These payments are entered on the waybill where the envelope number is entered, and this is initialed by the officer who receives the envelope. This does not guarantee that the amount is correct, but that an envelope purporting to contain a certain amount was received. When the conductor finishes his day's work, he turns in his waybill, all unsold tickets and cash to balance. The method of making this up will be seen plainly from the waybill reproduced.

Conductors are provided with little printed cards showing the amount representing any number of tickets sold, so that they do not have to do any calculating themselves. They are required to settle according to the number of tickets sold and are expected to make up any "shorts." All "overs" are returned to the conduc-

tors. A conductor, who, according to the individual record of "shorts" and "overs" shows above a certain percentage of errors is dispensed with. A series of "shorts" means prompt action. We do not demand "blind" returns, for conductors simply will not make them. There is no use in having a rule which we all know is easily evaded.

We have two classes of inspectors—traffic inspectors and ticket inspectors. The former are engaged princi-



Nº 43501 Line .....

BRISBANE TRAMWAYS COMPANY LTD.

CONDUCTORS CASH DEPOSIT

Name .....

Badge..... *Date*, ... 1918

AMOUNT.

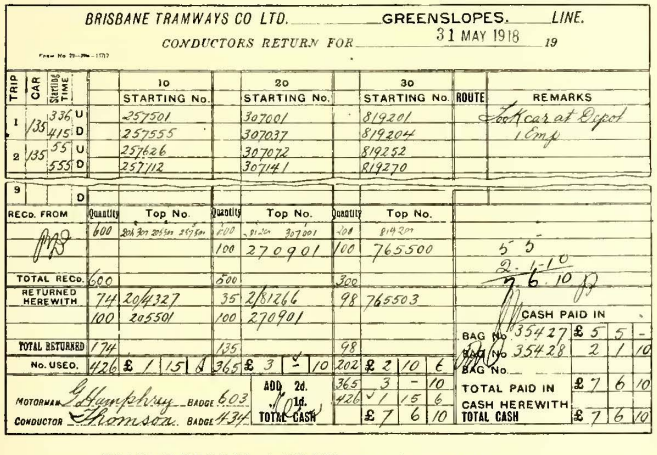
Notes ..
Gold
Silver
Copper
Total

Received by .....

CONDUCTOR'S CASH DEPOSIT FORM

pally in handling the traffic and generally in supervising operation outside. They are expected to attend promptly and report all accidents, and in case of injury to a person, they must see that aid is promptly rendered. They may suspend any motorman, conductor or other outside traffic employee, when deemed necessary in the interests of the company, reporting the same at once by telephone to the superintendent and following this message with a written report. They may also at times perform the duties of ticket inspectors.

The chief duty of the ticket inspectors is to examine the tickets of passengers to ascertain if the proper fares have been paid and the tickets issued and punched correctly. All violations of the company's regulations,



BRISBANE TRAMWAYS CO LTD. GREENSLOPES. LINE.

CONDUCTORS RETURN FOR 31 MAY 1918 19

TRIP	CAR	STARTING TIME		10 STARTING No.	20 STARTING No.	30 STARTING No.	ROUTE	REMARKS
1	336 / 335	4/15	U	257501	307001	819201		Tool car at Depot 10 mp
			D	257555	307037	819204		
2	335	555	U	257626	307072	819252		
			D	257112	307141	819270		

RECD. FROM	Quantity	Top No.	Quantity	Top No.	Quantity	Top No.
	600	204327 204501 205501 206501	200	307001	101	819201
			100	270901	100	765500
TOTAL RECD.	600		300		300	
RETURNED HEREWITH	74	204327	35	270266	98	765503
	100	205501	100	270901		
TOTAL RETURNED	174		135		98	
No. USED.	426	£ 1 15 6	365	£ 3 - 10	202	£ 2 10 6

		365	3 - 10
ADD 2d.		426	1 15 6
TOTAL CASH			£ 7 6 10

MOTORMAN G. Humphrey BADGE 603
CONDUCTOR Thomson BADGE 434

BAG No.	35427	£ 5	5 -
BAG No.	35428	2	1 10
BAG No.			
TOTAL PAID IN		£ 7	6 10
CASH HEREWITH			
TOTAL CASH		£ 7	6 10

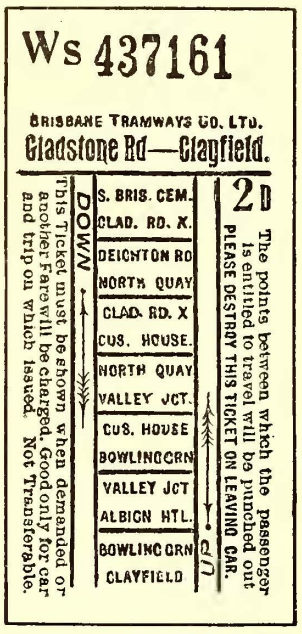
CONDUCTOR'S ACCOUNTING OF TICKETS ISSUED AND SOLD

either by employees or passengers, are reported and such action taken by the management as is deemed advisable.

The company employs no "spotters," relying entirely upon its uniformed staff of inspectors to correct all irregularities. Reports from other employees are discouraged. It is understood that when the manager is riding on a car he is not looking for slips on the parts of the employees.

The cost of living is considerably less than in the United States, but I think that the wages paid on the Brisbane system are relatively higher than in the United States. Forty-eight hours is the standard working week, and we reduce overtime to the smallest possible amount. No man works more than six days out of seven in any one week. In the power house and all other departments where continuous operation is required, there are three eight-hour shifts each day, and no man works more than six shifts in any one week. Of course, accidents may require a variation of this rule, but they are an exception.

The operating day of a car is sixteen to seventeen hours. The rule is, early out, early in. There are two shifts per car, with two meal reliefs. Conductors and motormen alternate, taking an early shift one week and a late shift next week, and work all the different time-tables in rotation. If a regular time-table is less than forty-eight hours in one week, the conductor is paid for forty-eight hours. If it is over forty-eight hours, he is paid overtime rates for the excess. As to the actual standard of living, I think that the workingman in Australia enjoys a rather higher standard than his mate in the United States.



Ws 437161

BRISBANE TRAMWAYS CO. LTD.

Gladstone Rd—Clayfield.

DOWN

S. BRIS. CEM.
CLAD. RD. X.
DEIGHTON RD
NORTH QUAY
CLAD. RD. X
CUS. HOUSE.
NORTH QUAY
VALLEY JCT.
CUS. HOUSE
BOWLING GRN
VALLEY JCT
ALBION HTL.
BOWLING GRN
CLAYFIELD

2D

The points between which the passenger is entitled to travel will be punched out PLEASE DESTROY THIS TICKET ON LEAVING CAR.

This Ticket must be shown when demanded or another Fare will be charged. Good only for car and trip on which issued. Not Transferable.

FARE RECEIPT FOR 2-PENNY FARE

I have been much amused at reading learned discourses in the electric railway papers about the insuperable (?) obstacles in the way of adopting the sectional zone system in the United States. Most of the objections urged against the system are such as to indicate that the objector knows very little about the subject. The system has been in use in Brisbane for about twenty-five years and was modeled largely upon that in use by the London General Omnibus Company, with certain modifications to suit local conditions and to reduce clerical labor in accounting. When the Sydney Tramways were electrified, the same general system was adopted there with some differences in details to suit individual ideas.

In operation, this system is simplicity itself but is not well adapted to the pay-as-you-enter cars. Of course it requires a little more work on the part of the conductor sometimes, as he is obliged to check up his car to a certain extent after leaving each section point, but our experience is that conductors become so expert in keeping track of their passengers that our losses from uncollected fares are very small. Sometimes we find it necessary to put two conductors on a car when leaving the city at rush hours, but the extra conductor rides only a short distance. The checking of cars by inspectors is done at irregular intervals and a different places, so that neither the conductor nor the passengers know when an inspector will board the car.

From my point of view, the principal difficulty in the way of a reasonable readjustment of street railway fares in the United States is the unwillingness of the American operator and the public to profit by other peoples' experience.

I can heartily indorse the following excerpts from Walter Jackson's article on the "Zone Fare in Practice —Glasgow," published in your paper for Feb. 22, 1919, reading: "The most casual investigation *on the ground* will show that the connection between the distribution of population and the system of fare charging is a minor rather than a major factor in the development of municipalities."

Our experience is that higher rents counterbalance the lower fare for the interior districts and that lower rents and lower property values counterbalance the higher fares in the outlying districts. This is distinctly so in Brisbane, where by far the greater part of the laboring population lives in the outlying districts.

Publicity for Zone Fares

What Public Service Is Doing to Inform Car Riders and Employees of the Details of Its New Fare Schedule

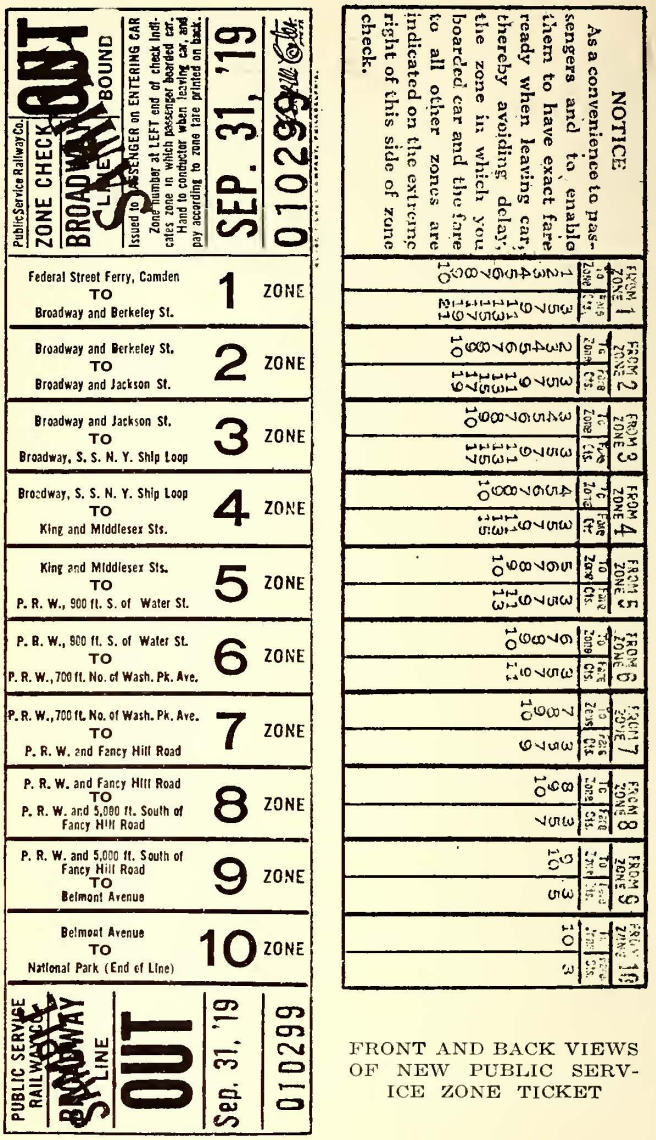
INFORMING both the public and its own organization of the details of the zone-mile system of charging fares, which will go into effect on Sept. 14 on the Public Service Railway system, has been a task in which the company has been engaged since last spring, from the moment, in fact, that the zone plan called for by the Board of Public Utilities Commissioners of New Jersey was submitted by the company on Mar. 11.

The importance of this task was magnified by the fact that the zone plan about to become operative is the first of its kind to be instituted on a street railway system in this country, and that in its operation it revolutionizes certain methods, and materially changes the habits of the riding public. Therefore, in order that the plan should receive a fair start, the railway company has devoted every means at its disposal toward conveying to all persons interested the complete details of the system.

First, the public had to be told the reasons for the submission of the zone plan. The Utilities Board had directed that the company present a plan whereby the method of charging fares in force might be revised over its entire territory so as "more properly to relate the cost of service with the length of haul and value of service." The company faced the necessity of securing additional income, and the zone plan presented the fairest method known of securing this additional revenue. The public had to be told these facts.

Therefore, with the submission of the zone plan to the State body the company began the publication in the newspapers of a series of advertisements, a new advertisement each week in daily and weekly publications throughout its entire territory. The first ten of these advertisements, captioned, "Fare Zones for Street Cars," and continuing to include the week of June 1, discussed various phases of the zone plan. "Standby" and "Movement" costs were explained, the company's financial situation, the increased costs of labor and materials and restricted revenues were set forth, and the fairness of the "pay-for-what-you-get plan" under the zone-mile basis, was emphasized. The saving to a large proportion of riders under the zone plan was also pointed out.

Throughout these advertisements and subsequent series there was continued the thought that the zone system was the fairest method known as it applied to the rider and to the company.



FRONT AND BACK VIEWS OF NEW PUBLIC SERVICE ZONE TICKET

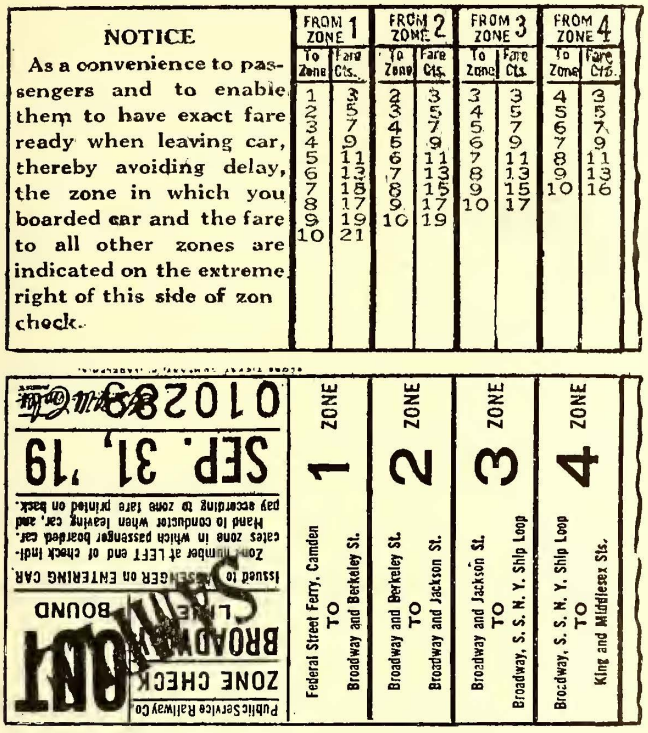
The ten advertisements were followed by a series of eight shorter ones, each taking a single point previously discussed and briefly reiterating it. This series continued up to and including the week of Aug. 8.

In the meantime the Public Utilities Board was holding hearings upon the company's zone report which, under conditions which obtained at the time the report was filed, set up a fare of 5 cents for the first zone-mile, 1 cent for each additional mile and a penny for a transfer as a rate which would meet the company's requirements.

The National War Labor Board, however, in an award which became effective as of May 1, granted an increase in the wages of trainmen which amounted to $1,150,000 annually in the company's payroll. This necessitated a revision in the fare rate to meet the additional cost, and the State Board, on Aug. 1, directed the placing of the zone plan in operation on Sept. 14, under a rate of 3 cents for the first zone-mile and 2 cents for each additional zone-mile or for any part thereof.

With a definite zone-mile rate and a time for its operation set, the company could proceed to instruct its own forces as well as continue its publicity for the benefit of the public.

Accordingly a new series of advertisements was inaugurated, reverting to the larger size space of the



TORN END SHOWS ZONE AT WHICH PASSENGER ALIGHTED AND FARE TO FOLLOWING ZONES

first, in which the various methods of boarding and leaving cars and paying fares under the new plan were explained. It was pointed out that the new plan of boarding cars by the front end and leaving by the rear platform, and paying fares at the end of the ride, was simply a change in habit, reversal of former procedure. This series of advertisements will be continued as long as the necessity for public information through the press is seen.

Details of Educational Program

Immediately upon the issuing of the State Board's order establishing the zone plan, the company began informing the rank and file of its organization of what would take place. The original zone report, although it had been predicated upon the "5 and 1" rate, formed a working basis. It was necessary to revise details of mechanical devices and to prepare zone checks, tickets and accounting forms to meet the "3 and 2" plan, and this was speedily done. Between Aug. 1 and Sept. 1 division heads and supervisory forces had been instructed in the workings of the new system and the instruction of trainmen had begun. In the latter connection there was first prepared and issued a pamphlet, "Facts About the Zone System," which briefly explained the chief points to motormen and conductors, while cards giving the zone points on each line were issued to the operating men. These will be followed by booklets giving the zone points on all lines for permanent use. An extensive supplement to the trainmen's rule book has been printed, covering the working of the plan in detail.

All zone points were indicated by marking wide yellow bands on poles, with the zone numbers stencilled in 6-in. black letters on the face of the pole. More than 1000 poles were so marked.

As an additional means of informing the public, a series of posters was printed. The first, which made its appearance on the platforms of cars on Aug. 31, and so placed as to meet the eye of the boarding passenger, reads as follows:

Riders Will Board
Cars at
Front End
and Leave at
Rear End
Under the Zone Plan
Effective Sept. 14

On Sept. 7 the foregoing posters will be replaced by the second of the series, reading:

Beginning Sept. 14

Pay-as-You-Leave
Under the Zone Plan
Instead of
Pay-as-You-Enter

The third of the series will appear on Sept. 14 and will read:

Get Zone Check
From Motorman
Give to Conductor
When Paying Fare
Pay-as-You-Leave

Every car as it starts out on the line after midnight on Sept. 14 will carry dash signs, front and rear, reading:

Enter Front
Exit Rear
Pay as You Leave

these signs being of letters of sufficient size to be easily read by persons on the sidewalks.

Three million leaflets, separated as to lines, have been printed, bearing the zone points. These were placed on the cars beginning Sept. 1. On the reverse side of each leaflet appears information as to the method of boarding and leaving cars, use of zone checks and zone indicators and the fare rates. These leaflets are being supplied in receptacles on which the sign "Take one" appears, and overhead signs reading "Zone limit leaflets in boxes; Take one," supplement the signs on the boxes.

As another means of acquainting the public with the operation of the zone plan, moving pictures were taken under actual operating conditions, showing each step the passenger takes boarding cars, getting zone checks upon entering, paying fare and leaving car. Views of zone points showing poles, and "close-ups" of zone checks, zone indicators, and the method of fare registration were taken, and the whole story in proper sequence will be shown in moving picture houses so far as is possible throughout the State before the plan becomes effective.

The newspapers have been kept informed of the news features of the new plan and stories have appeared illustrating the use of the zone check and telling the procedure of the riders on and after Sept. 14. There will be forthcoming additional matter to describe various features of the plan, such as the location of places where strip tickets may be purchased, new forms of school tickets in such parts of the system where these are in use, and the operation of pay-as-you-leave terminals where the same are to be established at congested points.

Briefly, the plan provides that passengers will board by the front door and that the motorman will issue a zone check as illustrated. This check is torn from a holder to indicate boarding point and on the reverse side for convenience there is tabulated the fare to succeeding zones. Fares are paid on leaving and rung up on a cash register.

Paris Tramways in War Time

Municipality Has Shown Reluctance to Give Real Aid to Tramways for Lightening War's Burdens

THE large part which Paris played in the European War and its dangerous nearness to the battle lines caused the life of its tramways to be eventful. A general description of the experiences of the Parisian surface and rapid transit lines during war time is given in a recent issue of the *Electric Railway & Tramway Journal.*

The outbreak of the war was promptly followed by Paris being deprived of all its motor omnibuses, in which a large section of the French army was rushed to the front. Thereafter Paris was subjected to almost innumerable air raids by Zeppelins and Gothas and, later on, to long-distance bombardment. These attacks naturally kept the nerves of the inhabitants on edge and interfered with the performance of electric railway service. Despite these attacks, however, and the drastic recruiting for the army, a highly creditable service was rendered by the tramways and (in due course) by the motor buses after the initial shock had been survived.

Rising Cost Hit All Lines

Most of the surface transportation service of Paris is carried on by the Compagnie Générale des Omnibus de Paris, which pays to the city an annual rental and a fixed proportion of its receipts. This company was entrusted a few years ago by the city authorities with a big scheme of tramway reconstruction and extension. It had to reconstruct all the tramways within the central area on the conduit system, and outside that area on the overhead system, thus abolishing the compressed air, accumulator and steam traction previously in use. This scheme of reconstruction had not been completed when the war broke out.

In spite of the difficulties involved, however, the company re-established and maintained its tramway services and four lines of motor omnibuses. For the rolling stock, etc., requisitioned by the government the company received an indemnity of $893,890.

Like other railways, it is said, this company has suffered during the last few years from the high prices of labor, fuel and materials. The public administration, in spite of the suggestions of the ministry of public works, has tried to hide its responsibilities behind a proposal which the company summed up in these words: "It is proposed that the companies should borrow eventually the capital repayable after the war, at 6.81 per cent per annum, so as to permit them to lose the money in operations conducted at a loss."

The official figures for 1918 have not yet been issued, but those for the preceding three years follow:

	1914	1915	1916	1917
Revenues	$8,762,807	$5,237,266	$6,147,803	$7,349,208
Working expenses.	7,349,577	3,651,876	4,892,324	6,040,020
Net revenues.....	$1,413,230	$1,585,390	$1,235,479	$1,309,182

That the financial results for 1914, it is stated, were not poorer was due to the progress made in the first seven months before the war broke out. The revenues for the year, however, were $2,984,026 less than in 1913.

The Compagnie du Chemin de Fer Metropolitain, which operates the rapid transit lines in Paris, had its full share of troubles after the outbreak of the war, not the least being those arising from disagreement with the city of Paris. Throughout the war period the company's receipts continued to rise, the increase for 1916 being 13 per cent above the best pre-war figures, and for 1917 19 per cent over 1916. The higher costs of coal, labor and materials, however, were such that despite an increase in receipts of $2,500,000 the net benefits decreased by nearly $200,000. The total receipts in 1917 were $14,278,149, and the expenses $7,272,258. The city of Paris took $4,765,220. The rapid transit traffic in 1917 amounted to 398,241,116 passengers.

It is suggested that one of two plans is now reasonably realizable: (1) An increase in fares that will cause the passenger to pay the increased cost of transportation, or (2) a modification of the rights of the city so as to make it share the higher expenses. The public administration and the Municipal Council have been sheltering themselves behind the stipulations in the company's concession, but the company asserts that the theory of the "unforeseen" is plainly applicable to the situation.

The city at one time agreed, under certain conditions, to advance money sufficient to enable the company to pay dividends not exceeding 4 per cent, the advance to be repayable after the war with interest. The company, however, saw no advantage in accepting a proposition which meant simply that it would find itself eventually face to face with the city instead of private financiers.

War-Time Progress in Swiss Railroad Electrification

A CORRESPONDENT of the *Engineer,* London, writes to that paper that Switzerland has begun to prepare for the electrification of her railways much more earnestly than ever before. During the war it was impossible to do much and even the electrification of the Gothard line, which ought to have been complete by now, can hardly be finished for two years. Some idea of the enormous cost of the electrification in Switzerland at present is given by the figures in connection with the line from Berne to Thun, not quite 20 miles in length. This is so far advanced that electric trains may be able to run over the entire distance long before. The cost has run to nearly $47,000 per mile, not including generators, etc. This line adds a link to the chain of already electrified lines, for at Scherzligen it joins the Lötschberg line which has always been electrified. When the Berne-to-Thun line is completely electrified it will be possible to go from Berne through the Simplon tunnel to Domodossola by electric traction. As Italy is pushing the electrification of the stretch from the latter point to Milan, if the eastern railways of France consider it to their advantage to use the Lötschberg Line for Franco-Italian traffic it is possible that the line from Delle to Berne via the Grenchenberg tunnel will be one of the next to be electrified.

Even with the present high cost of materials and labor it is calculated that it would be cheaper to use electricity on the railways than to continue with steam, as coal costs in Switzerland about eight times as much as before the war. Before the war the German coal mine owners did their utmost to put difficulties in the way of electrification of the Swiss railways. Now one of the great arguments in favor of it is that it would free Switzerland from dependence upon foreign nations for its coal supply.

Fireproof Construction for Substations

Program for Construction of a New Type of Substation as Inaugurated on Pacific Electric Lines in Southern California

BY C. A. ELLIOTT

Cost Engineer, Maintenance of Way Department, Pacific Electric Railway, Los Angeles, Cal.

DURING 1918 the Pacific Electric Railway undertook the construction of several new substations at locations where they were most needed on its lines. The first was erected at Wilmington Junction where three of the company's lines converge. These are the San Pedro main line, the Long Beach-Wilmington line and the City of Los Angeles Municipal Harbor belt line. This belt line serves several large shipbuilding plants as well as many other industries and warehouses located at Los Angeles Harbor, which was formerly known as San Pedro Harbor. Wilmington Junction is 2.6 miles from San Pedro Harbor.

The type of substation construction employed in the past was brick. The new type is also brick construction but the exterior walls are plastered and sand-finished and the construction is fireproof throughout. The roof is of reinforced concrete.

The building is 47 ft. 10 in. long, 32 ft. 10 in. wide and 23 ft. high from floor level to bottom chord of truss. The steel portions of the structure consist of two 32-ft. cross trusses and eight 8-in. channels for purlines, supporting the reinforced concrete roof.

Lighting and ventilation have received very careful consideration in these new structures. The windows with steel sash are placed at a sufficient height to give a good distribution of light. Louver galvanized-iron ventilators are installed at the floor level, and on the roof there are three 36-in. Swarthout ball-bearing rotary ventilators.

The equipment of this substation at the present time comprises a Westinghouse motor-generator set capable of carrying a load of 1000 kw. continuously and momentary swings up to 3000 kw. The energy is received from a three-phase circuit at 15,000 volts and feeds to the trolley line at 600 volts, direct current. The substation equipment is protected against lightning and other high-voltage surges by an electrolytic lightning arrester installed in the 15,000-volt alternating current line as it enters the substation. A lightning arrester is also installed in the direct-current feeder. For the present the substation will be manually operated, but later it will be converted for automatic operation.

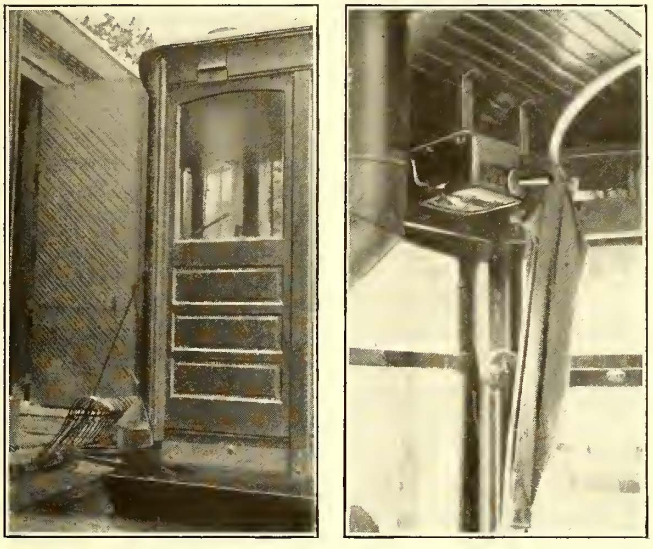
A substation building of the same type as that at Wilmington Junction has been erected at Slauson Junction, where the double-track Whittier line branches off from the four-track Long Beach main line. This substation will be automatically operated from the start, and the gallery has, therefore, been omitted in the building construction.

As there is great need of improvement in the power facilities at Los Angeles Harbor due to the heavy freight hauls and the frequent increases in passenger traffic, the construction of a new substation at San Pedro is to be undertaken immediately. In general this type of construction will be the same as at Wilmington. The building will be 70 ft. long, 36 ft. wide, and 24 ft. high from floor level to bottom chord of truss. Only two 36-in. Swarthout ball-bearing rotary ventilators will be installed in the roof of this structure, as ventilators are to be placed in the steel sash. As this substation will be manually operated, a gallery will be provided.

Plans have also been completed for the erection of a substation within a few months at Maple Avenue, Los Angeles, on some property adjoining the company's main terminal passenger station. More than 1800 electric interurban trains move to and from this terminal building daily and this new substation will considerably increase the power facilities for handling this extensive service. This substation will be of the same type as those already described and will correspond in dimensions to that of the large substation to be erected at San Pedro. This contemplated substation is to be automatic.

Open-Air Exhaust for Circuit Breakers

THE usual location of the circuit breaker on the car is above the motorman's head in the cab. Every time the motors become overloaded and the breaker operates there is naturally a flash and report which is often startling to passengers, especially those who may be standing on the forward platform. There have been occasions also when the blowing out of the breaker has thrown particles of carbon into the eyes and on the clothes of a passenger, and occasionally the motorman gets a hot spark down his neck which is not only annoying but may interfere with operation.



AT LEFT, OUTLET FOR CIRCUIT BREAKER FLASH AND REPORT. AT RIGHT, THE BREAKER IS SUSPENDED UPSIDE DOWN BY BRACKETS

To eliminate all of these objections the Des Moines City Railway is now relocating the circuit breakers on all of its cars so that the flash and report occur on the outside of the car. As shown in the accompanying illustrations the breaker has been turned upside down and suspended by brackets from the roof at the side of the vestibule. An outlet has been cut through the letterboard and lined with asbestos board. The outside shield shown in the illustration is light sheet iron lined with asbestos.

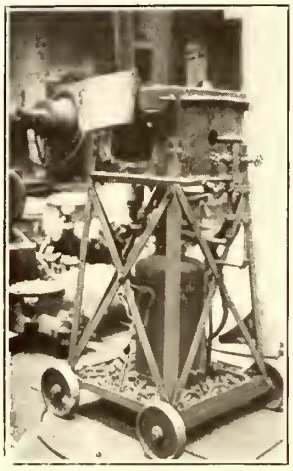
Eight or more cars have had the breaker relocated in this manner at present. When the cars come into the shop for repairs or overhauling this change will be made until the entire system is changed over. The new arrangement has worked very satisfactorily.

Portable Rivet Heater for Shop Use

Des Moines City Railway Has Built Portable Equipment for Use in Any Part of Shops—Burns Kerosene and Is Great Time Saver

RIVETING has to be done in many parts of the ordinary railway shop. A forge is generally available only in the blacksmith shop so it becomes necessary to do one of two things, either take all riveting work to the blacksmith shop or devise some portable heating equipment so that the work can be done wherever it is most convenient. The Des Moines City Railway favors the latter method and has designed and constructed a portable forge or rivet heater.

The stand of the heater is built up from 1½-in. x 1½-in. angle corner posts cross braced by ¼-in. x 1¼-in. iron straps. The bottom angles are the same size as the corner posts and the floor is No. 12 sheet iron. The fire box is built of fire brick lined with fire clay mixed with common salt and the whole is incased in No. 12 gage sheet iron. The fire box rests in 1½-in. x 1½-in. angles bolted the corner posts and these latter extend about half way up the sheet iron sides of the fire box and are bolted to them. The top of the box is clamped as shown in the illustration, but a better method would be to carry the angle-iron corners all the way up and fasten the ends with angles in the same way that the bottom of the box is supported. The heater complete is 4 ft. 5 in. high, 44 in. square at the base, 18 in. square at the bottom of the fire box and 17 in. square at the top. The box is 15 in. high.



PORTABLE RIVET HEATER MADE AND USED IN DES MOINES SHOPS

The fuel tank is of 10 gal. capacity and was part of an old pre-heater equipment. Kerosene is used as a fuel. There are four pipes in the top of the tank, the one shown at the left with a valve is for filling purposes. The second is for attaching the hose line from the shop air connection which forces air into the tank at 90 lb. pressure. The air outlet through the top is a ½ in. pipe and in addition there is an exhaust pet cock. The oil-supply line consists of a ⅜-in. pipe which enters the tank near the bottom. Both the air and the oil lines are equipped with valves for the proper adjustment of the mixture necessary to give the desired heat. The two lines merge near the nozzle which throws a flame of intense heat through an opening in the side of the fire box. An auxiliary air line of ⅜ in. pipe extends around to the front of the box and is perforated under the door opening. By adjustment of the valve this air keeps the flame within the fire box. It will be noticed also that there is a shield to protect the face of the operator when rivets are being inserted or withdrawn.

This equipment is mounted on four solid-cast wheels 8 in. in diameter and is easily wheeled about the shop by one man. The use of the heater is confined mainly to rivet work but it is used also for heating bushings for G.E. Nos. 57 and 67 motors and other similar work. Air connections are conveniently placed throughout the shops and by means of an ample length of hose the heater can be used in practically any location. It has been a great time saver and convenience.

Swing of Radial Coupler on Curves

Formulas Developed for Use Do Away with the Necessity for Special Layouts

BY L. F. SEELAR
Chief Engineer St. Louis Car Company, St. Louis, Mo.

ONE of the conditions which has always been a source of much trouble and vexation to those engaged in the construction of electric cars is that of determining the swing of the radial coupler. The usual method is to employ special layouts, which are often very inconvenient and take a considerable time to make. Few draftsmen can readily figure the swing of the coupler, and in order to assist in such calculations, I developed the following formulas for this use. These formulas require only an elementary knowledge of trigonometry and the use of a table of squares similar to that of Smoley or Hall. When Smoley is used, the parallel table of logarithms greatly simplifies calculations.

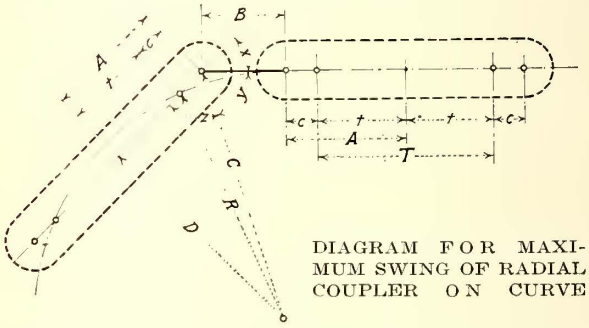


DIAGRAM FOR MAXIMUM SWING OF RADIAL COUPLER ON CURVE

Referring to the accompanying diagram, let us consider two cars, one of which is on a curve and the other car with the pivotal point of its coupler at the point of tangency. The maximum swing of the coupler occurs with the cars in this position.

Let

A = Distance from center of car to pivotal point of coupler
B = Length of two couplers
R = Radius of curve
T = Truck centers
t = One-half truck centers = $\frac{1}{2}T$
c = Distance from center of truck to pivotal point of coupler
X = Maximum swing of coupler

Then

(1) $D = \sqrt{R^2 - t^2}$

(2) $C = \sqrt{A^2 + D^2}$

(3) $Z = \text{Tan}^{-1}\frac{D}{A}$

(4) $Y = \text{Cos}^{-1}\frac{B^2 + C^2 - R^2}{2BC}$

(5) $X = 180° - (Z + Y)$

To show the application of these formulas let us consider a case with A = 19 ft. 10 in., B = 9 ft. 10 in., R = 35 ft., t = 14 ft. and C = 5 ft. 10 in.

Then from formula (1) D will be 32 ft. $1\frac{5}{16}$ in. and from formula (2) C = 37 ft. $8\frac{9}{16}$ in. Z will be 58 deg. 16 min. 11 sec. and Y will be 66 deg. 5 min. 20 sec. X will then be 55 deg. 38 min. 29 sec.

Association News

ATLANTIC CITY CONVENTION, OCT. 6 TO 10

Convention Exhibit Notes

SECRETARY BURRITT has written to all member companies calling attention to the unusual activity among the manufacturer members in preparing for exhibits, and recommending that delegates be prepared to spend as much time as possible in making a systematic study of these exhibits. To assist delegates in preparing permanent reports of their observations, the exhibit committee will distribute a combined directory and notebook. A full page in this book will be assigned to each exhibitor, on which his name and address will be printed and a description of his exhibit given. Names will be alphabetically arranged and exhibit space numbers indicated.

The entertainment committee has formulated final plans for the entertainment part of the program. Subcommittees are at work making arrangements for music, etc. One evening will be set aside for a dance and another evening for a carnival. During these evenings special features will be introduced by professional dancers and other performers. Arrangements have also been made for daily aeroplane flights at a reasonable fee.

Engineers and electric railway contractors are showing appreciation of the Hall of Engineers; a new feature this year.

Manufacturers Draft Constitution for Affiliated Association

A MEETING was held at Association headquarters on Sept. 3, of the committee appointed by the American Association to draft a form of organization for a proposed affiliated association of manufacturers. Those present were Thomas Finigan, Chicago, Ill., Chairman; S. M. Curwen, Philadelphia, Pa.; E. D. Kiburn, New York City, representing Guy E. Tripp; E. B. Burritt, New York City, and H. H. Norris, ELECTRIC RAILWAY JOURNAL, representing James H. McGraw.

The committee put the finishing touches upon a draft of a constitution and by-laws, which had been prepared earlier in the year. This will be put into the hands of manufacturer members of the association for consideration in advance of the convention.

Canvass on Wages and Labor Conditions

THE bureau of statistics and information of the American Association is collecting first-hand data regarding the wages and labor situation. A bulletin will be issued at once showing name of company, wage scale and date in effect. The information requested on working conditions will be tabulated and kept on file for the use of companies on request. Data Sheet No. 193 is being used in collecting the information. In connection with the questionnaire some attention is also being given to traffic conditions in so far as they affect labor and wages.

The subject covered by this canvass is in such a state of flux that the compilation of data is difficult. The association, therefore, requests prompt co-operation in the return of the sheets. This is doubly timely and important in view of the coming hearings before the Federal Electric Railways Commission at which the labor and living conditions in the industry will be presented by the Amalgamated Association.

Letter to the Editors

Stimulating Sales of Metal Tickets

BROOKLYN, N. Y., Sept. 3, 1919.

To the Editors:

In a certain town, whose name I prefer not to mention, it became necessary in the course of distressing events to raise the fare from 5 cents cash to 6 cents cash. At the same time, the 6-for-25 ticket went into the discard. The immediate result—nay the permanent result—was a terrific drop in noon-day riding to and from the largest factory in the city. Yet the men employed in this factory were highly-skilled mechanics whose wages had risen far more than the rate of fare.

This unhappy result surely was the consequence of a mistake in psychology. These men did not resent paying an increased fare so much as they resented being deprived of a little discount from whatever happened to be the established rate of fare. As four-time-a-day riders instead of two, they held that they were entitled to a little cut from the figure established for the casual rider—all the more so as they knew that much of the noon-day riding cost the railway less than regular rush-hour service.

To raise and lower the fare at one and the same time seems a queer performance, but it is good business if properly stimulated. The trouble with most companies that claim that they cannot see any good in selling the metal ticket at a discount is that they have never really tried intensively to sell such tickets. When we find only 10 or 15 per cent of the riders offering tickets, we may be certain that little publicity has been given to putting the metal ticket over. Thus, instead of relieving the conductor of the worries that the odd fare has added to his platform life, such systems simply make him fill out a couple more blanks on his trip sheet for the occasional metal ticket that some passenger offers in much the same spirit as a person passes counterfeit money. It was my experience recently to enter a waiting room and, upon offering to purchase metal tickets, to be gazed at in wonder and to be told that "they hadn't had any sales in weeks!"

It seems to me that two things are necessary to get all the good that there is in the metal ticket: First, to sell the tickets in packages at a price averaging ½ cent below the cash rate; second, to place the tickets in every store that will handle them as a convenience for customers, backing up this campaign by a series of placards that will emphasize both the saving and the convenience. When at least 50 per cent of the riders present metal tickets, the railway can say that it has really tried to sell them; otherwise it has failed to use the one best means of saving platform time and minimizing fare losses since the 6, 7, 8, 9-cent, etc., fare came into our disturbed midst.

A BELIEVER IN TRANSPORTATION SALESMANSHIP.

Recent Happenings in Great Britain

Important Legislative Measures Still Before Parliament—Orders Placed in America for Rails Provoke Discussion

(From Our Regular Correspondent)

The two great legislative measures of the government which have a direct bearing on transport are still struggling through Parliament. The Ministry of Ways and Communications bill completed its course in the House of Commons before the middle of July, and as a result of concessions made by the government the third reading was agreed to without a division. These concessions are chiefly in the direction of limiting the powers of the Minister, the most notable being in connection with docks and harbors.

A Warm Reception

When the bill came before the House of Lords toward the end of the month it met with a very hostile reception. Bureaucratic control and nationalization were the principal scarecrows which were vigorously waved about, and a strong demand was made that the operation of the bill should be confined to railways only. A second reading was granted, however, without a vote being taken, and the government solemnly warned the militant peers against making any attempt to put a knife into the bill.

A little later a party in the House of Lords attempted to have the bill divided into two bills, one dealing with railways and the other with other means of locomotion, and the former to be dealt with immediately and the latter postponed. This wrecking proposal was defeated by a two-to-one majority. The committee stage of the bill was concluded early in August and several changes were made against the wishes of the government. Any which the latter consider vital will doubtless be rectified by the House of Commons, and the bill will probably pass into law about the middle of the month.

Electricity Bill Dragging

Protracted proceedings on the electricity supply bill went on during July. The measure was before a standing committee of the House of Commons and an enormous number of amendments were discussed. For some time the bone of contention was where district electricity boards to take over and operate the power stations and to provide new ones should be constituted for each district into which it is proposed to divide the country. There was no objection to the setting of the general administrative body called the electricity commissioners, but much was urged against compulsory district boards. The government offered a compromise under which district boards should only be formed where authorized undertakers and local authorities failed to produce a satisfactory scheme themselves. This was agreed to. The alternative bodies are to be called joint electricity boards. Another change of importance, this one being made at the instance of the government, was to exclude existing railway (as distinguished from tramway) power stations from the operation of the bill. Such stations will accordingly not be transferred to the districts boards. Early in August the committee on the bill adjourned till after the summer recess. The resumption will be in October or November.

The prospective heads of branches of the Ministry of Ways and Communications are largely railway men. The consultant mechanical engineer is Sir John A. F. Aspinall, formerly general manager and now a director of the Lancashire & Yorkshire Railway. On the system he has had much experience with electric traction. The regular acting head of the mechanical engineering department is Lieut.-Col. L. Simpson, D.S.O., R.E., late traction superintendent of the Buenos Aires & Pacific Railway. Sir Philip Nash, who is at the head of the traffic department, was assistant manager of East Indian Railway. Statistics and accounts are to be under the charge of Sir J. George Bacharrell, D.S.O., assistant goods manager of the North Eastern Railway. The secretarial and legal work will be managed by Sir Francis Dunnell, secretary and solicitor of the North Eastern Railway. H. G. Burgess, traffic manager for Ireland, of London & North Western Railway, will be director of Irish transport.

Mr. Dalrymple a Dissenter

An example of one of the tramway problems likely to arise under the ways and communications bill after it has become an act is furnished in a memorandum prepared by James Dalrymple, general manager of Glasgow Corporation Tramways. In this he gives some facts relating to the Glasgow tramway power station and points to questions which would arise if the station is taken over in connection with the national power scheme. The load is carried by three turbo-generators of a total capacity of 14,000 kw. and the whole plant is more than ordinarily efficient. The station, distribution system, and substations cost together £1,200,000, but the whole of the capital has been repaid and current is produced simply at works cost. If the station is taken over the Council will have to consider what sum it should receive and at what rate the tramways should be charged for current by the new authority. It would be very bad business to scrap such a fine station. The taking over of the high-tension distribution system is strongly opposed by Mr. Dalrymple, as the high-tension and the low-tension feeders must be operated by the same authority.

There are a number of other large efficient tramway power stations in the country which are in a similar position to that of Glasgow except that in their case the capital has as yet been only partially repaid. In the case of a still larger number the problem will be further complicated because these stations have lighting and general power loads as well as tramways to provide for. The whole future under the national power scheme is in fact very misty, and it must remain so until the new Ministry has been at work for some time. In the committee on the electricity bill recently some reassurance was given to tramway authorities by the government. If and when their power stations are taken over municipalities will have the option of receiving annuities to discharge the outstanding indebtedness on the stations, or of receiving a sum representing cost less depreciation.

Labor Outlook Uncertain

The labor unrest, ever-increasing wages, shorter hours, a serious coalminer's strike in Yorkshire, and an increase in the cost of coal of 6s. per ton are having their serious effect on electric traction as well as on other undertakings. The future is not at present bright.

One or two authoritative figures were given by the Board of Trade in reply to a question in the House of Commons on July 17 regarding the order by the Glasgow Corporation to an American firm for 5000 tons of tramway rails. Mr. Bridgeman, for the Board of Trade, stated that the order was placed abroad because home firms were unable to deliver the rails in time for the necessary renewals of track which had to be carried out before winter. The difference in price between the American and the lowest British tender was more than £10,000, and the American company undertook delivery at an earlier date. The value of the contract was more than £100,000,

London Order for United States

Early in August some talk arose over the fact that the London United Tramways had also ordered rails from America, but as this was a case of a company, and not a local authority less was said about it. The company has bought 2500 tons of rails from the United States Steel Products Company at a price including delivery of about £40,000. Only one British tender was received, and though it was not much higher than the American one there was a stipulation for raising the price should the cost of labor increase. The British offer also could not promise delivery on a definite date.

Under an arrangement come to between the two tramway associations and the National Transport Workers' Federation, tramway employees on duty on July 19 (the peace celebration day) were paid double time and were granted an extra day's holiday with pay.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

Advises Taking Over G. T. R.

Sir Adam Beck, Head of Electric Commission, Urges This as Advantageous to Government

In addressing a meeting of representatives of municipalities, to the number of seventy-five, from Western Ontario, at Stratford, Ont., on Aug. 29, Sir Adam Beck, chairman of the Ontario Hydro-Electric Commission, advocated the taking over of the system of the Grand Trunk Railway and its electrification as a public utility.

The occasion of the meeting was the formal opening of the Stratford municipal electric power station and the remodelled waterworks. Sir Adam recalled that Stratford was one of the original twelve municipalities that entered into the contract when the Niagara power scheme was first broached.

Giving figures for the activities of the Hydro Commission, Sir Adam spoke of twelve systems now being operated by the commission, serving in all 234 municipalities, developing 336,000 hp. He also spoke of the Chippewa government undertaking and said that the original plan calling for the initial 200,000 hp. at Niagara Rapids has been changed to double the quantity, so that 400,000 hp. will be developed at that point.

In speaking on the subject of hydro radials, Sir Adam said that no action would be taken to parallel the Grand Trunk Railway tracks until the question of taking over the railway was settled, but that surveyors were at work estimating the costs, so that work could be rushed when a decision was reached. He quoted the London-Port Stanley line as an example of a municipally-owned road that was paying its way handsomely.

Sir Adam stated that making electricity readily available for domestic use would have a great effect on farm life, in the keeping of young people on farms and getting people back to the land. He thought 100,000 hp. could be sold in six months time if the commission had it to furnish to customers.

Jackson Lays Down Franchise Terms

The City Commission of Jackson, Miss., has declined to adopt a franchise for the Jackson Light & Traction Company submitted for a prospective purchaser of the property, which is now in the hands of a receiver. The Mayor and the Commissioners say, however, that they are willing to adopt a franchise which conforms to the one now in existence. They argue for a valuation basis of less than $1,000,000 for the property. The Mayor said:

It was shown on the trial in the Federal Court that, while the value of the company's property was less than $1,000,000, the company has issued, not upon the value of its property, but upon its earning capacity, $930,000 of first mortgage bonds, $216,000 second mortgage bonds, $140,000 of promissory notes, $600,000 of preferred stock, and $1,000,000 of common stock, or about $3,000,000 of total capitalization, and upon which interest and dividends were to be paid, and upon which stock, to the sacrifice of maintenance, dividends have heretofore been paid. If the rates upon gas or electric lights, or the railway are deemed by Mr. Grossman, if he concludes his purchase, to be too low, the city would consider an application touching an increase or application could be made to the Railroad Commission of Mississippi to fix rates for the railway.

An Interurban Manager on the Interurban Outlook

Charles J. Finger, receiver and general manager of the Columbus, Magnetic Springs & Northern Railway, Delaware, Ohio, contributed a letter to the *New Republic* for Aug. 20 on "The Passing of the Interurbans." Mr. Finger apparently sees clearly the inexorable law of the survival of the fittest hard at work in the transportation field, with the prospect of many small roads being pushed to the wall by the auto. After reviewing the passing of the turnpike companies, supplanted by the steam railroads, Mr. Finger says in part:

To-day the interurban electric lines and some short steam railroads are in much the same position that horse transportation companies were in then. They are being pushed aside in great measure, by the automobile and the truck in rural communities.

An examination of electric railroad statistics of passengers carried reveals the fact that, with war service eliminated, the past six years have shown a steady decrease in the number of revenue passengers carried.

During the past two years, many railroads, both electric and steam, have surrendered their charters and ceased operation. In Ohio at least eight roads have vanished from the map, and others must follow. Nor does it seem that the communities which these roads served have suffered. Where small villages have been left railroadless, auto bus lines have been established.

Obviously then, to attempt to persuade those in Washington that the plight of the interurbans can be bettered by an increase of rates, is foolish. Such an increase would only serve still further to decrease patronage, and exacerbate the troubles complained of, by driving still more people to the automobile and truck.

The probable outcome will be that the interurban will be replaced by the more serviceable automobile, with its cousin, the auto truck. Such interurbans as operate between cities of considerable population will survive, but even they cannot, without ultimate disaster, raise their rates to any appreciable extent. Their hope is in economy, but not that false economy that makes for inferior maintenance. Revenue could be increased by selling current to farmers along the right-of-way. Old ties and bridge timbers, poles and posts, could be sold for fire wood, instead of being burned. Finally, bondholders, who in small interurbans are more often than not the owners, should voluntarily reduce their holdings, and thus lighten the burden of interest payments.

Pittsburgh Men Return

Accept War Board Award "Under Protest"—Men Apparently Glory in Their Shame

After a two weeks interruption of service, Pittsburgh's striking railway men returned to their posts the morning of Friday, Aug. 29, accepting "under protest" the 6-cent raise awarded them by the War Labor Board, against which they had struck in violation of their contract.

Decision to acknowledge defeat was reached by the men at a mass meeting on Thursday afternoon, Aug. 28, at which the impossible situation their conduct had thrust them into was pointed out to them in vigorous terms by William B. Fitzgerald, international vice-president of the Amalgamated Association. The terms upon which the strikers returned to work are:

That all should be reinstated to their former positions and seniority. (Exception: Men against whom informations have been lodged to be dismissed if convicted.)

That the contract prevailing on and prior to Aug. 14 shall be reinstated

That the receivers drop their suit against the men for $900,000, claimed as damages suffered by reason of an unlawful strike.

This basis of agreement was reached after numerous conferences on Aug. 28 between the receivers of the railway and the wage scale committee of Division 85, with whom Mr. Fitzgerald sat.

The spirit of the meeting at which the strikers finally voted to return to work made plainly evident that they were not persuaded to do so by any feeling of repentance for their outrage of their contract.

Mr. Fitzgerald informed the receivers before leaving Pittsburgh that he would reopen negotiations shortly to obtain for the men the full wage demanded in the case submitted to the War Labor Board—a 12-cent advance. The receivers did not commit themselves on this proposition, but no one has any idea they will concede anything.

Altogether the strike and the two weeks suspension of service is estimated to have cost Pittsburgh about $15,750,000, divided as follows:

Loss of business by mercantile enterprises	$14,000,000
Loss to travelling public as result of being forced to ride in jitneys and trains	750,000
Loss to Pittsburgh Railways	750,000
Loss to men in wages	250,000

The strike breakers brought in by the company, whose first and only attempt to operate cars brought on riots, as described in the ELECTRIC RAILWAY JOURNAL of Aug. 30, were shipped out immediately after the strikers voted to return to work, and before the first cars were taken out. No further trouble occurred.

Spokane Men Abide by Agreement

On the advice of the international union, the platform men of the Spokane Traction Company, controlled by the Spokane & Inland Empire Railroad, unanimously voted recently to reject the appeal of the striking shopmen, machinists, blacksmiths and electricians for sympathetic support, holding that their contract with the company, under which they were granted an increase of wages several weeks ago, barred them from walking out.

Conductors and motormen in the employ of the traction division of the Inland system have not changed their attitude as to the strike on the Inland because of the adverse decision of their claims for back pay, filed in the Federal Court by Oscar Cain, master in chancery in the receivership case. According to Everett J. Parker, president of the local union, the platform men will continue on the job and in the meantime prosecute a further effort in the Federal Court to secure back pay.

In the decision of the master in chancery the claims of the Inland employees are not only denied priority, but are entirely disallowed as valid claims against the company. Failure of the company to pay the back wages, based on an award or recommendation by the Federal War Labor Board, is one of the things that brought on the strike.

The special committee appointed by the Central Labor Council to investigate and report on the request by the striking Inland employees that the company be placed on the unfair list, rejected the request for emergency action by a vote of four to one. They will refer the matter back to the Central Labor Council, where it is to come up for discussion.

Ottawa Electric Railway Wages Settled

The dispute between the Ottawa (Can.) Electric Railway and the union of employees has been settled. A wage scale for motormen and conductors has been accepted by both parties which carries the following pay per hour:

First-year men	39 cents
Second-year men	41 cents
Third-year men	43 cents
Subsequent years	45 cents

The new arrangement took effect on Aug. 1. The conciliation board which had been appointed automatically went out of existence.

The new agreement regarding wages and working conditions between the company and its employees has been signed by all parties. It confirms the new wage scale as announced some time ago. The agreement is not a majority report of the conciliation board, but is the agreement reached between the company and its men on July 25, without the aid of the board of arbitration. There will be no report from the conciliation board, its functions having ceased when an agreement was reached between the two parties.

The company guarantees that no discrimination will be used against any man in its employ because he belongs to an association or union of employees.

London Traffic Committee Reports

The report by a committee of the House of Commons which had been inquiring into the problem of London traffic congestion was issued in the end of July, and locally, at least, it has caused some little sensation. The report savors more of modern daily journalism making a case than of the calm, judicial, well-thought-out type of document to which one is accustomed in the case of Parliamentary committees.

The main recommendation is in principle only a repetition of that of the Royal Commission of 1905—namely, the formation of a traffic board for London to control and co-ordinate all public means of locomotion and to develop and extend them. Dispute will arise as to the proposed composition of the board, especially in regard to the recommendation that the London County Council should be represented on it, seeing that the body as the owner of tramways is an interested party. The wisdom of the committee may be judged by the fact that one of its recommendations is that fares should be reduced. Apparently congestion is to be diminished by encouraging people to ride by means of cheapening fares. And this at a time when most undertakings are in difficulties despite increased fares.

Wages Increased in Texas

The Dallas (Tex.) Railway has granted a wage increase of 4 cents an hour for all conductors and motormen. This makes the scale from 42 cents to 46 cents an hour. During the first three months men are paid 42 cents an hour; for the next nine months they receive 44 cents an hour, and thereafter they will receive 46 cents.

Wage increases for conductors and motormen of the Galveston-Houston Interurban Railway, the Houston Electric Company and the Galveston Electric Company, have just been announced. The new wage scale will be from 42 cents to 46 cents an hour.

The Eastern Texas Electric Company, Beaumont, Tex., has granted an increase of 4 cents an hour for its conductors and motormen.

M. J. Loftus, superintendent of the lines in Sherman, Tex., owned and operated by the Texas Electric Company, Dallas, notified the motormen and conductors that they would receive an increase in wages of 4 cents an hour, making the scale 42 cents to 46 cents an hour, instead of 38 cents to 42 cents.

The El Paso (Tex.) Traction Company has announced a wage increase for trainmen amounting to 2 cents an hour. The new scale will run from 42 cents to 46 cents an hour.

In every case the new rates are effective from Sept. 1.

Vancouver Men Present Demands

The railway employees of the British Columbia Electric Railway, Vancouver, B. C., on Aug. 8 submitted a proposed new wage schedule together with notice of the reopening of the present agreement, which will, therefore, automatically expire thirty days from that date. The new scale for city motormen and conductors as proposed by the men is 55 to 65 cents an hour, reached in twelve months in place of 40 to 51 cents an hour reached in eighteen months. For interurban men the proposed scale is 65 to 69 cents reached in twelve months instead of 40 to 53 cents, reached in eighteen months.

A totally new provision is for the payment of 70 cents an hour to city motormen and conductors on night runs, which the men propose shall be those after 6.30 p.m., except when completed before 8.30 p.m.

The proposed agreement provides for a guarantee of an eight-hour day for week days, and six hours for Sundays, instead of a minimum of six hours on week days under the old contract. The spread is proposed to be reduced from eleven hours to ten hours.

Under the terms of the old agreement, either party could reopen it on giving one month's notice. It will, therefore, be necessary to come to some conclusion before Sept. 8. The matter will in all likelihood go before an arbitration board under the Lemieux act.

M. O. Proposal Defeated

On Aug. 11 the ratepayers of Guelph, Ont., by a majority of 437, defeated the proposed agreement between the city and the Grand River Railway (controlled by and operated in the interest of the Canadian Pacific Railway), providing for the taking over of the local railway line and making an extension to Puslinch Lake and Hespeler to connect at the latter town with the present system of the Grand River Railway (formerly the old Galt, Preston & Hespeler Railway).

The campaign was an exciting one, in view of the fact that while the citizens at first were in favor of giving the Canadian Pacific Railway the right to take over the local railway line and obtaining much-needed connections with other towns, the Hydro-Electric Commission was opposed to the agreement, perceiving that it would place the Canadian Pacific Railway in a strategic position by giving to the railway surface rights over the streets of Guelph and handicap the present projected Ontario Hydro Radial Railway system, which is to cover western Ontario from Niagara to Toronto and to Windsor.

Following the vote on Aug. 11 Sir Adam Beck, chairman of the Hydro-Electric Commission, received an invitation from the railway and manufacturers' committee of the City Council of Guelph to be present at a meeting to be held there on Aug. 21 to consider the prospects of an electric line from Guelph to Hespeler.

Puget Sound Will Use Electricity from Spokane

Electric energy from Spokane is now penetrating every part of the vast electric distributing system of the Stone & Webster interests from Tacoma on the south to Everett and Bellingham on the north. The Washington Power Company transmits the energy to the Coast by means of the transmission lines of the Intermountain Power Company. The latter company carries the power from Long Lake to Taunton on the Milwaukee, where it is retransmitted to Cedar Falls and then to Snoqualmie, where it is fed into the whole Puget Sound electric distributing system.

The Intermountain Power Company is the company which buys power from various power companies and sells it to the Chicago, Milwaukee & St. Paul Railroad, the Stone & Webster interests and other customers. From Taunton, the eastern terminus of the Milwaukee's Puget Sound electrification, current is carried into the Puget Sound country over the transmission lines of the Milwaukee Railroad.

The Puget Sound unit of electrification of the Chicago, Milwaukee & St. Paul Railroad between Taunton and Seattle and the Sound is ready for operation and during the winter the Milwaukee road plans to operate all its transcontinental trains from Taunton to Seattle, Tacoma and way points by means of electricity.

The contract with the Washington Water Power company is a permanent affair. The company agrees to furnish power to the Intermountain Power Company, which transacts the commercial business with the Coast concerns and the Milwaukee.

From Long Lake to Taunton the distance is 112 miles; from Taunton to Cedar Falls, 139.2 miles; from Cedar Falls to Snoqualmie, 10.6 miles, making a total of 262 miles before the Spokane-generated power reaches the distributing system of the Puget Sound country.

Safety Cars Legalized at Terre Haute

Ordinances are no novelty which forbid the operation of one-man cars, but one is which expressly stipulates their use. Such an ordinance was passed by the Common Council of Terre Haute, Ind. By it the Terre Haute, Indianapolis & Eastern Company is permitted to run Birney safety cars in accordance with the American Car Company's specification No. 100. The first installation of these cars was described in the issue of this paper for June 28, through the courtesy of E. M. Walker, general manager. The exact wording of this ordinance follows:

Whereas, the city of Terre Haute has requested the Terre Haute, Indianapolis & Eastern Traction Company to improve the street car service in said city, and in response thereto said company has undertaken to comply with the city's said request in that behalf. said company in a written communication has advised the city that it has conditionally arranged for the purchase and use in the said city of thirty (30) new street cars of the type commonly known as the quick service or safety cars, which are particularly described in the American Car Company's specifications No. 100 and in such specifications called the Birney safety cars. Believing that it is in the public interest the city desires to meet the conditions specified in said company's communications respecting such matter, reference to which is hereby made. Therefore:

Section 1. On and after the adoption of this ordinance by the Common Council of the city of Terre Haute and the approval thereof by the Mayor of said city it shall be lawful for the Terre Haute, Indianapolis & Eastern Traction Company, its grantees, successors and assigns, to operate in, along and upon the streets of said city either exclusively or in connection with the use and operation of the type of street cars now and heretofore used and operated in said city, the type of street cars commonly known as the quick service or safety cars and of the general type designated by the American Car Company's specifications No .100 and particularly called the Birney safety car, with only one operative for each such car.

Section 2. All ordinances and parts of ordinances in conflict with the provisions thereof are hereby repealed.

Section 3. An emergency is hereby declared to exist for the immediate taking effect of this ordinance and the same shall therefore be in full force and effect on and after its adoption by the Common Council of said city and its approval by the Mayor of said city.

Dated, July 5, 1918.

Normal Service Resumed in Los Angeles

Both the Pacific Electric Railway, which gives interurban service in four counties and street car service in ten towns, and the Los Angeles Railway, which serves the major part of Los Angeles, Cal., were giving normal daylight service on Sept. 4 and substantially normal night service up to 10 p.m., with a promise of complete restoration within a week's time. The public is riding very heavily in full sympathy with the electric railways.

A mass meeting of twenty-three principal business organizations of Los Angeles and vicinity representing practically all commercial, industrial and manufacturing interests has pledged support to the electric railways and to the 200,000 working men in Los Angeles who do not belong to any union. The Labor Day union parade had 8700 men in line. There was little or no enthusiasm. Moreover, there was no violence of any consequence anywhere. The situation on the steam railroads, where there was a sympathetic demonstration in which the national administration took a hand, is again normal.

The strike was called in all departments of the electric railways, but the effect was not noticeable except in connection with motormen and conductors. The men who left work in the shops, substations, and electrical overhead departments were immediately replaced. The companies have stopped advertising for employees except motormen and conductors. The two companies are short only 20 per cent of the normal number now.

The chief lesson from the experience of the Pacific Electric Railway during the last year and a half is that steam line brotherhoods cannot be tolerated on electric railways. Their ideas as to wages and working conditions are impossible of fulfillment on lines that depend for their revenue chiefly on city and suburban fares and that must be operated in competition with private and public automobiles and motor trucks.

In the case of the Los Angeles Railway it has been demonstrated again that an electric railway cannot be half union and half individual and that in southern California the sentiment is 90 per cent against union domination. It has also been established that this sentiment is militant and willing to fight to maintain freedom from government by unions.

United We Stand; Divided We Fall

The Massachusetts Northeastern Street Railway, Haverhill, Mass., has addressed an open letter to its employees explaining briefly the weight of the high cost of living on the electric railway business. The employees are urged to interest themselves in the solution of the difficulties of the company and to help inform the public of the crucial situation. A condensed table of facts gleaned from the testimony presented at the electric railway hearings in Washington is presented to the employees in the open letter.

The management of the company declares in the statement that inasmuch as the United States government has recognized the principle that every business is entitled to a fair and just return on the money invested in the business, the electric railway must have this fair and just return or it cannot pay wages and upkeep. The final declaration of the management is:

If the authorities who control railway fares do not apply the same fair principle applied by the United States government to the steam railroads, the electric railways must quit business. The Massachusetts Northeastern Street Railway is one of the electric railways facing this situation. You as employees of the company are just as interested in the solution of our difficulties as is the company. If we lose our job, you lose yours, too.

Post-War Rehabilitation Program

The Interstate Public Service Company, operating between Indianapolis, Ind., and Louisville, Ky., is planning to expend from $350,000 to $500,000 as a part of its after-the-war rehabilitation. Bert Weedon, general freight and passenger agent of the company, states that the work of improvement will be begun at once. A central shop to cost about $100,000 will be built, but the location of this shop has not been determined. The establishment of a uniform voltage of 600 is contemplated to take the place of the present voltage of 600 and 1200. The company now plans to run freight trains of from five to ten cars each. A number of all-steel cars have been ordered for the company and additional limited service is to be provided, with probably one or two limited runs providing only one stop between Indianapolis and Louisville.

News Notes

Riot Insurance Taken Out.—The Cleveland (Ohio) Railway has taken out an insurance policy in Chicago, said to be the largest ever written, for $10,110,000 against "riot and civil commotion." The premium was $37,110.

Advance in Wages in Bristol.—Wages of the employees of the Bristol & Plainville Tramway, Bristol, Conn., were advanced 5 cents an hour, effective on Aug. 24. New men will receive 44 cents and older men 50 cents an hour.

Interurban Men Want More.—Trainmen of the Illinois & Iowa Railway at Clinton, Ia., are demanding an increase in wages from 40 cents to 90 cents an hour. Rules governing working conditions have also been drawn up for presentation to the company.

Wage Award Acceptable.—The award of the Public Service Commission of Missouri of a 45 per cent wage increase to employees of the United Railways, St. Louis, Mo., was read to the men at a union meeting during the week ended Aug. 30 and accepted.

Claim Made for Electrolysis Damage.—The Memphis (Tenn.) Telephone Company has filed a suit against the Memphis Street Railway in the Chancery Court to recover $3,700, which it claims represent damage to its cables due to electrolytic action of the railway return circuit.

Wage Increase Granted.—The Toledo, Bowling Green & Southern Traction Company, Toledo, Ohio, has granted a wage increase of 5 cents an hour demanded by the employees. About 200 employees between Findlay and Toledo are affected. Under the new rate they will receive 48 cents an hour.

Queens County Wages Increased.—W. O. Wood, president of the New York & Queens County Railway, Long Island City, N. Y., on Aug. 26 announced a voluntary increase of 25 per cent in the wages of the employees in the operating and transportation departments. Conductors and motormen who have been receiving 41 to 49 cents an hour will get 52 to 62 cents.

Banquet to Herbert Hoover.—The engineers of America, under the auspices of the American Institute of Mining and Metallurgical Engineers, will give a dinner to Herbert Hoover in New York, at the Waldorf-Astoria Hotel on Sept. 16, on the occasion of his arrival from abroad. W. L. Saunders is chairman of the banquet committee.

Wages Raised on Ohio Interurban.—The directors of the Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, a part of the old Cincinnati Street Railway, have granted demands of the employees for a wage scale of 48 cents an hour. The Town Councils of Bowling Green, Portage and Maumee had previously refused the company's request for an increase in fare.

Franchise Talk at St. Paul.—Upon request of Horace Lowry, president of the St. Paul (Minn.) City Railway, a hearing has been called for consideration of a cost-of-service franchise for that city by the Council. At the suggestion of one of the commissioners Sept. 9 was set for the first date. A tentative franchise has been submitted by the company, but no action has been taken.

North Shore Wages Adjusted.—Employees of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., have accepted the compromise increase in wages offered by the company. The settlement is said to have been at 67½ cents an hour on the basis of a ten and one-half hour day. The men formerly were receiving 45 and 50 cents an hour. The men had asked for an increase to 75 cents an hour.

Proposed New Line in Canton.—The municipality of Canton, China, is offering a franchise for the construction of an electric railway 10 miles long around the city, upon the site of the old city walls, which are being demolished. A copy of the terms upon which the franchise will be granted can be obtained from the Far Eastern Division, Bureau of Foreign and Domestic Commerce, Washington, D. C. (Refer to file No. 119,907.)

Civil Service Examinations Announced.—The New York State Civil Service Commission has announced the following examinations for Sept. 27, 1919: Bridge designer, office of Transit Commissioner, salary $1,500 to $2,100; five years of practical experience in drafting required. Junior engineer, Grade 7, salary, $1,200 to $1,500; two years of practical experience required. The positions are open to non-residents as well as residents of the State.

Border Strike Settled.—The strike on the Niagara, St. Catharines & Toronto Railway, St. Catharines, Ont., which tied up the Niagara district for three days, ended on Aug. 24 in a compromise. Strikers voted to return to work after a committee had reported that Superintendent Oliver had agreed to give them the information they asked regarding reasons for discharging Conductor William Bell, the union business agent.

Employee-Director in St. John.—In order that the employees may be kept more closely in touch with the company's affairs, and to promote a better mutual understanding, it has been decided to give the employees of the New Brunswick Power Company, St. John, N. B., the right to elect an employee as a member of the board of directors of the company, with all the authority and privileges enjoyed by other directors. This director is to be elected by a popular vote of all the employees.

Track Repairs Planned at Toledo.—The Toledo Railways & Light Company, Toledo, Ohio, has resumed work on track repairs, which was stopped when the City Council passed the ouster ordinance on June 30. The tracks on Superior Street between Jackson Street and Madison Avenue will be renewed. The management has announced that the company will proceed with permanent improvements on Adams Street, where new track will be laid. The work on Front Street is also to be completed.

Wants Decision Rendered — Louis Fridiger, counsel for the Amalgamated Association, appealed to Justice Robert F. Wagner of the Supreme Court on Sept. 2 for judgment on the pleadings against the Third Avenue Railway, New York, N. Y., in its suit to restrain the Amalgamated Association and thirty-four others from inducing or trying to induce employees of the railway and its subsidiary companies to join the union.

St. Louis Employees Heard. — The Public Service Commission of Missouri gave a rehearing on Aug. 26 to the United Railways, St. Louis, on the subject of increased wages to electricians in the employ of the company. These employees were included among other employees of the company in the arbitration of increased wages, and at present have the same standing in the award as other employees. The company called the attention of the commission to the fact that these employees are under contract to the company.

I. T. S. Labor Conference.—Representatives of the employees of the Illinois Traction System, Peoria, Ill., and officials of that system were scheduled to meet Sept. 2 in the office of Superintendent E. D. Bell in St. Louis to arrange for the transfer of the contract by which the company and the employees are now bound. At the time of the drawing of the contract the men were members of the Brotherhood of Interurban Trainmen, while they now belong to the Amalgamated Association. The question of wages was also to be taken up at the meeting.

Conference Between Officials.—With a view to preparing a franchise similar to the one held by the Cincinnati (Ohio) Traction Company, Hubert A. Mathonet and J. W. Whitemore of the Chamber of Commerce of Kansas City, Mo., conferred recently with W. C. Culkins, Street Railroad Director of Cincinnati. They expressed considerable satisfaction with the ordinance governing the operation of cars in Cincinnati and extended an invitation to Mr. Culkins to address the members of the Kansas City Chamber of Commerce on the subject at an early date.

Portland Men Dissatisfied.—The organized employees of the Portland Railway, Light & Power Company, Portland, Ore., have expressed by vote their disapproval of the award of 12½ per cent increase in wages made by the War Board. According to an agreement between the company and the employees decisions of the War Board will be ac-

cepted during the period of the war, or until the peace treaty is signed. The union is expected to adhere to this agreement and the company will not protest the decision of the War Labor Board.

Shore Line Strike Broken. — The Shore Line Electric Railway, Norwich, Conn., has resumed service on all its lines after a strike. One by one, division after division was started with new men. For the first time in nearly five weeks a car was operated between Norwich and Willimantic on Aug. 18. The men are being paid 37½ cents, 39 cents, and 42½ cents an hour, the latter rate being said to apply to former employees who returned to the service of the company.

Wants Public to Attend Wage Discussion.—Rankin Johnson, president of the Trenton & Mercer County Traction Corporation, Trenton, N. J., has requested the public to attend the conference to be held between the company and employees relative to a demand for a 25 per cent increase in pay. President Johnson says the wage question is one of general public interest and he wants the public to know what is being paid the men and what the company's income is at this time. The date of the hearing has not been set.

Proceedings to Oust Road from Highway.—Walter S. Ruff, prosecuting attorney of Starke County, on Aug. 12 brought *quo warranto* proceedings against the Northern Ohio Traction & Light Company in the Supreme Court of Ohio to compel the company to vacate the public road between Canton and Massillon. It is claimed the franchise has expired and that the company will not sign another one prepared by the County Commissioners, which contains a rate of fare objectionable to the management. The petition alleges that the entire road space is needed for vehicular traffic.

Mexican Interurban Talk.—A press dispatch from Mexico City, Mex., is to the effect that a contract has been entered into by the Department of Communication and Public Works of the Mexican government with the Mexico Tramways, Ltd., for the resumption of the construction of the interurban electric railway which will operate between the city of Mexico and Pueblo, about 130 miles. The construction of this line was begun some years ago, but before much progress had been made the revolutionary activities caused a suspension of work.

Wage Adjustment in Atlantic City.—Through an agreement signed between the employees of the Atlantic City & Shore Railroad, Atlantic City, N. J., and A. J. Purinton, general superintendent and receiver of the corporation, a wage increase approximating 10 cents an hour has been granted. This is a compromise, the men having asked for a raise approximating 24 cents an hour. The new agreement became effective at once and will run until March 1, 1921. The trouble over the shop rules and recognition of the union was also amicably settled.

Nashville Strike Settled.—The strike of the trainmen of the Nashville Railway & Light Company, Nashville, Tenn., has been settled. The men were out twenty hours. The agreement which resulted in the settlement was reached at a conference attended by the Mayor, a committee of the strikers and officers of the company. The company has agreed to recognize the union and to reinstate all former employees. The men have agreed not to present any new demands for a year. Both sides have agreed to arbitrate all differences in the future.

Wage Increase in Binghamton.—Conductors and motormen employed by the Binghamton (N. Y.) Railway are on a new salary schedule. An increase of 3 cents an hour, an average of 30 cents a day, $2.10 a week, providing they work seven days, was voluntarily granted by William G. Phelps, receiver for the company. No demand for higher pay had been made by the platform men. Conductors and motormen had been receiving an average wage of 31 to 35 cents an hour. Pay will now range from 34 to 38 cents an hour. Previous to the war the maximum rate was 24 cents an hour.

Service Being Gradually Resumed.—During the second week of the strike in Louisville, Ky., the Louisville Railway managed to keep ten lines in operation from 7 o'clock in the morning until 6 in the evening, service gradually improving until cars were running on four to ten-minute schedules. The company has refused to arbitrate with the union, agreeing to talk with individuals, and discuss matters with city officials and representatives of business men's organizations. A federal labor conciliator arrived in the city during the week, but discovered that there was nothing that he could do.

Mutual Insurance for Ottawa Employees.—A plan of mutual insurance is under consideration by the board of directors of the Ottawa (Ont.) Electric Railway and will be put in force in the near future. The company proposes to pay half the premium on a $1,000 policy taken out by any employee with the understanding that he shall receive $10 a week in case of sickness. If a man leaving the employ of the company desires to continue to carry his policy, he will be permitted to do so, and any man retiring on account of age will receive either a paid-up life insurance policy or a cash payment based on the amount of money paid by himself and the company.

So the People May Know.—In announcing a number of changes in routing for the betterment of the service, the Cincinnati (Ohio) Traction Company has published an explanation of the service-at-cost plan, under which it is now operating. It expresses the hope that the peak of increasing cost of operation has now been reached and that it will now be possible to make some of the improvements that are desired and needed. At the same time, care in the expenditure of money is necessary, since every dollar expended is reflected in the rate of fare. Some comparisons are made between the rate of fare in Cincinnati and fares in other places.

Wage Increase in Johnstown. — All motormen and conductors of the Johnstown (Pa.) Traction Company received a substantial increase in wages effective on Sept. 1. According to the new rates, motormen and conductors for the first three months will receive 45 cents an hour; next nine months, 47½ cents; after the first year, 50 cents. Under the former rates, an employee the first three months with the company received 40 cents an hour; from the third to the sixth month, 41 cents; from the sixth to the twelfth month, 42 cents; from the twelfth to the eighteenth month, 43 cents; from the eighteenth to the twenty-fourth month, 44 cents, and after twenty-five months, 45 cents an hour.

B. R. T. Employees Accept Increase.—The employees of the Brooklyn (N. Y.) Rapid Transit Company on Aug. 29 voted to accept the agreement of their representatives with the officers of the company providing for an increase in wages of 25 per cent and leave other questions to arbitration. Among matters still in dispute are the demand for a nine-hour day, instead of ten as at present, and the reduction of the term of employment before maximum wages are paid from ten years to five. An arbitration committee of three will take up these matters. Patrick J. Shea of the Amalgamated will represent the workers, and Lindley M. Garrison, receiver for the Brooklyn Rapid Transit System, the company. The third party, it was said, will be Lewis Nixon, Public Service Commissioner.

Short Strike in Peoria.—Cars are operating in Peoria, Ill., after a strike which for a time threatened to tie up the entire industrial life of the city, inasmuch as the strikers demanded that all workers in the city leave their employment and join the strike. Strikers at the time threatened violence to the cars and property of the Peoria Railway, but police interference prevented disorder. The trouble was caused by a strike among the miners. It spread to a number of other industries, including the railway. Motormen and conductors ran their cars into the carhouse and went quietly to their homes for fear that labor insurgents engaged in the general sympathetic strike would do damage to the rolling stock. The railway men were persuaded in a few hours to resume their duties.

Program of Meeting

Western Society of Engineers

A meeting of the Western Society of Engineers will be held Sept. 8 in Chicago. The subject will be "The Economic Future of Transportation Utilities." There will be several speakers.

Financial and Corporate

Municipal Railway Profit

Seattle Road Reported to Have Been Operated at Profit of $6,808 for First Three Months

Seattle's electric railway system netted a profit of $6,808 for the first three months of operation under municipal ownership, according to figures submitted by Thomas F. Murphine, superintendent. Revenues from all sources amounted to $1,299,039, a gain of $163,916 over the quarter ending March 31, 1919. Total known operating expenses are shown by the report to have been $1,052,727, to which Mr. Murphine adds an estimate of $40,722 for industrial insurance and damage claims, making a total of $1,093,449 as compared with $857,118 in the quarter ending March 31, 1919. In discussing the report Mr. Murphine said in part:

Extraordinary expenditures in the way of maintenance during the quarter more than offset the depreciation, as shown by the statement in the financial report that an average for depreciation would ordinarily be $75,000. Owing to the fact, however, that our maintenance charges are heavier by $98,743.93 than the same period last year we feel that we have appreciated the property and that no depreciation should be charged.

The total maintenance expenditure of $230,540 for this quarter is at the rate of $922,163 a year, or approximately 6 per cent of the value of the street railway properties. The various items for interest, industrial insurance and damage claims, deducted from the gain, would leave a net profit during the quarter of $6,808.

It will be noted from the statement that we operated during this quarter a total of 442,572 car-hours, which is 95,212 more car-hours than were operated during the corresponding quarter of the previous year by the combined lines of the Puget Sound Traction, Light & Power Company and the Municipal Railway divisions A and C.

It is also shown that we operated 760,499 more car-miles than in the corresponding quarter of the previous year by both railway systems.

The fact that the car-miles operated, which show an increase in excess of 22 per cent over the car-miles operated in the same quarter of the previous year, taken in conjunction with the fact that there has been a great increase in the use of the automobile as a method of transportation, indicate that the people are now getting an increased service in excess of the increased growth of the population of the city.

Mr. Murphine estimates that revenue derived from the operation of the municipal railway during the year 1920 will aggregate $7,017,000. Budget estimates submitted by Mr. Murphine to the Council call for a total expenditure of $7,002,250 during the year, making the net revenue for the year $14,750 on the basis of Mr. Murphine's figures. Revenue receipts as itemized by Mr. Murphine will be as follows:

Passenger fares, $6,225,000; freight, $60,000; sale of advertising contracts, $20,000; common user rights, $157,000; sale of power, $25,000; safety campaigns, $10,000; miscellaneous, $20,000; stores to construction, $500,000.

While the city will receive $25,000 from the sale of power, it will pay the Puget Sound Traction Company approximately $700,000 during the year for current. The $10,000 safety campaign allowance is expected to result from the inauguration of "safety first" measures which will reduce the budget estimate for medical aid and industrial insurance that amount. The $500,000 stores to construction item represents supplies to be bought during the year out of maintenance funds that will be used in construction work and will be chargeable to the bond construction fund.

Ohio Abandonment Sanctioned

On Aug. 28 the Ohio Public Utilities Commission ruled that the Cincinnati & Columbus Traction line between Owensville and Hillsboro could be dismantled and junked, but that the section between Owensville and Norwood must be kept in operation. The consumers of current along the abandoned portion will be supplied until some other arrangement can be made for them. The evidence showed that the auto truck and automobile have been big factors in damaging the line.

The order was made on the application of the Union Savings Bank & Trust Company, Cincinnati, trustee for the first mortgage note holders, to abandon the entire line. The petition was filed under the Gilmore act of 1917.

Operation of the road was begun in 1903. Common and preferred stock to the amount of $2,500,000 each was issued, together with $600,000 of first and $86,000 of second mortgage bonds.

The destruction of the Little Miami River bridge by a flood in 1913 threw the company into the hands of a receiver. In 1918 the losses had become such that the courts ordered the property sold, and the Union Savings Bank & Trust Company bid it in at $200,000 as trustee for the first mortgage bondholders.

During the receivership the net earnings varied from $6,253 to $32,430, but they were never sufficient to pay the fixed charges. The commission found that the enormous increase in operating expenses had played a big part in bringing the property to its present condition. In 1913 it was found that operating expenses and taxes were $88,467, while in 1918 they had increased to $172,130 or almost 100 per cent.

The commission expressed the belief that the present owners should endeavor to operate the portion of the road that is paying best until the loop in Cincinnati is completed, when interurban cars will be able to reach the business portion of the city. After that, it was stated, there can be little question of the future prosperity of the line.

Receiver for Berkshire

Company, Beset by Labor and Fare Troubles, May Resume Service in Part

A partial resumption of service on the Berkshire Street Railway in Pittsfield and North Adams, Mass., is hoped for early realization following the appointment of Clinton Q. Richmond, general manager, as receiver of the company. The road has been tied up for about four weeks by a deadlock regarding revenue and wages.

In Massachusetts the company operates about 114 miles of track and is the chief source of electric transportation from north to south, and vice versa in western Massachusetts.

A revised schedule of fares has been proposed by Mr. Richmond, in which the 5-cent fare is to be retained within a 2-mile radius in the cities of Pittsfield and North Adams, with an outside zone rate of 2.5 cents per mile.

Mr. Richmond has offered to increase the wages of car-service men 12 per cent provided the Massachusetts Public Service Commission grants the new rate schedule. The men demand a 33 per cent increase, claiming that their rates of pay should be on the same basis as the Springfield Street Railway. The company's officials maintain that a 12 per cent wage increase would place the men on the same basis as the employees of the Connecticut Company and of the local systems at Albany and Troy, N. Y.

PETITION FOR RECEIVER FILED AUG. 22

Three petitions for a receiver were filed on Aug. 22. The applicants were the New York, New Haven & Hartford Railroad, and W. F. Gilbert & Company, New Haven, Conn. The New Haven Railroad is the owner of the stock of the Berkshire Company ($5,398,100) and of debenture bonds of $200,000 issued in 1905, the interest on which has been defaulted since March 1, 1918. Gilbert & Company are coal dealers and creditors of the Berkshire Company to the extent of $48,000. The company is also indebted to the New Haven road on notes for $3,357,500, and in further sums for which no notes have been issued for cash advanced to finance construction and to meet interest and other expenses.

Many industries are dependent upon the company's service and there is a strong disposition in the district to bring about a more satisfactory schedule of rates which will at least enable the more essential lines to resume operation. The refusal of the employees to return to their posts, even upon the basis of the 12 per cent increase suggested, is proving a stumbling block in the restoration of local service, but it is expected that in the city districts covered it will be possible to start operations soon if the new rate schedule is sanctioned. The company will probably employ safety cars to a considerable extent on these lines.

$42,790,000 Required

This Is Cash Requirement of I. R. T. for Five Years, in Addition to Earnings

The committee representing the holders of the 4½ per cent collateral trust gold bonds of the Interborough-Metropolitan Company, New York, N. Y., has received from Stone & Webster a report on the affairs of the Interborough Rapid Transit Company supplementary to one made previously.

In the circular of Aug. 13, to which reference was made in the ELECTRIC RAILWAY JOURNAL, for the committee representing the security holders it was pointed out that the estimate of Stone & Webster as to the probable deficits of the Interborough Rapid Transit Company for 1920 to 1924 inclusive was "based upon the scale of wages now prevailing in New York City and the present prices for materials and supplies."

Since that circular was issued the company has granted a 25 per cent increase in wages to a large proportion of its employees and has agreed to submit to arbitration various questions of difference between the company and its employees affecting wages, hours and conditions of work, etc.

Stone & Webster now advise that the 25 per cent increase in wages, if continued, supposing other conditions to continue as at present, will result in increasing their estimates of probable deficits, and that the estimates are in substantial accord with the figures of the officers of the company.

A table submitted by the engineers shows that although under the old wage scale the deficit would decrease progressively yearly, and thus in 1924 a surplus of $864,000 would be shown, the 25 per cent increase in wages would result in the following annual deficit: 1920, $8,778,000; 1921, $8,678,000; 1922, $7,155,000; 1923, $5,993,000; 1924, $4,786,000.

Stone & Webster estimate, therefore, that the company will require before July 1, 1924, under the new wage scale in force, in addition to about $7,400,000 needed for capital purposes, $35,390,000 for deficits, making cash requirement for that period in addition to earnings $42,790,000.

The engineers point out that although present wages, cost of materials and supplies and other operating expenditures continue, and the 5-cent fare is in force, the company will not be able to earn its fixed charges for many years after 1924. They state also that the increased wage scale just granted to the employees of the New York Railways will make it impossible for the surface lines to earn their operating expenses and taxes unless there is a substantial increase in gross earnings.

The investigation carried on by Stone & Webster, in co-operation with Price, Waterhouse & Company, certified public accountants, covered the city-owned subways operated by the Interborough and the elevated lines operated by that company under its own franchise and its lease from the Manhattan Railway.

The preliminary report, dated Aug. 11 and made public on Aug. 13, showed that a deficit would exist under the old wage scale up to 1924, when for the first time a slight surplus would be shown. The report on which the present letter is based takes into consideration the 25 per cent increase granted after the recent strike.

Sells Direct to Investor

$3,600,000 of Five-Year 7 Per Cent Notes Have Been Sold to Home Investors at Milwaukee

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., is another public utility that has demonstrated that it is possible to dispose of a considerable issue of public utility securities through a direct offering by the company itself to local investors. Up to July 24 nearly $3,500,000 of an issue of $3,600,000 of five-year 7 per cent bond-secured notes had been bought in small lots by 4750 investors, mostly Milwaukee men and women.

The sale started on Dec. 18 last and is still in progress, less than $100,000 of the issue remaining to be sold. The company felt from the beginning that it could sell the notes at less cost through advertising in the local papers than through the usual bankers' syndicate. This has proved true.

The advantages of such a sale from the standpoint of the company through the ties that it makes among local people of material advantage to the company are too readily apparent to need reiteration. The saving in marketing the issue will work indirectly, of course, to the benefit of the company's customers, for they are concerned in all the savings and economies effected by the company. It might be remarked, however, that the new investors have brought the company a good many new customers.

Another phase of the matter is that the campaign of advertising conducted in connection with the placing of the securities has introduced the company to the habit of advertising regularly and fairly liberally, with a resulting good effect upon the mental attitude of all home papers toward the business. Most of the advertisements about the note sale have been coupled up in the same column with advertisements of the company's electric railway service, its electrical appliance business, its interurban express service, and its public relations generally, with notably good results in all of these fields. In short, the advertising has not only sold the notes at home, but is believed to have gone far to "sell" the company into the good-will of the public at the same time.

The price of the notes is par for cash. In the case of those who invest in the notes and need their money before the maturity date, the company has agreed to create a market by putting the notes on sale any time after the sale of the original issue closes.

Sept. 1 Dividend Postponed

Indianapolis Company Decides on This Course After Conference With Public Service Commission

After discussing the matter with the Public Service Commission of Indiana, the directors of the Indianapolis Street Railway have decided to postpone temporarily the Sept. 1 installment of dividend on the Indianapolis Street Railway stock. In a letter to the stockholders, dated Aug. 30, Robert I. Todd, president of the company, calls attention to bond interest charges due since April 1 and July 1, 1919, which have to be met; also to an additional annual cost of operation estimated at $125,000 resulting from the recent wage increases granted to the employees of the company. It is stated in the letter to the stockholders that a petition will be presented to the commission within a few days for permission to charge 1 cent for transfers on the city lines.

Following the conference with the directors, the Public Service Commission addressed a commendatory letter to the railway stating that it was not the function of the commission to direct the payment or non-payment of dividends. This letter follows in part:

The commission is informed that the company has made rapid and satisfactory progress in the matter of extensions and service. The company has shown a disposition to meet all the requirements of the commission, and the general attitude of the company with respect to all matters which have been before the commission is to be commended.

In the matter of the capitalization of the consolidated company the officers and directors have shown a spirit of compliance. The commission is informed that the consents of bondholders to the temporary discontinuance of direct payments into the bond-sinking funds and the discontinuance of payments of interest on bonds in the sinking funds are now being secured. The commission's order required that these consents be secured by Sept. 1. Our information is to the effect that it will be impossible to secure the necessary consents by Sept. 1 and that perhaps thirty days additional time will be necessary apparently laying a sound financial basis for future operation.

The commission is of the opinion that no dividends should be paid on Sept. 1 for the reason that while the company has made satisfactory progress in fulfillment of its franchise obligations there is still considerable work to be done.

In view of this fact, the commission is not in a position to hold that there has yet been a substantial compliance with the franchise requirements or the orders of the commission, although the company will undoubtedly within a short time be able fully to comply with all such requirements.

This attitude of the commission should not be interpreted by the stockholders of the company as indicating a disposition on the part of the commission to permit no dividends to be paid; on the other hand, the commission is of the opinion that the payment of dividends should be resumed at the earliest date consistent with the company's welfare and its franchise obligations. The commission is fully of the opinion that a return on investment is absolutely essential to the establishment of credit which will make it possible for the company to render proper service. We are advised that within the next two or three months the company will have complied with all of the requirements in question. The commission, therefore, can see no reason why the payment of dividends cannot be resumed when such requirements have been met.

Among other things, the purpose of this letter is to dispel any thought that the commission is opposed to the payment of dividends or that the commission believes that the payment of dividends should be postponed for a long period of time. This information is given to the company and its stockholders in order that they may not be misinformed about the commission's attitude.

Fare Returns for May Give Promise

Reflect a Belated Readjustment of the Industry to Unfavorable Conditions Rather Than to Any Improvement in Conditions Themselves

There is a promise of better conditions for the future in the operating returns of electric railways for the month of May as made by companies reporting to the Information Bureau of the American Electric Railway Association. Compared with May, 1918, a slight improvement is shown, which if it continues, should eventually lead the industry back to a self-sustaining basis.

Returns Analyzed

The returns for May offer the first opportunity in a long time for making a fair comparison with the corresponding month of the preceding year; that is, it is the first month that has occurred in a long time in which generally normal conditions prevailed in two successive years. In May, 1916, the heavy storms which crippled operation in the East, South, and Middle West during the winter and spring were well over and the roads had about gotten back to normal operation. And there was no influenza epidemic at the time in either year such as defeated all attempts to make comparisons during the months of October, November and December, 1918. It is fair to assume, therefore, that the figures in the accompanying tables reflect general conditions as they affect electric railways.

A short study of the accompanying tables leaves the impression that the slight improvement noted above is due to a belated readjustment of the industry to unfavorable conditions rather than to any improvement in conditions themselves. The improvement shows principally in the net income per car-mile which for the country generally increased 0.35 per cent. That this improvement is not due to favorable operating conditions is shown by the relative increases in operating revenues and operating expenses. The revenues per car-mile increased 22.87 per cent while the expenses went up 33.59 per cent, producing a decrease in the net revenue of 0.39 per cent. This is the smallest decrease in net revenue that has been returned in many months, and that it is not larger can be attributed to the numerous fare increases which are beginning to produce the increased revenue that was expected of them.

Taxes increased 9.42 per cent and deductions from income 8.95 per cent. The situation was saved, however, by the increase in non-operating income and the development of revenue from auxiliary operations which was not available in 1918, all of which confirms the impression that the slight improvement noticed is due to a belated readjustment to abnormal conditions. The companies are securing new fare increases and they are realizing on past increases. And in addition they are developing sources of revenue outside of strictly railway operations.

Another source of increased revenue should not be overlooked, and that is the demobilization of the army. Several million men have been returned to private life from abroad and from the training camps, and it is safe to assume that a large proportion of these are now daily riders. In addition, as somebody has pointed out, this class of men are responsible for a great deal of the pleasure riding.

In Tables III and IV on page 499 details of the operating expenses are given; Table III showing the amounts in dollars and Table IV showing the amounts in cents per car-mile.

Heavy increases in the cost of materials are implied in the two maintenance accounts, way and structures and equipment. In the former the cost per car-mile jumped from 2.66 cents to 4.64 cents, an increase of 74.44 per cent. This is for the country as a whole. The greatest increase is in the East where the cost of maintenance of way and structures rose from 3.38 cents per car-mile to 6.61 cents, an increase of 95.56 per cent. In the South and West increases in this account were more moderate, being 20.95 per cent and 27.78 per cent respectively.

Operating Expenses Show Increase

The cost of operating the cars, that is principally the wages of trainmen, increased for the country as a whole from 9.94 cents to 12.97 cents per car-mile, or 30.48 per cent. The heaviest increase in this account was also in the East where the actual cost per car-mile is already greatest, being 10.18 cents per car-mile in 1918 and 13.81 cents per car-mile in 1919, an increase of 35.66 per cent. In the South and West the increase was practically uniform, being 23.79 per cent in the South and 23.89 per cent in the West.

The cost of power for the country as a whole was 3.32 cents per car-mile in 1918, and 3.93 cents in 1919, an increase of 18.37 per cent. The greatest increase in the cost of power was in the South where it amounted to 97.87 per cent, rising from 0.94 cent per car-mile to 1.86 cents per car-mile. However, a number of companies in the South include the cost of power under conducting transportation which accounts for the smallness of the amount and also in part for the large ratio of increase.

As in the past, the returns from both city and interurban companies have been classified according to the following geographic grouping: Eastern District—east of the Mississippi River and north of the Ohio River; Southern District—south of the Ohio River and east of the Mississippi River; Western District—west of the Mississippi River. The figures in italics in the tables indicate a decrease.

A Profit Replaces a Loss

The city authorities of Ocean City, N. J., are meeting with success in the operation of the Ocean City Electric Railway following the refusal of the company to operate because of the expenses being too great. William E. Massey, trustee of the railway, who was appointed to the position by Chancellor Edwin Robert Walker, reports that since the line has been in operation this summer the increase in net travel with a 7-cent fare has been 34 per cent. The same number of cars is in operation as was used during 1918. The road was operated during the summer of 1918 and the board of directors suspended operation on Nov. 1.

Residents of the city, especially those who spent the summer months there, demanded that the road be placed in operation again and Mayor Champion and others had a bill passed by the Legislature, allowing the city to operate the line. The municipality advanced a small amount of money so the road could begin operations this summer, and this amount has already been paid back. The road is more than meeting its operating expenses and from present indications there will be a balance in the treasury by Oct. 1, the date to which the order permits operation under the trustee.

TABLE I—INCOME STATEMENT OF FORTY-FOUR ELECTRIC RAILWAYS FOR MAY, 1919, COMPARED WITH MAY, 1918

	United States		East		South		West	
	1919	1918	1919	1918	1919	1918	1919	1918
Railway operating revenue	$9,915,162	$7,976,269	$6,303,234	$4,867,624	$1,190,642	$1,053,590	$2,421,286	$2,055,055
Railway operating expenses	7,375,150	5,456,419	4,916,532	3,480,975	781,454	629,480	1,677,164	1,345,964
Net operating revenue	2,540,012	2,519,850	1,386,702	1,386,649	409,188	424,110	744,122	709,091
Net revenue: Auxiliary operations	79,260	.....	70,441	.....	1,012	.....	7,807	.....
Taxes	513,643	462,133	295,431	252,907	94,601	95,173	123,611	114,053
Operating income	2,105,629	2,057,717	1,161,712	1,133,742	315,599	328,937	628,318	595,038
Non-operating income	558,962	414,008	242,897	222,389	171,437	144,027	144,628	47,592
Gross income	2,664,591	2,471,725	1,404,609	1,356,131	487,036	472,964	772,946	642,630
Deductions from gross income	1,967,340	1,784,133	1,143,893	1,010,702	281,062	264,684	542,385	508,747
Net income	697,251	687,592	260,716	345,429	205,974	208,280	230,561	133,883
Operating ratio (per cent)	74.38	68.41	78.00	71.51	65.63	59.75	69.27	65.50
Car-miles operated	24,500,401	24,223,264	14,010,100	13,803,099	3,504,239	3,484,715	6,986,062	6,935,450

TABLE II—INCOME STATEMENT IN CENTS PER CAR-MILE OF FORTY-FOUR COMPANIES APPEARING IN TABLE I, FOR MAY, 1919, COMPARED WITH MAY, 1918

	United States			East			South			West		
	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase
Railway operating revenue	40.46	32.93	22.87	44.99	35.26	27.59	33.98	30.23	12.40	34.66	29.63	16.98
Railway operating expenses	30.10	22.53	33.59	35.09	25.22	39.13	22.30	18.06	23.48	24.01	19.41	23.69
Net operating revenue	10.36	10.40	*0.39*	9.90	10.04	*1.40*	11.68	12.17	*4.03*	10.65	10.22	4.21
Net revenue: Auxiliary operations	0.32	.....	.....	0.50	.....	.....	0.03	.....	.....	0.11	.....	.....
Taxes	2.09	1.91	9.42	2.11	1.83	15.30	2.70	2.73	1.10	1.77	1.64	7.93
Operating income	8.59	8.49	1.18	8.29	8.21	0.97	9.01	9.44	*4.56*	8.99	8.58	4.78
Non-operating income	2.28	1.71	33.33	1.73	1.61	7.45	4.89	4.13	18.40	2.07	0.69	200.00
Gross income	10.87	10.20	6.57	10.02	9.82	2.03	13.90	13.57	2.43	11.06	9.27	19.31
Deductions from gross income	8.03	7.37	8.95	8.16	7.32	11.47	8.02	7.59	5.66	7.76	7.34	5.72
Net income	2.84	2.83	0.35	1.86	2.50	*25.60*	5.88	5.98	*1.67*	3.30	1.93	70.98
Operating ratio (per cent)	74.38	68.41	8.73	78.00	71.51	9.08	65.63	59.75	9.84	69.27	65.50	5.75
Car-miles operated	24,500,401	24,223,264	1.14	14,010,100	13,803,099	1.50	3,504,239	3,484,715	0.56	6,986,062	6,935,450	0.73

TABLE III—OPERATING EXPENSES OF *SIXTY ELECTRIC RAILWAYS FOR MAY, 1919, COMPARED WITH MAY, 1918

	United States		East		South		West	
	1919	1918	1919	1918	1919	1918	1919	1918
Operating expenses	[1]$8,405,046	[4]$6,290,277	[2]$5,443,493	[3]$3,906,378	$1,065,650	$845,665	$1,895,903	$1,538,234
Way and structures	1,324,283	751,761	1,036,250	522,505	122,858	101,028	165,175	128,228
Equipment	996,373	780,511	642,551	525,013	125,906	83,059	227,916	172,511
Power	1,120,761	935,723	734,194	665,444	90,162	45,075	296,405	225,204
Conducting transportation	3,696,717	2,803,592	2,165,869	1,574,120	595,050	477,255	935,798	752,217
Traffic	29,833	35,063	16,960	22,516	3,194	3,783	9,679	8,764
General and miscellaneous	1,036,445	921,922	640,669	534,907	128,480	135,465	267,296	251,550
Transportation for investment — Cr.	.....	*367*	.....	*127*	.....	.....	*6,366*	*240*
Car-miles operated	28,510,907	28,216,829	15,679,622	15,460,800	4,844,433	4,806,341	7,986,852	7,949,688

* NOTE—This table includes the expenses of the forty-four companies shown in Tables I and II and in addition sixteen other companies which are not included in Tables I and II, because of the fact that they do a power and light business and do not separate their railway taxes and fixed charges from the taxes and fixed charges of their other business.

[1] Includes $207,000 undistributed depreciation.
[2] Includes $207,000 undistributed depreciation.
[3] Includes $62,000 undistributed depreciation.
[4] Includes $62,000 undistributed depreciation.

TABLE IV—OPERATING EXPENSES IN CENTS PER CAR-MILE OF SIXTY COMPANIES APPEARING IN TABLE III, FOR MAY, 1919, COMPARED WITH MAY, 1918

	United States			East			South			West		
	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase
Operating expenses	[1]29.48	[4]22.29	32.26	[2]34.72	[3]25.27	37.40	21.99	17.59	25.00	23.74	19.35	22.69
Way and structures	4.64	2.66	74.44	6.61	3.38	95.56	2.54	2.10	20.95	2.07	1.62	27.78
Equipment	3.49	2.77	25.99	4.10	3.40	20.59	2.60	1.73	50.29	2.85	2.17	31.34
Power	3.93	3.32	18.37	4.68	4.30	8.84	1.86	0.94	97.87	3.71	2.83	31.09
Conducting transportation	12.97	9.94	30.48	13.81	10.18	35.66	12.28	9.92	23.79	11.72	9.46	23.89
Traffic	0.10	0.12	*16.67*	0.11	0.15	*26.67*	0.06	0.08	*25.00*	0.12	0.11	9.09
General and miscellaneous	3.64	3.27	11.31	4.08	3.46	17.92	2.65	2.82	*6.03*	3.35	3.16	6.01
Transp. for investment — Cr.	.....	.....	.....	.....	.....	.....	.....	.....	.....	*0.08*	.....	.....
Car-miles operated	28,510,907	28,216,829	1.04	15,679,622	15,460,800	1.41	4,844,433	4,806,341	0.79	7,986,852	7,949,688	0.47

[1] Includes 0.71 cent per car-mile for undistributed depreciation.
[2] Includes 1.33 cents per car-mile for undistributed depreciation.
[3] Includes 0.40 cent per car mile for undistributed depreciation.
[4] Includes 0.21 cent per car mile for undistributed depreciation.

TABLE V—INCOME STATEMENT OF *124 RAILWAYS FOR MAY, 1919

	United States	East	South	West
Railway operating revenue	$24,351,664	$17,765,877	$1,500,461	$5,085,326
Railway operating expenses	17,685,039	13,085,552	996,539	3,602,948
Net operating revenue	6,666,625	4,680,325	503,922	1,482,378
Net revenue: Auxiliary operations	642,271	358,953	82,467	200,851
Taxes	1,358,926	951,445	126,757	280,724
Operating income	5,949,970	4,087,833	459,632	1,402,505
Non-operating income	708,545	368,895	175,399	164,251
Gross income	6,658,515	4,456,728	635,031	1,566,756
Deductions from gross income	4,960,540	3,374,242	369,906	1,216,392
Net income	1,697,975	1,082,486	265,125	350,364
Operating ratio	72.62	73.65	66.42	70.85
Car-miles operated	62,201,377	43,713,616	4,387,876	14,099,885

* Includes the companies shown in Tables I to IV and others for which the 1918 figures are not available.

TABLE VI—INCOME STATEMENT OF TABLE V, IN CENTS PER CAR-MILE

	United States	East	South	West
Railway operating revenue	39.20	40.63	34.20	36.07
Railway operating expenses	28.50	29.93	22.71	25.55
Net operating revenue	10.70	10.70	11.49	10.52
New revenue: Auxiliary operations	1.03	0.82	1.88	1.42
Taxes	2.19	2.17	2.89	2.00
Operating income	9.54	9.35	10.47	9.95
Non-operating income	1.14	0.85	4.00	1.16
Gross income	10.68	10.20	14.47	11.11
Deductions from gross income	7.98	7.72	8.43	8.63
Net income	2.70	2.48	6.04	2.48
Operating ratio	72.62	73.65	66.42	70.85
Car-miles operated	62,201,377	43,713,616	4,387,876	14,099,885

TABLE VII—DETAILED STATEMENT OF OPERATING EXPENSES OF *150 RAILWAYS FOR MAY, 1919

	United States	East	South	West
Operating expenses	[1]$19,730,914	[2]$13,658,135	$1,288,338	$4,784,441
Way and structures	2,743,462	2,039,808	150,388	553,266
Equipment	2,455,905	1,660,179	152,833	642,893
Power	2,882,600	2,027,200	118,423	736,977
Conducting transportation	8,756,013	5,912,218	[3]698,128	2,145,667
Traffic	93,794	51,112	5,279	37,403
General and miscellaneous	2,542,488	1,701,081	163,287	678,120
Transportation for investment — Cr.	*10,407*	*522*	.....	*9,885*
Car-miles operated	71,104,119	46,129,165	5,768,673	19,206,281

* NOTE—This table includes the expenses of the 124 companies shown in Tables V and VI and in addition twenty-six other companies which are not included in Tables V and VI because of the fact that they do a power and light business and do not separate their railway taxes and fixed charges from the taxes and fixed charges of their other business.

[1] Includes $267,059 undistributed depreciation and freight department expenses.
[2] Includes $267,059 undistributed depreciation and freight department expenses.
[3] Includes some power.

TABLE VIII—DETAILED STATEMENT OF THE OPERATING EXPENSES OF THE 150 COMPANIES APPEARING IN TABLE VII, SHOWING THE AMOUNTS IN CENTS PER CAR-MILE

	United States	East	South	West
Operating expenses	[1]$27.75	[2]$29.61	$22.33	$24.91
Way and structures	3.86	4.42	2.61	2.88
Equipment	3.45	3.60	2.65	3.35
Power	4.05	4.39	2.05	3.84
Conducting transportation	12.31	12.82	[3]12.10	11.17
Traffic	0.13	0.11	0.09	0.19
General and miscellaneous	3.58	3.69	2.83	3.53
Transportation for investment — Cr.	*0.01*	.....	.....	*0.05*
Car-miles operated	71,104,119	46,129,165	5,768,673	19,206,281

[1] Includes 0.38 cent per car-mile for undistributed depreciation and freight department expenses.
[2] Includes 0.58 cent per car-mile for undistributed depreciation and freight department expenses.
[3] Includes some power.

Indianapolis Merger Legal

Court Upholds Proceedings in Connection With Consolidation of Street Railway and Terminal Company

Judge Ferdinand A. Geiger, serving as special judge in the Federal Court for the district of Indiana, on Aug. 29 handed down a decision approving the legality of the recent merger of the Indianapolis Traction & Terminal Company and the leased lines of the Indianapolis Street Railway. He also sustained the motion of the defendants in the suit brought by certain minority stockholders for an injunction against the new consolidated Indianapolis Street Railway and affiliated properties.

The complainants in their bill contended that conditions which were required by the Public Service Commission of Indiana when it approved the merger agreement on June 28, as reported in the issue of the ELECTRIC RAILWAY JOURNAL for July 5, page 42, made fundamental changes in the merger contract and consequently were of such character that the directors of the two companies were without authority to accept what amounted to a new contract. It was also contended that the proceedings at the meeting of the stockholders of the Indianapolis Street Railway were without lawful effect, and that the Indianapolis Traction & Terminal Company had violated certain conditions of its lease of the street railway property.

1899 LAW SUFFICIENT

Judge Geiger decided that the law passed by the Indiana Legislature of 1899 authorizes domestic street railways to consolidate, and is not restricted to consolidations in which a company operating to the State line and there connecting with a line of another state is a party. He referred to the decision of the Indiana Supreme Court in the case of Norton *vs.* Union Traction Company of Indiana, wherein a merger was upheld, and gave great weight to that decision.

The judge found that the Norton case forecloses the contention of the complainant in the present suit that a unanimous vote of the stockholders, or a greater preponderance than was shown at the stockholders' meeting of the Indianapolis Street Railway is necessary to authorize a consolidation. In the Norton case it was decided that a vote of the holders of a majority of the stock was sufficient.

The court found that there was an unusually large attendance of stockholders, either in person or represented by proxy, at the meeting of the Indianapolis Street Railway when the merger was approved, and Judge Geiger's view was that the stockholders considered the wisdom of the consolidation and reached a conclusion, and as there were no facts presented "to enable the court to point out when or wherein the power of the majority stockholders to further or adopt the merger plan either broke down or was oppressive or unconscionably exercised," a court would be slow to upset the judgment of the stockholders as represented by the present merger.

Financial News Notes

Sale Under Foreclosure Postponed.—United States Judge Frank H. Rudkin at Spokane, Wash., has entered an order postponing the sale of the Spokane & Inland Empire Railroad under foreclosure, from Oct. 1 to Nov. 1.

Receiver for Alabama Company.—The North Alabama Traction Company, Albany, Ala., operating in Albany and Decatur, has been adjudged bankrupt on petition of New York bondholders. A. A. Hardage has been made receiver.

Would Abandon Short Line. — The Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has applied to the Public Utilities Commission of Pennsylvania for authority to abandon operation of its electric lines between Knowles and Mineral Ridge, about 2½ miles.

Funds for Memphis Interest Payment. — The receivers of Memphis (Tenn.) Street Railway on Sept. 2 deposited with Central Union Trust Company, New York, N. Y., funds for the payment of the July 1, 1919, interest on the consolidated 5 per cent mortgage bonds of that company together with two months interest thereon at 5 per cent.

Aid for Kansas City Railways.—A special dispatch from Kansas City, Mo., says that a loan of $1,000,000 by Armour interests saved the Kansas City (Mo.) Railways from receivership on Sept. 1, the time limit for the payment of interest defaulted on July 1. The recent increase of fares to 8 cents is expected to provide enough revenue to meet the interest charges in future.

Mr. Garrison Made Permanent Receiver.—Judge Julius M. Mayer in the Federal District Court has made permanent the appointment of Receiver Lindley M. Garrison of the Brooklyn Rapid Transit Company as receiver of the surface lines in Brooklyn. At the same time the court also ordered the consolidation of the foreclosure and general creditors' suits against the Brooklyn Rapid Transit Company and subsidiaries.

Receiver for Small Pennsylvania Company.—The Title Trust & Guarantee Company, Johnstown, Pa., has been made receiver for the Penn Central Railway, Johnstown, formerly the South Fork & Portage Company, with a hearing to be held soon on the question whether the order shall be made permanent. The capital stock of the railway is $250,000. There was a reorganization about a year ago. O. P. Thomas then became head of the concern.

Colorado Springs Bondholders Act.—The Colorado Springs & Cripple Creek District Railway, Colorado Springs, Col., defaulted on the interest due on Jan. 1, 1919, on the first mortgage 5 per cent bonds dated Jan. 1, 1900. The company also defaulted on the July 1, 1919, interest, and the sinking fund installments due Jan. 1 and July 1, 1919. In consequence the Central Union Trust Company, New York, N. Y., trustee, at the request of $1,183,000 out of a total of $1,225,000 of the bonds, has declared the principal of all the bonds issued and outstanding to be immediately due and payable in accordance with the terms of the indenture under which the bonds are secured. George M. Taylor has been appointed receiver.

Seeks to Capitalize Expenditures.—The Georgia Railway & Power Company and the Georgia Railway & Electric Company, Atlanta, Ga., have petitioned the Georgia Railroad Commission for permission to issue more than $500,000 of bonds. According to the petition $489,000 is wanted by the power company to reimburse it for expenditures made since April 1, 1914, for construction work, such as power houses, dams, buildings needed for the hydroelectric plant in the process of development, and for other property acquired. The $105,000 asked for by the electric company is, the petition states, 75 per cent of expenditures for additions and extension to the plant made since Jan. 1 of this year.

Interurban Offers Notes. — Halsey, Stuart & Company and the National City Company, New York, N. Y., are offering for subscription $1,100,000 of 6 per cent gold notes of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., divided as follows: $600,000 series A, due on Aug. 1, 1920, offered at 99.29 and interest, yielding 6.75 per cent, and $500,000 of 6 per cent equipment gold notes, due $50,000 on Aug. 1, 1920, and $25,000 each year in February and August thereafter to Aug. 1, 1929, at subscription prices varying according to maturity to yield between 6.50 per cent and 6.75 per cent. The series A notes are secured by deposit with the trustees of $857,200 par value of the company's first mortgage 5 per cent gold bonds, which are pledged at approximately 70 per cent. The equipment gold notes are secured by a first lien on fifteen steel interurban motor cars, fifteen steel interurban control trailer passenger cars, twelve parcel dispatch motor cars and ten one-man safety cars. The total cost of the equipment is at the rate of $100 of equipment for each $70 of notes issued. The statement of earnings for the year ended June 30, 1919, shows a net income available for interest charges, depreciation, etc., of $906,872. The annual interest charge on the securities now offered is $316,450.

Traffic and Transportation

Zones and Higher Fares

Commissioner Nixon Raises Rates on New York & North Shore Road—Shutdown Had Been Threatened

Public Service Commissioner Lewis Nixon, of the First District of New York, on Aug. 28 took action to preserve the operation of the New York & North Shore Traction Company, Roslyn, N. Y., to the traveling public, by issuing an order, on the recommendation of Deputy Commissioner Alfred M. Barrett, permitting the road to establish a zone system of fares from Flushing to Whitestone, and from Flushing to Little Neck in excess of the existing 5-cent fare. Evidence had been presented to the commission that the company's cars might stop running on Aug. 29 if the officials of the road were not assured of some means of additional revenue.

Had Threatened Shutdown

The stockholders of the company recently announced that they could no longer stand the losses entailed by operation of the road at a 5-cent fare. The new fare system which has been worked out provides for four zones, the initial fare in each of which is 6 cents. The fare from Flushing to Little Neck will be 10 cents. The fare in any single zone will be 6 cents, save in zone 4, where it will be 7 cents. For a passenger making a continuous trip from zone 1 to and into zone 3, 2 cents will be added to the original 6-cent fare in each zone to bring the total up to 10 cents.

Commissioner Nixon's act in raising the fare is the first occasion on which the Public Service Commission of the First District has increased a rate of fare. It is contended that the commission has the power to raise as well as to lower fares under the recent Court of Appeals decision in the Buffalo case. The courts will probably be called upon to settle the North Shore rate question as a test case.

City Fights Increases

Acting under directions from the Mayor, Corporation Counsel William P. Burr, on Sept. 2, served notice on George A. Stanley, president of the railway, forbidding him to put the higher fares into effect. At the same time the Corporation Counsel's office requested a rehearing of the case. Commissioner Nixon has said that the authorization was an emergency measure, and that if the city requested a rehearing the case would be reopened.

The commissioner set the rehearing for Friday evening, Sept. 5, in the Flushing Town Hall. He announced that he would be glad to answer the questions of Mayor Hylan and other city officials who cared to attend.

Mayor Hylan had already sent a letter to Public Service Commissioner Nixon declaring that his action in allowing the establishment of the zone system and the increase in fares was illegal, and contrary to the decision of the Court of Appeals. The Mayor demanded that the commissioner rescind his action. During the hearing on the company's petition, at which were representatives of the city of New York and of the communities interested in the case, no one entered an objection to the fare increase.

The Mayor on Sept. 3 instructed the Corporation Counsel to take steps to secure from the courts a writ of prohibition restraining the company from collecting the righer rates.

The Mayor has since issued an appeal to the people of New York calling for the formation of a Citizens' Vigilance Committee of 1000 to oppose any attempt to increase fares on the part of the New York rapid transit lines. The Mayor's plea calls for a canvass of all candidates for the State Legislature to ascertain their views on the fare question. At the organization meeting of the vigilance committee the Mayor was chosen honorary chairman.

Service at Cost May Be Tried in Denver

Pursuant to the agreement of the city of Denver, Col., allowing a 6-cent fare to be charged by the Denver Tramway until an election is held to decide upon a permanent plan, two plans are to be submitted at the election to be held early in November.

1. The "elastic" 6-cent fare sponsored by the company would continue the present 6-cent fare until the average wage in five other cities, viz.: St. Louis, Kansas City, St. Paul, Omaha, and Milwaukee, had fallen below the present wage of 48 cents an hour for trainmen.

2. The service-at-cost plan, urged by the citizens' committee of fifty-five, would cause the fare to fluctuate based on earnings of the tramway.

Under the elastic fare plan the control of wages would be in the hands of a regulatory board of three members, one appointed by the Mayor, one by the City Council, and one by the tramway company.

The employees are still urging their demands for a wage scale of 70 cents an hour.

The company has filed petitions, bearing the signatures of thousands of Denver citizens, asking for the submission of the two plans at the November elections.

Zone Plan Recommended

Engineer of California Commission Reports Favorably on System Proposed for San Diego Lines

Establishment of a two-zone system with a 5-cent fare for a ride between any two points in the same zone and a 10-cent fare for one between points in the different zones, is recommended for San Diego, Cal., in the report recently submitted to the State Railroad Commission by Richard Sachse, the commission's chief engineer after a thorough investigation.

Mr. Sachse's report was prepared following hearings before the commission on April 29 and June 17 into the application of San Diego Electric Railway for an increase in fare. Hearings are to be resumed early in September. The report advocates the fare system, suggested by the company, referred to in the issue of the ELECTRIC RAILWAY JOURNAL for May 17, 1919, page 983.

Sees Need of Increase

Mr. Sachse states in his report that some plan of increased fares is necessary if the company is to continue operation. The proposed zone plan contemplates a central zone about 1 mile in radius embracing the business and a great part of the industrial sections of the city.

The 5-cent fare for a ride in any one zone would carry with it free transfer privileges to any point in the same zone, thus permitting a ride of about 3½ miles on a nickel fare. The 10-cent fare for a ride in the two zones would also carry the transfer privilege.

The proposed plan makes provision for regular patrons of the company. Those riding twice a day would be entitled to the following commutation rates:

Round-trip tickets in blocks of four tickets: Good betwen any point, in inner and outer zones, with transfer privilege to inner and outer zones. Good for bearer; sold at 30 cents per block of four tickets, equivalent to 7½ cents per ride.

Ticket book at rate of $4, equivalent to 6⅔ cents per ride. Good for bearer of individual ticket and good for two rides or one round trip each day of the calender month; good for the date printed on the ticket; limited to current month. Transfer privileges in inner and outer zones.

Reasons for Zone Plan

Mr. Sachse gives a number of reasons for urging the establishment of a zone system, among them the following:

In a city of such large area as San Diego (79 square miles) it is a practical impossibility to adhere to the "one city, one fare" plan.

The zone limits proposed for San Diego will give the benefit of the 5-cent fare to the bulk of the population, including the working population.

A zone system will tend to build up the territory within the 5-cent zone, a result that is of benefit to the city as a whole and is more to be desired than the continuing of indiscriminate real estate development within a very large one-fare radius.

The adoption of a zone system is much more likely to secure to the company the necessary additional revenue than a flat increase. This is true because a large amount of short-haul business would be lost to the company under a flat increase, while under the zone system this most profitable part of the business will remain and will continue to increase

St. Louis Presents Its Case

Company Wants Further Fare Advance Until Question of Valuation Has Been Finally Settled

The Public Service Commission of Missouri has completed hearings on the petition of the United Railways, St. Louis, to increase the fares from 6 cents to 7½ cents, when paid in tokens and 10 cents when paid in cash, to abolish the double transfer system and to establish zones on its St. Louis County lines. The United Railways side was presented by Col. Albert T. Perkins, general manager of the company for the receiver, under cross-examination by members of the commission, attorneys for the city and for the Citizens' Referendum League.

Rolla Wells, receiver of the company, had asked the increase immediately after the commission granted a 45 per cent wage increase to all employees. This wage advance, the receiver estimated, would cost $2,740,000 annually. Since the company was losing money on the present 6-cent rate sufficient increase was asked to take care of the additional wage burden.

Mr. Wells claimed that the establishment of the metal token system would simplify the duties of conductors and make returns to the receiver more sure. Under the metal token system the fares for children would be 3 cents by token and 5 cents cash. The double transfer system was attacked on the grounds that it is much abused and is a source of loss. Under these revisions it was estimated that the increase in revenue would approximate $2,075,000 in six months.

Asked how the receipts under the proposed increase would be used, outside of taking care of the increased wages of the employees, Colonel Perkins said that if sufficient funds could be obtained the company would make extensive improvements, give the people better cars, more rapid transportation and all necessary extensions. He said that extensive replacements must be made if the public is to have efficient service.

The question was then asked whether it was true that the deficit of $380,000 for the year ended May 31, 1919, was artificially created, by putting 10 per cent of the gross revenue aside on the books as a reserve and then not holding it in a separate fund, but spending it for other purposes. Colonel Perkins said that if the company set aside 10 per cent of the gross revenue for depreciation that did not necessarily mean there was that amount on hand to expend for the purpose of keeping up the property. The company might have been forced to take some money that was intended for the purpose of replacement and improvement and use it in some other manner. He said that the company had no voice in the matter, for the Public Service Commission of Missouri and the Interstate Commerce Commission arranged a certain form which the company must follow in making its reports. The Interstate Commerce Commission arranged the form and when the Public Service Commission came into being it adopted the same form.

Colonel Perkins on Mr. Mitten

A matter brought up was the statement by Mr. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, to the effect that he wanted more riders at 5 cents, not fewer riders at higher fares. When asked about this, Colonel Perkins said that he was not in possession of the facts and did not care to express an opinion on them. Conditions might be different in Philadelphia, he said.

In his testimony Colonel Perkins touched on the condition of the county lines, saying that they would have had to go out of business long ago if they had been depending on their own revenues. It is proposed to establish fare zones on these lines, under the operation of which it will cost 45 cents to make a round-trip between St. Louis and the more distant suburbs. It now costs 22 cents.

One-Man Cars Suggested by City Engineer

Maj. C. E. Smith, consulting engineer for the city, presented the case for the city against the railway. Major Smith declared that he would stake his reputation as an engineer that he could operate the United Railways successfully on the present 6-cent fare. He outlined his plan for operating the railway as follows:

1. Issue receiver's certificates and purchase $1,000,000 worth of one-man street cars of about thirty passenger capacity to take the place of the large, heavy cars now in operation on some of the lines. There should be at least 200 one-man cars operated, thus saving in wages, depreciation and power costs.
2. Make the county lines pay their own way and, if they failed, issue receiver's certificates to make up the difference.
3. Inaugurate the skip-stop system which should have been retained in operation as during the war-time period.
4. Reroute some of the cars, inaugurating changes in that regard to expedite their movement by cutting down their winding about town.
5. Consolidate trackage where possible.
6. Change the form of keeping the accounts, which now show a deficit where none really exists.

After Major Smith had been subjected to a rigorous cross-examination by attorneys for the company and the attorney for the Citizens' Referendum League had made an argument in which he said the people would bitterly resent the increased fare, the commission adjourned and the members departed for Jefferson City. City Counselor Dawes was given two days in which to prepare a brief for the city. There will be no oral arguments at the final hearing in Jefferson City. The railway officials are anxious for an early decision because the wage increase, estimated at $235,000 a month, went into effect on Sept. 1, and back wages, amounting to $684,000 must be paid by March 1, 1920.

Unlimited Rides for Racinians

An Experiment in Fares that Is Something New and Promising—Plan May Be Extended

On Monday morning, Aug. 18, the Racine division of the Milwaukee Electric Railway & Light Company started an experiment in selling transportation, particularly in the off-peak hours, through the use of a weekly pass. The cost of the pass is $1, which is only 28 cents more than a passenger would have to pay for twelve trips a week at 6 cents a trip. Therefore the person who pays this difference secures all riding in excess of twelve rides a week at a cost which decreases directly as the number of rides increase. By means of this pass it is hoped that people who are now using the cars only for compulsory long riding during the rush hours will be tempted to ride the shorter distances in off-peak hours when riding from home to the shopping districts, to theaters, to make personal visits, etc. A pass-holder also is not inconvenienced by the need for securing change, which is enhanced on a railway that is being operated at an odd fare, nor does the pass-holder have to ask for a transfer.

The passes are of cardboard and of a different color for each weekly period from Monday morning till the following Sunday midnight. The passes are on sale at the central office of the company, on all the cars and through various stores. All sellers of passes, whether conductors or merchants, are charged 98 cents for each weekly ticket. This gives a profit-sharing feature for the conductor. So far as the merchants are concerned, they are at liberty to sell the passes at as low a price as they see fit, to encourage personal patronage and traffic.

A holder in boarding simply shows his pass and goes on into the body of the car. No attempt is made to count the number of rides taken on passes, although this could be done for the traffic checks, auditing, etc. The conductor merely observes the color of the ticket and the date of the week. Everything possible has been done to make the use of the pass frictionless for both the holder and platform man.

In introducing the pass the company published on Aug. 16 the accompanying newspaper advertisement. In addition it secured editorial notice in the local press. Car cards were also used to draw attention to the sale of the passes.

The first week the total number of passes sold was 798, of which 757 were

sold the first day. The number sold for the week beginning Aug. 25 was 962 of which 937 were sold on Monday. The week beginning Labor Day, Monday, Sept. 1, was of course abnormal, but nevertheless 644 passes were sold on the holiday and 188 the following day making a total of 832. It has been observed that the largest purchasers are those who get on the car about 8 a.m., as this class is much more likely to avail itself of lunch-hour riding than men who go to work earlier at the factories and who may have only thirty minutes for the luncheon period. Steps are being taken to show this class of riders how they or their families can benefit from the use of the ticket.

SOMETHING NEW IN STREET CAR FARES

One Dollar Buys a Weekly Pass Which You or Any Member of Your Family Can Use, and Which Is Good for Any Number of Rides Between Monday A. M. and Sunday Midnight.

Beginning next Monday morning, Aug. 18th, we are going to try out an experiment, here in Racine, which some of us think may contain a solution of the country-wide problem of making street car fares support the kind of street car service the public wants.

We are going to sell, at $1 each, weekly passes which you or any member of your family can use, and which will be good for any number of rides between Monday morning and the following Sunday midnight.

You can buy these passes at the Main street station, or from any conductor, on any car, at any time. The passes will be good on city cars within the single-fare limits, and during the week of sale.

Each week the passess will be of a different color, and will bear the date of the week. There will be no punching or other cancelation. No identification of pass bearers will be necessary. Just show the pass to the conductor. Pass holders won't need any transfers—just show the pass to the next conductor. When Sunday midnight comes, all passes for the week past expire, whether they have been used much or little

Regular or frequent car riders can save time and money by using weekly passes. Most of such riders now use more every week than a dollar's worth of tickets or cash fares at present rates. With weekly passes they and their families will ride much oftener, especially during the non-rush hours, shopping and visiting, *because the extra rides won't cost anything.*

We hope to get two results: First, to make the cars earn more money through increased riding. Second, to make them more useful to the community. We believe that if we get either result we shall get both.

One thing is certain—the whole country is going to watch this Racine experiment. If it makes good, it will give Racine an advertisement worth hundreds of thousands of dollars, all over the United States. We hope to have your hearty co-operation in making the new plan a winner.

The Milwaukee Electric Railway & Light Co.

ONE OF THE RACINE ADVERTISEMENTS

In making its announcement the company said that it was going to try out an experiment which might contain the solution of the country-wide problem of making fares support the kind of service the public wants. If it made good it would give Racine an advertisement all over the United States worth hundreds of thousands of dollars.

Study Cincinnati Plan

Street Railway Director W. C. Culkins has been requested by the city authorities of Vancouver, B. C., to send them a copy of the Cincinnati Street Railway ordinance.

Employees' Service Code

One Prepared by W. H. Boyce Gives Valuable Pointers for Trainmen

Codes are popular these days. Every organization has one, from the political party to the local chapter of the Red Cross. Especially are they favored by followers of the road. The carmen of the Beaver Valley Traction Company, New Brighton, Pa., have a code of their very own. Theirs was written by W. H. Boyce, superintendent of the company, and if they live up to it, travel on the Beaver Valley lines must be pleasant indeed. Anyway, they read it, and probably stayed home from the movies to do so. Codes are very important, but, like most important things, are usually dull. Mr. Boyce's code is the exception. Here are some extracts to prove it:

The greatest *service* existing in your work is the *service* the passenger gives you. Funny, isn't it? True though. I said he paid your wages. That's mighty important to you—mine are to me anyway. So, every *service* you can give the passenger will not be any more than he is entitled to—remember that.

But few of the passengers consider you except in the way you serve them in their transportation needs. Do your duty by every one and when the day comes to a close you can in content spend the evening with the folks at home. Violate the rules and circulate your grouch and things won't be pleasant here nor at home.

Let me tell you that the passengers are more valuable to us than you are. We cannot get along without the passengers. So, put in the background or shelve any idea you may have or had, that you are the king pin. You are not—neither am I—the passenger is the important party. Don't forget it.

You represent this company on the cars. From the stockholders down to the smallest official this company is clean, frank and has nothing to conceal. Representing the company you will understand that cleanliness in person, appearance, language, and mind is essential. While the company may be in financial straits yet you receive your wages regularly. Nothing should prevent you from having well appearing uniforms. Pressing and cleaning will help in appearance. Soap and water is the best eliminator for dirt and germs on hands and face.

Never say don't to a passenger of yours. Children are made incorrigible through constant "don'ts" of loving but unthoughtful parents. Don't is argumentative and tends to arouse a desire to do just what is forbid. Never say to a lady, "Don't get off the car backwards." For right away she will think "I'll get off the car that way if I want to and it is none of your business."

You will get better results if you say, *"Please get off the car facing the front."* Too, "move forward" does not mean anything to the people standing in the aisle right at the entrance door. They are on the car and don't realize there is any one else to get on. It is better to say, *"Please step forward in the car so that others may get aboard."*

Service Resumed at Muskegon

Service was resumed on Aug. 20 on the lines of the Muskegon Traction & Lighting Company, Muskegon, Mich., after an interruption lasting two weeks. The company had ceased operation temporarily as the result of riots which followed an attempt to install a 7-cent fare.

Under the temporary agreement reached by the traction officials and the city, the fare case will be submitted to the State Railroad Commission, the fare remaining at 6 cents for one month from the date of the resumption of service. If at the end of thirty days the commission has rendered no decision the railway may charge a 7-cent fare, issuing refund slips to all those passengers paying the extra cent. The Muskegon City Council is at present considering the question of a new franchise for the company. The conditions leading to the interruption of service were described in the issue of this paper for Aug. 16, page 362.

Another New York Line Wants Increased Fares

Following the example of the New York & North Shore Traction Company, which has been granted an increased fare and a zoning system by Public Service Commissioner Nixon, as noted elsewhere in this issue of the ELECTRIC RAILWAY JOURNAL, the Manhattan & Queens Traction Corporation, operating in Queens Borough, New York City, on Sept. 2 also petitioned for increased rates. Immediate cutting off of the service was threatened if higher fares were denied.

The receivers now charge a 5-cent fare from Long Island City to Jamaica, with an additional 3 cents for local service across the Queensborough Bridge. The company proposes to zone its 10-mile line. From the Manhattan terminal of the bridge to Grand Street in Elmhurst, the fare would be 5 cents, while from Elmhurst to the terminus at Sutton Park, 8 cents would be charged.

The petition sets forth that on Aug. 1 its operating loss for the year was $2,784, and its total deficit $284,-104. The receivers assert the 5-cent fare is "unjust, unreasonable and confiscatory." The employees of the road are said to be continuing to work only in expectation of an increased fare giving the company enough funds to meet their increased wage demands.

Commissioner Nixon has referred the petition to Mayor Hylan of New York City for action, declaring that it would be an object lesson in the efficient handling of a difficult situation to let the Mayor handle the problem. In announcing this move, the Commissioner said in part:

The Manhattan & Queens Traction Corporation matter was referred to the Board of Estimate and Apportionment yesterday through the Mayor. This system serves a section housing laboring men, and an interruption of service will work great hardship to them, as there is no elevated or other line they can use.

In the North Shore Line case a great community faced inconvenience and loss and immediate action was necessary that service might be maintained. Efforts are making to break down this aid, in direct opposition to the demands of the people served.

Since the city government has seen fit to oppose the aid given the North Shore, it will be an object lesson in efficient handling of a difficult situation to let the Mayor take up the Manhattan and Queens problem. I had intended to refer this to the city, and the minute the papers arrived did so.

No one is more weary of the daily screeds than myself, unless it is the public.

Just what action the Mayor will take is uncertain. He had said recently:

Increase of fare really seems to have become an obsession with the Public Service Commissioner, and he is apparently prepared to grant an application of this character on the slightest provocation.

Transportation News Notes

Fares Raised in Chickasha, Okla.—The Chickasha (Okla.) Street Railway has been authorized by the Corporation Commission of Oklahoma to increase its fares from 5 cents to 7 cents, with one-half fares for school children. The increased fares apply only within the city limits.

Eight Cents in Girard.—By the terms of an ordinance at Girard, Ohio, accepted by the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, fares between Youngstown and Girard were increased on Aug. 28 from 5 cents to 8 cents with fourteen tickets for $1. Fares to Girard will be 1 cent higher than charged on the Youngstown City Line, and will vary according to the cost of service.

Seven Cents in Hammond.—Service was resumed by the Hammond, Whiting & East Chicago Street Railway on Aug. 29, when the Council of Hammond authorized the company to increase its fares to 7 cents. As a result the company raised the wages of the men to the same scale in effect on the Chicago (Ill.) Surface Lines. This was satisfactory to the trainmen, who had been on strike, and they returned to work.

Way Opened for Seven-Cent Fares.—Ray Rushton, receiver for the Montgomery Light & Traction Company, Montgomery, Ala., has been authorized by the court to apply to the Public Service Commission of Alabama for a 7-cent fare. The court order permits the receiver to install a nine-hour day and to increase wages up to 12 cents an hour if an increased fare is allowed by the commission. The present 6-cent fare was established last September.

Must Restore Low Interurban Fare.—The Michigan Railroad, Kalamazoo, Mich., has been ordered by the Circuit Court to restore 10-cent cash fares between the center of Grand Rapids and Grandville, Wyoming Park and intermediate points. Proceedings against the company for contempt of court were dropped following the announcement that the Michigan Railway, against which the action had been brought, had become the Michigan Railroad.

Aid of Employees Asked.—The Connecticut Company, New Haven, Conn., has addressed an open letter to its employees calling their attention to the fact that their interest is inseparable from that of the company, since they receive 2.9 cents out of every 6-cent fare collected from passengers. The letter, which is in leaflet form, contains charts showing how the company's revenue is spent. Carmen are asked to devote themselves to "selling transportation."

Higher Fares for Ohio Interurban.—The City Council of East Liverpool, Ohio, has passed an ordinance permitting the Steubenville, East Liverpool & Beaver Valley Traction Company to raise fares on its main line under a schedule providing for a 5-cent fare between most of the communities affected. Because of the interlocking interests of East Liverpool and Wellsville, the traction ordinance does not become effective until a similar ordinance is enacted by the City Council of Wellsville.

Will Abolish Half-Fare Tickets.—An opinion has been filed by Judge Youman of the District Court of Appeals at St. Louis, Mo., permitting the Dubuque (Ia.) Electric Company to discontinue the sale of workingmen's half fare tickets. Pending the issuance of the decree the company will continue the sale of such tickets. The electric company operates under a franchise which makes it mandatory for it to allow workingmen, working girls and children who work to ride on the cars during certain hours for a fare of 2½ cents.

Pittsburgh Fare Hearing Sept. 24.—The whole problem of the Pittsburgh (Pa.) Railways will be laid before the Public Service Commission of Pennsylvania at a hearing this month, probably on Sept. 24. The report of the board of valuation engineers is now before the commission. It is expected that the commissioners will have studied its contents before the hearing, so that they will be able to consider the numerous complaints before them, including the protest against the recent increase of fare to 7½ cents, in the light of the valuation report.

Cutting Out the Duplications.—Complete rerouting of the various railway lines of the city of Dallas, Tex., just announced by L. B. Milam, supervisor of public utilities, will result in better service in all parts of the city, it is claimed. The new routings are to go into effect on Sept. 8, and are the result of extensive investigations. The new routings will remove 1594 cars daily from Commerce Street, which was the most congested street of the city. The biggest mileage saving to be effected by the new routings is on the Main-Elm-Lamar loop.

Seven Cents in Montreal.—The Montreal Tramways Commission on Aug. 29 authorized the Montreal (Que.) Tramways to raise its fare from 6 cents to 7 cents. Tickets are to be sold at four for 25 cents instead of five for 25 cents. Five workmen's tickets will be sold for 25 cents. The company's franchise provides for a service-at-cost system under which fares are regulated at the discretion of the commission. The 6-cent fare was authorized in July, 1918. The operation of the franchise agreement was described at length in the ELECTRIC RAILWAY JOURNAL for July 13, 1918, page 78. The new schedule will go into effect eight days after public notice of the advance.

Increased Fares on Michigan Interurban.—The Benton Harbor-St. Joe Railway & Light Company, Benton Harbor, Mich., has received permission from the Railroad Commission of Michigan to increase fares on its interurban lines. The advance in rates is made under the terms of the State law which went into effect on Aug. 14 allowing interurban roads earning less than $8,000 a mile to raise fares to 2½ cents a mile. Under the new schedule the rate from Benton Harbor is raised from 30 cents to 38 cents, while the fare between other points has been advanced proportionately.

Rather Serious Misconduct.—Rolla Wells, receiver of the United Railways, St. Louis, Mo., has refused to be influenced by the recommendation of an arbitration board that heard the case of a conductor discharged for alleged theft of fares and suggested he be merely suspended. Mr. Wells decided not to re-employ the man after the board in its findings admitted that the conductor had been guilty of "misconduct," but advised only temporary separation from his job. This was the first of twenty-six cases that are to be heard by the board.

Seven Cents Asked in Springfield, Ill.—A cash fare of 7 cents with eight tickets for 50 cents is asked by the Springfield (Ill.) Consolidated Railway in a petition filed recently with the Public Utilities Commission of Illinois. The commission last September authorized a 6-cent cash fare and a ticket rate of nine tickets for 50 cents, effective for one year. In support of its plea for a further increase the company cites the fact that in the last year it has had to meet three wage increases, its payroll rising from $149,000 to $223,000 a year. Taxes have nearly doubled during the same period. The Council of Springfield has passed a resolution instructing the city attorney to take steps to oppose the fare increase.

East St. Louis Will Seek More.—It is expected that officials of the East St. Louis & Suburban Railway, East St. Louis, Ill., will prepare a petition for increases in passenger fares. It is not known definitely whether a 7-cent or an 8-cent fare will be asked for the east side lines. The East St. Louis, Columbia & Waterloo Railway will not be in a position to seek increases in rates because the maximum allowed by the Illinois law, 3 cents per mile, is now in effect on that road. Last year the East St. Louis Railway carried more than 14,000,000 passengers. It is estimated an increase of 1 cent in the city fare will add $140,000 annually to the total revenue. The railway companies must meet salary increases which will total $180,000.

Providence Hearings On.—Hearings are in progress before the Public Utilities Commission of Rhode Island into the application of the Rhode Island Company, Providence, for an increase

in fares. The company, which presented three tentative plans of relief at the opening of the hearings, now urges the adoption of Plan B, under which the present zones would be retained and the fare in each zone would be raised to 6 cents. According to the company's officials this plan offers the only hope of preserving operation of the lines until permanent relief can be given by the General Assembly. The proposed system is acceptable to the city of Providence, but is opposed by the suburban towns.

New Publication

Man-to-Man: The Story of Industrial Democracy

By John Leitch. B. C. Forbes Publishing Company, New York, N. Y., 249 pages. Price $2.

This is the brief record of Industrial Democracy wherein the author, as the inspiring force behind the scenes, narrates the solution of the labor problem brought about by himself in twenty large corporations.

Mr. Leitch's method takes for granted that there are two sides to every labor story and the first indispensable requisite to any satisfactory results from it is sheer honesty of purpose both from employer and employee.

From this humble premise, the beginnings of democracy are created by the adoption of a jointly moved business policy for the organization which has nothing less than the religious yet petrified Golden Rule employed practically under the terms: Justice, Co-operation, Economy, Energy and Service. This is the preamble of the business constitution.

The whole idea is based upon our own federal government. The workers are constituted into a voting population who choose from among their peers a House of Representatives; the heads of each department make up the Senate by virtue of their position; and the Cabinet consists of the executive officers of the company, with the president of the company acting as its chairman.

Through this plan of organization, the workers in the corporations in every instance have improved the quality of the product, increased the output from 30 per cent to 300 per cent, and secured bigger pay for labor and bigger profits for capital. Moreover, labor antagonism and dissatisfaction have been eliminated and the whole relation between employer and employee has been put on a new basis. Corollary to these results have come the complete settlement of the hiring and firing problem, the elimination of the strike and lockout; while the *raisons d'etre* of unions have been effaced.

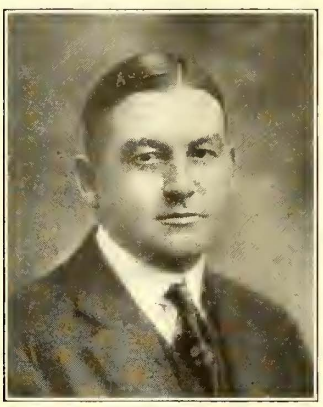
In a larger sense, this form of democracy does not stop as an industrial union, but, as an Americanizing force, automatically takes care of the emigrant question and instills into the minds of the bosses, as well as the workers, a practical knowledge and true regard for genuine American customs and principles.

Personal Mention

Mr. Eagan Made Superintendent

Takes Over Operation of Brooklyn Rapid Transit Line Formerly Under Mr. Dempsey

J. F. Eagan has been appointed superintendent of transportation of the New York Consolidated Railroad, which operates the rapid transit lines of the Brooklyn Rapid Transit System. Mr. Eagan will have charge of transportation, devoting his time to that work exclusively, and taking over part of the duties of J. J. Dempsey, who resigned recently as vice-president in general charge of operation of all the lines in the Brooklyn Rapid Transit system.



J. F. EAGAN

Mr. Eagan joined the Brooklyn Rapid Transit organization as a guard on Jan. 18, 1904, and during his fifteen years of service with the company has risen through every grade in the transportation department of the elevated and subway lines to the head of the department. He was made an inspector in June, 1904; an assistant trainmaster in May, 1907; a trainmaster on Sept. 1, 1913; division superintendent on Sept. 1, 1916, and superintendent of transportation on Sept. 1, 1919.

Mr. Eagan was division superintendent on the southern division of the system before taking charge of the eastern division, and so has a thorough knowledge of all branches of the rapid transit lines of which he is to be chief transportation official.

Before joining the Brooklyn Rapid Transit Company Mr. Eagan secured his groundwork in railroading with the New York, New Haven & Hartford Railroad, working for a time in the New Haven shops. He was born in Hartford, Conn., thirty-eight years ago.

Bayard L. Kilgour has resigned as president of the Toledo, Bowling Green & Southern Traction Company, Toledo, Ohio, on account of pressure of other business.

W. L. Whitlock, formerly office engineer of the Denver (Col.) Tramway, has been appointed superintendent of way of that property. Mr. Whitlock has been in the employ of the Denver Company for the last eleven years, having served in various capacities from rodman in the engineering department to his present position. At various times he has acted as chief clerk of the engineering department, division track foreman, second assistant in charge of track, and office engineer. On July 1 Mr. Whitlock was appointed acting superintendent of way to fill the vacancy made by the resignation of A. M. Evans. His appointment has now been made permanent. Mr. Whitlock has contributed to this paper many interesting and instructive articles on the maintenance-of-way work of the Denver Tramway.

W. H. Timbie, who during the past year has been editor-in-chief for the committee on education and special training in the United States War Department at Washington, has been appointed associate professor of electrical engineering in the Massachusetts Institute of Technology. He will have supervision of the co-operative course in electrical engineering which is carried on by the institute in association with the General Electric Company. Professor Timbie was graduated from Williams College in 1901, shaping his studies with a view to adopting teaching as a profession. Shortly after graduation he took up his work in the applied science department of the Pratt Institute of Brooklyn, and upon the establishment of the Wentworth Institute in Boston he became head of the department of applied science in that institution. He has been very successful in the preparation of books on practical electrical engineering and is active in the A. I. E. E., A. S. M. E., S. P. E. E., and other national engineering and educational societies.

Obituary

William Anderson, an electrical engineer, formerly with the Brooklyn (N. Y.) Rapid Transit Company and the Public Service Commission, died on Aug. 28, at his home in Brooklyn, N. Y. He was graduated from Cornell University in 1911.

Manufactures and the Markets

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

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Car Equipment and Tool Specialties Market

Many Inquiries and Some Orders Received After Long Inactivity—Prices Up With Good Deliveries

Orders for car accessories, such as forgings, armature and field coils, brush-holders and electrical repair tools, show considerable improvement over previous months. No large individual orders have been placed, although the aggregate of all the orders is fair. With few exceptions the material now being ordered is practically all for maintenance work. In some few cases certain articles have not increased in price for a considerable number of months, but this is largely due to a surplus of raw materials, which were obtained before prices were forced up. Although prices of raw materials are considered high, little difficulty has been experienced from shortages in these lines.

A great number of orders are of the rush variety in which the railway operator has waited until the last moment to order and then requires a certain casting or forging by express. With the exception of malleables, prompt deliveries can be had on almost all car accessories and tools. A good volume of orders for car accessories has been placed recently, but these resulted from a number of large orders for cars which have been placed in the East within the last eight weeks.

Overhead Fare Recorder Sales Increase

Business Picking Up Gradually With Prospects of Good Fall and Winter Season

A decided improvement has been noted recently in the condition of the market for fare recording devices. This is especially true for such equipment as has been particularly adapted for use in interurban service. Business continues to be good and contracts for registers for the first six months of 1919 show an increase over the corresponding period of 1918. Furthermore, current sales of these devices, it is learned, are showing a regular increase which manufacturers expect will continue throughout the fall and winter. Prices of one of the best-known lines are firm and no advance has been made.

One manufacturer reports orders during the past few weeks for 193 registers of the interurban type from three railway companies in the Pittsburgh and Louisville districts. In addition a number of smaller orders to companies scattered throughout the Middle West have been reported.

The raw material market is fair and so far as could be learned products are coming through satisfactorily. Deliveries are good and orders on at least one line can be filled from stock.

Wool and Cotton Waste Prices Advance

Heavy Domestic and Foreign Demand Expected to Deplete Stocks by Winter with Probable Price Rise

The market in cotton and wool waste has advanced 2 cents a pound. Heavy buying, both foreign and domestic, has been given as the factor causing the advance. Ordinary white cotton waste for wiping purposes is quoted at 12½ to 14½ cents a pound, cotton waste for journal packing 10 to 14½ cents a pound and mixed colored wool waste for journal packing at 16 to 19 cents.

Supplies at present are ample to meet the demand, but a still higher demand is anticipated in the fall when it is likely that more shipping space will be available for export trade. This increase is expected to diminish greatly the supply with a consequent rise in price about December. England and Scandinavian countries are still buying large quantities of waste for working over into cloth, and it would not be surprising to find Germany the ultimate consumer of that waste going to Scandinavia.

The domestic demand is good and increasing, and more wool is being used for packing. This will continue to be the case as the prices of wool and cotton waste come closer together.

Encouraging Outlook in the Brass Market

Electrical Manufacturers' Demands Are Well Handled — Effect of Recent Labor Disturbances Exaggerated

Electrical manufacturers have little cause for anxiety at present in regard to the supply of brass, notwithstanding recent increases in time of delivery due to labor disturbances in the Naugatuck Valley of Connecticut and elsewhere. An ELECTRIC RAILWAY JOURNAL representative visited this section last week, getting in touch with leading manufacturers of brass. In general it appears that the production rate of the brass mills is now substantially the same as in June. The labor troubles in the brass industries, which began at Ansonia and extended into Waterbury and the adjacent district early in the summer, culminated in a maximum of about 10,000 persons being out of work, whereas about 40,000 others employed in brass making and allied manufactures in the Naugatuck Valley remained loyal. At Waterbury, which produces not far from one-half the brass goods of America, strikes were on for about two weeks, but most of this time the large mills were kept going and the newspapers greatly exaggerated local disturbances of the peace.

LABOR COSTS HIGHER

The prices of copper and of labor have both advanced during the summer, and the former would have necessitated an increase in the price of brass even had labor costs remained stationary. In the Waterbury district unskilled labor in the brass industry received a general increase of 10 cents per hour, following an investigation of living costs, applying to workers earning up to 40 cents per hour. Skilled workers, receiving from 40 cents per hour upward, were granted an increase of 25 per cent, based on the wages of June 1. In general the eight-hour basic day has been established in Waterbury, with an excess allowance of time and one-half. The mills are running ten hours a day in the main, which means that a worker receiving 60 cents per hour before June 30, and earning $6 per day, now draws $8.24 for ten hours. About half the labor is skilled in this industry.

COPPER HOLDING STEADY

The price of copper has risen during the summer from 15 to 24 cents in the ingot. At the time of the strikes in the Naugatuck Valley copper was selling for 18 cents. Plating supplies advanced in price, as did zinc and spelter (the latter up 2 cents). It may be estimated that from 75 to 85 per cent of the selling price of brass is due to the cost of copper, and there is no question that the future prices of brass and the deliveries which can be made in sheets, rods, tubes and in finished products depend far more upon the cost of copper than upon any other single item. For nearly a month now copper prices have been fairly steady. If a further advance should get under way, orders would pour into the brass mills at a rate which would probably upset present deliveries very badly; but if the price remains steady and labor continues to work as at present, it is likely that by the end of this year deliveries will be back to normal.

The following table shows how the base prices of brass and copper as used

by electrical manufacturers increased from June 15 to Sept. 4:

BASE PRICES IN CENTS PER POUND

	June 15 1919	Sept. 4 1919
Sheet Metal:		
High brass	20⅜	27⅜
Low brass	34	30½
Wire:		
High brass	20⅜	27⅜
Low brass	23	30½
Commercial bronze	14½	32½
Rods:		
High brass	19⅜	26⅜
Low brass	23⅜	31¼
Commercial bronze	25½	33½
Brazed tubes:		
Brass	31⅜	39
Copper and commercial bronze	36¼	44¼
Copper:		
Sheet	25½	33½
In rolls	23¼	31¼
Drawn-copper shapes	22¼	30¼
Copper wire, bare (f.o.b. mill)	20	26⅜

These prices include delivery from the mills up to 50 cents per 100 lb. freight rate.

The foregoing base prices illustrate quotations before and after the strikes in the Naugatuck Valley, but the advances are due to the rise in copper cost and only to a small extent to the wage increases. Brass workers at Bridgeport, Conn., received a 10 per cent wage increase in the late spring, but the advance in the copper price was so great that it is doubtful if labor cost has increased the price of brass by more than 1 cent or 1.5 cents per pound in the Naugatuck Valley.

The rising price of copper stimulated the demand of electrical manufacturers upon the brass mills, and in some cases lengthened deliveries by about thirty days. Factory stocks are low, both in finished brass products and in sheets, tubes and rods. The mills are having little difficulty, however, in getting either raw copper or labor, despite a slight shortage of unskilled help reported by one of the larger Waterbury mills. Orders are now being generally accepted with price guarantee to Nov. 1 and sometimes into December.

Most of the mills have at least three months supply of raw materials on hand. Representative deliveries recently quoted are thirty days on seamless tubing, sixty days on sheet metal, four to six weeks on brass wire, and sixty to ninety days on copper wire. The demand for condenser tubing is low at present. The mills did not run full time for several months after the armistice, and were keeping orders well in hand at the time of the strikes. One of the largest mills in the Waterbury district reported last week that the effect of recent labor trouble *per se* on production and deliveries is a thing of the past.

Rolling Stock

Olympia Light & Power Company, Olympia, Wash., is converting all of its cars to safety cars.

Duluth (Minn.) Street Railway expects to put into service within a short time the six Birney safety cars ordered from the American Car Company.

Indianapolis (Ind.) Street Railway has placed an order with the Cincinnati Car Company for twenty-five double-truck prepayment cars similar to the ones now in use.

Lincoln (Neb.) Traction Company, will soon place in service ten single-end Birney safety cars recently purchased from the American Car Company. They will be equipped with Brill American Car Company's 78-in. truck with 26-in. wheels, 258-A motors, G. E. compressor, Peter Smith 3 P. O. heaters, Hunter signs and American Car seats.

Fort Smith Light & Traction Company, Fort Smith, Ark., noted in last week's issue as having purchased some equipment, has placed an order with the National Safety Car & Equipment Company, St. Louis, Mo., for eight safety cars and has also purchased from the Safety Car Devices Company sufficient equipment to change over all cars in service to safety type.

Franchises

Goldfield, Nev.—The Tonopah Divide & Goldfield Electric Railroad has asked the Board of County Commissioners of Esmeraldo County for a franchise to construct a line in Goldfield.

Silverton, Ore.—The Portland & Southeastern Electric Railway has received a fifty-year franchise from the City Council of Silverton for the construction of a line in that city in connection with its proposed line from Mount Angel to Bend. I. W. Foster, Portland, construction engineer. (Aug. 16, '19.)

Jacksonville, Fla.—The Jacksonville & St. Augustine Public Service Corporation has obtained an extension of

NEW YORK METAL MARKET PRICES

	Aug. 12	Sept. 2
Copper, ingots, cents per lb	21.50	22.37½
Copper wire base, cents per lb	26.00	26.00
Lead, cents per lb	6.00	6.00
Nickel, cents per lb	40.00	41 00
Spelter, cents per lb	7.65	7.85
Tin, cents per lb	70.00	55.75 to 56.00
Aluminum, 98 to 99 per cent, cents per lb	31.00 to 33.00	32.00 to 33.00

OLD METAL PRICES—NEW YORK

	Aug. 12	Sept. 2
Heavy copper, cents per lb	18.00 to 19.00	18.50 to 19.00
Light copper, cents per lb	15.00 to 15.50	15.00 to 15.50
Heavy brass, cents per lb	10.00 to 10.50	10.50 to 11.00
Zinc, cents per lb	5.00 to 5.25	4.75 to 5.00
Yellow brass, cents per lb	9.00 to 9.50	9.00 to 9.25
Lead, heavy, cents per lb	5.12½ to 5.25	5.00 to 5.10
Steel car axles, Chicago, per net ton	$29.00 to $30.00	$26.00 to $27.00
Old carwheels, Chicago, per gross ton	$26.00 to $27.00	$25.50 to $27.00
Steel rails (scrap), Chicago, per gross ton	$25.00 to $26.00	$22.75 to $23.75
Steel rails (relaying), Chicago, gross ton	$29.00 to $30.00	$26.50 to $27.50
Machine shop turnings, Chicago, net ton	$10.00 to $11.00	$9.25 to $9.75

ELECTRIC RAILWAY MATERIAL PRICES

	Aug. 12	Sept. 2
Rubber-covered wire base, New York, cents per lb	30	30
Weatherproof wire (100 lb. lots), cents per lb., New York	33	33
Weatherproof wire (100 lb. lots), cents per lb., Chicago	30.75	30 75
T rails (A. S. C. E. standard), per gross ton	$49 00 to $51.00	49.00 to 51.00
T rails (A. S. C. E. standard), 20 to 500 ton lots, per gross ton	$47 00 to $49 00	47.00 to 49 00
T rails (A. S. C. E. standard), 500 ton lots, per gross ton	$45 00 to $47 00	45 00 to 47.00
T rail, high (Shanghai), cents per lb	3	3
Rails, girder (grooved), cents per lb	3	3
Wire nails, Pittsburgh, cents per lb	3.25	3.25
Railroad spikes, drive, Pittsburgh base, cents per lb	3 35	3 50
Railroad spikes, screw, Pittsburgh base, cents per lb	8	7.50 to 9.00
Tie plates (flat type), cents per lb	2.75	2 75
Tie plates (brace type), cents per lb	2.75	2 75
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	3	3
Angle plates, cents per lb	3.90	3.90
Angle bars, cents per lb	3.90	3.90
Rail bolts and nuts, Pittsburgh base, cents per lb	4 35	4.50
Steel bars, Pittsburgh, cents per lb	2 35	2.35
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.20	4.20
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.25	5.25
Galvanized barbed wire, Pittsburgh, cents per lb	4 10	4.10
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.70 to 3.80	3 70
Car window glass (single strength), first three brackets, A quality, New York, discount †	80%	77%
Car window glass (single strength, first three brackets, B quality), New York, discount	80%	77%
Car window glass (double strength, all sizes AA quality), New York discount	81%	79%
Waste, wool (according to grade), cents per lb	14 to 17	16 to 19
Waste, cotton (100 lb. bale), cents per lb	8 to 12½	10 to 14½
Asphalt, hot (150 tons minimum), per ton delivered	.....	.....
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	.....	.....
Asphalt filler, per ton	$30.00	$30.00
Cement (carload lots), New York, per bbl	$2.90	$2.90
Cement (carload lots), Chicago, per bbl.	$3.05	$3.05
Cement (carload lots), Seattle, per bbl.	$3.13	$3.13
Linseed oil (raw, 5 bbl. lots), New York, per gal	$2.25	$2.25
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$2.27	$2.27
White lead (100 lb. keg), New York, cents per lb	13	13
Turpentine (bbl. lots), New York, cents per gal	1.80	$1.80

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

its franchise granted several years ago for its proposed line between Jacksonville and St. Augustine, about 35 miles. Grading has been completed on 7 miles of line and three miles of tracks have been laid. T. R. Osmond, St. Augustine, general manager. (Feb. 17, '17.)

Track and Roadway

Davenport, Springfield & Southern Electric Railway, Springfield, Ill.—An application for a certificate of convenience and necessity for the construction of an electric railway has been filed by the Davenport, Springfield & Southern Electric Railway with the Public Service Commission of Illinois. The main line of the road, which will be constructed first, will extend from Rock Island to Moline, Galesburg, Lewiston, Havana, Petersburg and Springfield, thence to Hillsboro, Greenville, Carlyle, Nashville, Clancyville, Cartersville, Vienna and Metropolis. The proposed road is intended for both passengers and freight. Among those interested are Robert B. Barker, Phillip J. Delaney and Harry Leek, all of Chicago. (Aug. 2, '19.)

Southern Traction Company of Illinois, East St. Louis, Ill.—According to an announcement made by H. D. Mepham, new owner of the Southern Traction Company of Illinois, electric railway connection between East St. Louis and Belleville will be made within the next sixty days. Tracks will be laid to mines in the Belleville district. Bridges are being rebuilt and the roadbed placed in good condition. Plans are under consideration to extend the road to Duquoin. About $1,500,000 will be spent for new rolling stock.

Detroit, (Mich.) United Railway.—The following extensions will be made by the Detroit United Railway in the near future: The Twelfth Street extension; the St. Jean extension; an extension on Warren Street from Berwick to St. Jean and an extension of the Stephenson line to Royal Oak.

Power Houses, Shops and Buildings

Houghton County Traction Company, Houghton, Mich.—A new garage is being built by the Houghton County Traction Company for the accommodation of its electric buses.

Brooklyn (N. Y.) Rapid Transit Company.—Plans are being made by the Brooklyn Rapid Transit Company for the construction of a power station at Kent Avenue and South Sixth Street.

Third Avenue Railway, New York, N. Y.—Plans have been prepared by the Third Avenue Railway for improvement and alternations in its one-story shop at 251 East 133d Street, to facilitate operation. The cost is estimated at $6,000.

Oklahoma, (Okla.) Railway.—Plans have been completed by the Oklahoma Railway for the reconstruction of its terminal station at Oklahoma City, to cost approximately $250,000.

North Coast Power Company, Vancouver, Wash.—A contract has recently been awarded by the North Coast Power Company to N. A. Strand, Kelso, for the construction of a new brick substation near its office building. The company has also begun the reconstruction of its power line from Kelso to Kalama, increasing the carrying capacity to 66,000 volts.

Wisconsin Traction, Light, Heat & Power Company, Appleton, Wis.—Plans are being made by the Wisconsin Traction, Light, Heat & Power Company for the extension of its transmission lines to Dale, Medina and Sherwood.

Trade Notes

American Conduit & Manufacturing Company, New Kensington, Pa., has increased its capital from $540,000 to $600,000.

Chicago (Ill.) Pneumatic Tool Company announces the removal of its Cincinnati office from the Mercantile Library Building to the Walsh Building, Pearl and Vine Streets, where a service station with a complete stock and repair parts will be maintained.

Abrasive Company, Philadelphia, Pa., announces that it has discontinued the use of the name Boro-Carbone as applying to its aluminous abrasive. Hereafter this product will be marketed under its new registered trademark, "Borolon." The company's silicon-carbide abrasive will continue to be trademarked "Electrolon."

Edward N. Lake has organized the Lake Engineering Company which will be located at 139 North Clark Street, Chicago, Ill. He was formerly manager of the Krehbiel Company and also a resident engineer for Stone & Webster. The new company, of which he will be president, will engage in general engineering work.

Van Dorn & Dutton Company, Cleveland, Ohio, recently exhibited a Gleason spiral double gear cutting machine in actual operation of cutting gears from forged steel blanks on the corner of East Ninth Street and Euclid Avenue, Cleveland, Ohio, in a space belonging to one of Cleveland's foremost banks. Gears which were produced on the corners were being made for actual orders. This is only one of the methods used to educate the public.

The American Steam Conveyor Corporation, Chicago, Ill., announces the appointment of Morton McI. Dukehart & Company as its representative in Baltimore and the surrounding territory, including all of Maryland and the District of Columbia and a few counties in Pennsylvania, Delaware, West Virginia and Virginia. This concern consists of Mr. Dukehart and E. S. Denise, both power-plant and sales engineers.

American Malleable Castings Association, 1900 Euclid Avenue, Cleveland, Ohio, maintain a research department for investigations and experiments and for the testing of an analysis of the daily output of each member of the association. Impartial tests are made and the results, together with directions for improvement, are forwarded to respective members. When a member's products have daily met the requirements of the prescribed standard for three months, a certificate of quality is issued that member, who may designate his output as "Certified Malleable Castings."

E. L. Sullivan has been appointed to represent the Green Engineering Company in the Pittsburgh district including western Pennsylvania, eastern Ohio and western West Virginia. Mr. Sullivan has been a special representative for the McDonough Regulator Company for the past ten years in Chicago and in Pittsburgh, and has devoted all of his time to special investigations pertaining to the securing of more efficient boiler and furnace operation. Mr. Sullivan will maintain present offices at 2545 Oliver Building, Pittsburgh, where he will serve in all matters pertaining to the sale of Green chain grate stokers, sealflex arches, steam-jet ash conveyors, cast-iron ash tanks, and replacements for the same.

American Car & Foundry Company, New York, N. Y., announces that James M. Buick, formerly vice-president and general manager, has assumed the direction of the sales division of the company and will be known as vice-president in charge of sales. The production division will be directed by William C. Dickerman, who will be designated at vice-president in charge of operations. He will be assisted by Frederick A. Stevenson, assistant vice-president, who will be head of the manufacturing section, and have charge of production in the car plants, rolling mills and foundries. There will also come under Mr. Dickerman's supervision the engineering, improvement and research, patent and industrial relations sections. The headquarters of both divisions will be at the general offices of the company, 165 Broadway, New York.

New Advertising Literature

Walter A. Zelnicker Supply Company, St. Louis, Mo.: Bulletin on rails, switches, frogs, ties, etc.

Arrow Electric Company, Hartford, Conn.: New 1919 catalog with prices entitled "Wiring Specialties."

W. Roy McCanne, 1050 University Avenue, Rochester, N. Y.: Illustrated folder on reinforced concrete pole bases.

Economy Electric Devices Company, Chicago, Ill.: Bulletin No. 60, giving a description of the Economy railway meters, including the type with inspection dials to indicate when car equipment is to be inspected. Facts are also given on proper acceleration and methods of energy saving.