

# Electric Railway Journal



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## The Electric Railway Is the Sick Man of Business

THUS aptly the electric railway is described in a recent application for higher fares by the San Diego (Cal.) Electric Railway. The disease, in the application, is described as being beyond the comprehension of the family doctor. Therefore, it has been necessary to consult a specialist to prescribe a remedy. In this case the specialist is the Railroad Commission of the State. There is nothing to indicate, according to the application, that the company is financially weak but it is incapable of continuing to maintain its normal strength at present, due to the lack of proper nourishment.

A rather extended abstract of the application is published in this issue because the situation described is typical of the entire industry and also because the ownership at San Diego has been in the same small group continuously since its organization, so that it has been possible easily to compile all facts in regard to its financial history. Here is a property representing an investment of approximately \$6,000,000 which has made possible the development of a growing city, which has always given good service, has been conservatively capitalized and has introduced economies as they have been developed, like the skip stop and the one-man car. Nevertheless it finds itself now in a position where its income is insufficient to pay for additional bond interest and sinking fund requirements or to retire any part of its investment at the expiration of its present franchise. That these conditions are paralleled elsewhere indicates that they are of general, not local cause.

It has been well said that the industry is not suffering from any trouble which more money will not cure. With the diagnosis already made, there should be hope that the illness will not be of long duration and the invalid will soon be prepared again to do his necessary work in the affairs of the community.

## Teamwork and Speed and Special Training Acquired Overseas

ONE of the greatest lessons which the American people have learned from the world war is the amazing speed with which apparently unsurmountable difficulties were overcome by proper organization. The training, discipline and equipment of an enormous army and the transport of this army overseas, together with the continuous supplies of ammunition, equipment and food that were necessary, are achievements which were not dreamed of before the war. This spirit of accomplishing large things by teamwork should do much toward increasing the co-operation desirable in revamping and restoring electric railway equipment which has lost some of its efficiency through deferred maintenance.

The men now returning from army service and entering railway service, particularly in shop work, should be of great assistance in fostering this spirit of doing things. They have learned to do by doing, and they have developed resourcefulness and judgment because they have had to exercise these characteristics to get themselves out of difficulties abroad. These men are returning with keen, alert minds, disciplined to act promptly and thoroughly as members of a team rather than as individuals.

Many of these men have become skilled in standard trades and have been trained in special work. Thus a machinist in the Ordnance Department would naturally be expected to be able to do welding and to maintain the electrical equipment of generators and motors, and many of the carpenters from overseas service have been required to do a large amount of bridge construction. In this way the instinct for industrial work has been developed, and the special training which these men have received should prove of assistance in electric railway maintenance work. Moreover, there has been a necessity for teamwork and speed, qualities which are very useful in a railway organization, just as they are in military campaigns.

## The Safety Car Invades the East

THANKS to the United States Housing Corporation the Connecticut Company is the possessor of twenty one-man safety cars which will help relieve the traffic congestion in Bridgeport and elsewhere. Last Sunday, service with a number of these cars was inaugurated in Bridgeport and, as this issue of the paper goes to press, favorable reports have been received as to the reception of this service by the public. In arranging for this service some rerouting was done to give the cars a "fair show," and headways were cut down to such an extent as to furnish a demonstration of what safety-car service really is. The results obtained in Bridgeport will be helpful in many other places where better service is in contemplation, for the congested section of this city presents many obstacles to good transportation so that the conditions can be considered typical rather than ideal. Realizing the importance of the new service, both locally and in its relation to the general transportation problem, the management of the Connecticut Company spared no pains to safeguard the service from interruption. The crews were thoroughly trained and every incentive was given them to make a success of their new work.

The safety car is one of the few elements of the present electric railway situation which promise the considerable service improvement which is necessary

for profitable operation. That this fact is appreciated is shown by the large proportion of cars of this type ordered in 1918. According to the statistics published in the issue of this paper for Jan. 4, 1919, more than one-third of the 1918 orders were for such cars. These orders were from properties scattered over a wide area. The experience to be gained with these cars during 1919 will be of great value and interest. Cars of this type have great inherent possibilities. The problem, after getting the cars, is to make the most of these possibilities. Careful adaptation to local requirements, increase in service to the full, development of a co-operative spirit in the employees, a well-planned and carefully executed publicity program and belief in the service-producing qualities of the cars will all conduce to success in this direction.

### Service at Cost Versus Cost of Service

**P**RESIDENT R. W. PERKINS of the Shore Line Electric Railway of Connecticut recently made a very apt remark on the present electric railway situation. The occasion was the annual meeting on Jan. 25 of the Connecticut Editors' Association, at which addresses were made by several Connecticut electric railway executives. In his address Mr. Perkins said:

You have all been reading a great deal about service at cost, as if it were something quite new and a sure cure for all the ills to which the street railway is subject.

The service-at-cost principle is fully recognized in the Connecticut laws governing the street railways; every decision by the commission has been founded upon that principle, but the truth is that the law while granting to the public transportation at cost fails to guarantee to the corporation the cost of transportation, and just there regulation fails, for while it can and does protect the public against an exorbitant charge for service, it is powerless to put the corporation in possession of a revenue that shall, in turn, enable it to render the service the public demands.

The condition described in these remarks is very true. For the past fifteen years electric railways have been subject to all kinds of limiting legislation and regulation. Service has been specified by the authorities, transfers have been required, wages have been increased and all kinds of improvements have been ordered. The theory upon which this action has been based is that the oversight exercised and the changes ordered were in the interest of the public and so justified. That they may have been in the interest of the public is true, but the additional burdens put in this way upon the company decreased by just so much its earning ability.

Some people are very insistent in declaring that a railway company should be required to live up to its "contract" and should haul passengers for the amount mentioned in its franchise after that fare, through changing conditions, has become unremunerative. Such people forget that the State itself has changed that contract in its own interest many times since it was signed so that its nature as a binding force has completely changed, even if there were no other reasons for the payment of a fair return to the company for its property used in public service.

It has been held, at least in New York State, that a law which required a gas company to sell its product at a price which was reasonable when the law was passed would become unconstitutional, because confiscatory, if conditions changed so that the company could

not earn a fair return on the value of its property. Such a conclusion seems good law, and it might help in electric railway cases, if not directly by increasing fares, at least indirectly by abolishing some of the transfers and other exactions which have been saddled on the companies since their franchises were obtained.

### The Engineer's Place in Electric Railway Rehabilitation

**T**HERE is one part of the electric railway organization that especially needs safeguarding in these times of stress and distress, namely, the engineering staff. No matter how difficult it may be for the moment to find money to make ends meet, the cars must be kept moving and moving to the satisfaction of the public. Adjustment of differences of opinion between the public and the railway owners as to rates of fare and quality of service will be settled fairly and amicably in due course as both sides come fully to understand each other. In the meantime the properties must not be allowed to run down any further than they are at present; in fact they must be rehabilitated. Good engineering and, therefore, competent and loyal engineers are necessary to this end. Fortunate is the railway management that appreciates this fact; the management whose engineers plan to "stick to the job" at least until they are less urgently needed than now.

There is no use in blinding ourselves to the fact that electric railway engineers are discontented under present conditions. These conditions have been largely beyond the control of the managements. But whatever the cause of the conditions the result must not be the weakening of the engineering backbone of the organization. Most of the engineers now engaged in the upkeep and extension (now all too rare) of the track, structures, line and power plant have been with the railways in prosperous days and "stay by the ship" partly through affection developed when engineering work thereon was more interesting and stimulating. Although they may look with longing eyes to other fields, there is something fascinating enough in this one to hold most of them.

It is significant in this connection to note that those engineers who seem best contented at present are the ones who are helping the managements in the solution of greater than engineering problems. Many, for example, are now working on zoning projects, others are investigating the application of one-man cars and the inauguration of the skip-stop system, while still others are laying out big schemes of expansion for the more prosperous days to come. It is perfectly obvious why these men are better satisfied than others. They are living in the future; they are sharing the hopes and expectations of their employers. The latter appreciate that engineering enthusiasm and virility need food, in the shape of confidence and of tasks that are stimulating no matter how difficult.

An engineer has been aptly defined as one who can do for \$1 what others require \$2 to do. Isn't this just the type of fellow needed in the railway business now? And are not the real railway engineers the mainstay of the managements these days? And is not this the substance of all that has gone before: "If you have good engineers, hold them; if not, get them"?

## Why Not Continue to Save Coal After the War?

**D**URING the past year the shortage of coal and the severe restrictions placed by the Fuel Administration upon its purchase and use have necessitated the most economical operation of power stations in order that the greatest number of kilowatt-hours of energy per ton of coal might be produced. The efforts in this direction have in many cases been greatly handicapped by the fact that plants accustomed and designed to burn high-grade coal have been compelled to burn a coal with heat value greatly reduced from the fuel used in normal times. Many desirable changes have, however, been made, improvements which in many cases could and should have been accomplished without the severe conditions which have made them imperative. Now that many, under duress, have learned of the economies which have long been possible in the generation of power, they look with respect and possibly even with a little jealousy upon those who effected great savings in their power production upon their own initiative.

Much has been said in the past both for and against a bonus system for the power plant. We are inclined to believe that some bonus system is good under almost any condition, but it is clearly understood that a great deal depends upon local conditions and that any bonus plan must be worked out and handled with great care. A very complete and instructive article on the bonus system as used by the Manila Electric Railway & Light Corporation was published in the issue of the *ELECTRIC RAILWAY JOURNAL* for Feb. 16, 1918, page 308. An equally valuable account of the system used by the Denver Tramway appears elsewhere in this issue. In many respects the two plans are similar while in others they differ widely, and as both have proved unmistakably successful it is well to study them carefully.

The Manila system was inaugurated in June, 1915, with 3.5 lb. per switchboard kilowatt-hour output as a standard basis of coal consumption, the coal used having a heat value of 11,715 B.t.u. per pound. This basis was reduced several times until in September, 1917, the standard was 3.08 lb. or 36,000 B.t.u. per kilowatt-hour. The Denver system started in September, 1917, with 3.1 lb. of coal with a heat value of 9500 B.t.u. per pound, or 29,450 B.t.u. per kilowatt-hour, as a standard, and a bonus is still paid on this basis.

Both systems are alike in that they divide 50 per cent of the value of the coal saved each month among the power-house employees. At Manila, however, this bonus is divided among the men according to the relative value of their occupations, while at Denver all receive equal shares. In Denver the plan is that 90 per cent of the bonus is paid out monthly, 10 per cent being retained and paid semi-annually to all men who have been on the payroll for the previous six months or longer. Both companies adhere to the idea that it is best to pay the bonus on some day other than the regular pay day on account of the psychological effect upon the recipients.

At the time the article on the Manila system was published it was estimated that the saving by the end of 1917 would be 18.5 per cent of 41,000 B.t.u., or in other words, that 1 kw.-hr. would be produced with

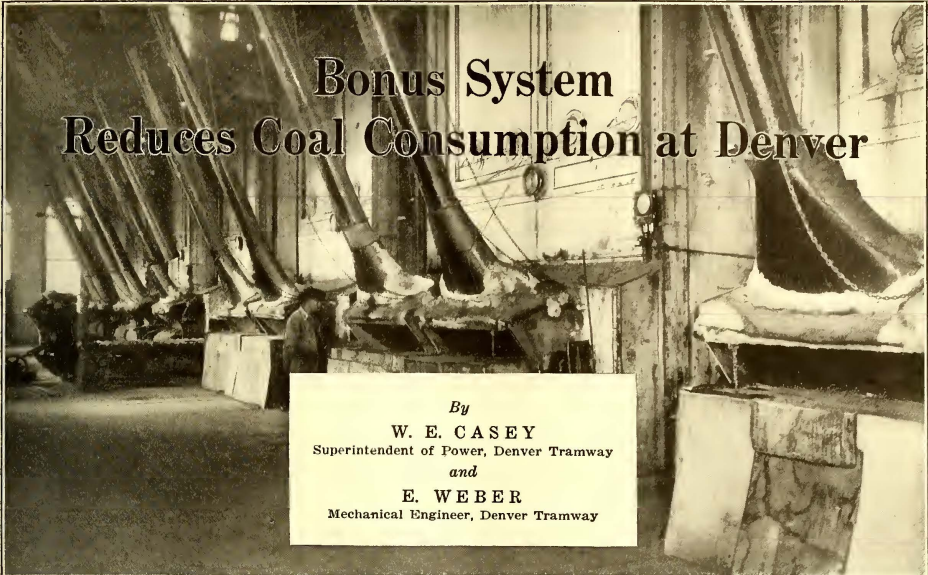
33,415 B.t.u. or 2.85 lb. of coal. This saving was attributed equally to the efforts of the employees and the improvements made in the plant. In March, 1917, the coal consumption at Denver reached 5.1 lb. or 48,450 B.t.u. per kilowatt-hour. A new 300-kw. rotary converter was installed at this time and the consumption steadily decreased until in August it was approximately 3.28 or 31,160 B.t.u. per kilowatt-hour. A new 7500-kw. turbine was installed in August and it was estimated that this would further reduce the consumption to 3.1 lb. or 29,450 B.t.u. per kilowatt-hour. Actually this figure has been reduced to an average of 2.5 lb., or 23,750 B.t.u. (in December the actual figure was 2.43 lb.), which would indicate that this further reduction has been largely due to the efforts of the employees, induced by the bonus plan.

## Study of Accident Causes Leads to Their Reduction

**E**MLOYERS of labor have long known that a high labor turnover is accompanied by an increase in the number of accidents, but real figures on the subject have not always been readily available. Now that the war is over and we may expect greater stability in operating conditions it seems a good time to take stock of the effect of the war on the accident problem. According to some studies made by the General Electric Company, published in a recent issue of *Safety Engineering*, 50 per cent of the accidents which took place within a given period of time occurred to men who had been in the employ of the company less than six months and 80 per cent were due to carelessness. Another point of interest was that the most careful age is 37 while the most accidents occurred to men between the ages of 22 and 26 years and to men over 50 years of age. The experience at the Washington Navy Yard is similar, the lower age limits being 16 to 20 and the higher limit 60. The experience of some of our large steam railways has been that the total annual labor turnover during the war increased from 30 to 50 per cent, the damage to equipment 100 per cent, and 33 per cent of all accidents were chargeable to men who had been in the service less than six months.

These rough figures emphasize the need of thorough training before the new employee is put at a responsible post of duty. They also indicate that the carelessness of youth and the impaired physical faculties of older men are prolific causes of accidents. The figures are therefore of interest to employment agents in connection with the employment of men for a given service. For any railway a complete scientific analysis of all accidents should yield invaluable results both from an administrative and a monetary standpoint. Along this line it may be noted that the experience of the Utilities Mutual Insurance Company of New York has been that marked reductions in the accident compensations of a utility have followed the employment of a safety expert. On more than one electric railway in recent years the portion of gross revenue absorbed by accident claims has been greater than that allotted to dividends. Accident claims are certainly a most unattractive type of disbursement, and if the experience gained from recent abnormal conditions will greatly reduce them the war will have done the industry at least one good turn.





## Bonus System Reduces Coal Consumption at Denver

By  
**W. E. CASEY**  
 Superintendent of Power, Denver Tramway  
 and  
**E. WEBER**  
 Mechanical Engineer, Denver Tramway

750-HP. BOILERS EQUIPPED WITH CHAIN GRATES AND DRAFT GAGES

**I**N THESE DAYS of increased cost of production and operation it will be of interest to many readers of the *ELECTRIC RAILWAY JOURNAL* to learn how the Denver Tramway has succeeded in improving its power plant and, in spite of the increased cost of labor and coal, how it has by greatly reducing the coal consumption per kilowatt-hour kept the burden from rising to an intolerable extent. Shortly after F. W. Hild was appointed general manager of this company he called in E. A. West, then efficiency engineer of the Portland Railway, Light & Power Company and now chief engineer of the Denver Tramway, to make an investigation and report on the power situation which confronted the company. This report showed that it would be best to install a turbine of capacity sufficient to carry the maximum load of the system, and in this way to obtain a better average water rate than was possible with a number of small units.

In order to explain more in detail the improvements which were made in the plant, it will be necessary to enumerate the principal apparatus formerly at the power house, which at the end of the year 1915 comprised the following: Thirteen 415-hp. and six 705-hp. Stirling boilers, all equipped with chain grates, superheaters and economizers; three 800-kw. direct-current cross-compound engine-driven generators, one 1600-kw. direct-current, cross-compound engine-driven generator, one 1500-kw. alternating-current, cross-compound engine-driven generator and two 2000-kw. alternating-current turbo generators. One of the 800-kw. generators had to be scrapped in August, 1916.

**By Installation of New Turbine and Introduction of Bonus System, Coal Consumption on Denver Tramway System Is Reduced to Less Than 2.5 Lb. per Kilowatt-Hour with Saving in Operating Expenses of About \$150,000 per Year**

The new equipment, construction work for the installation of which was started about August, 1916, included one 7500-kw. turbine, hereafter referred to as No. 8 turbine, with surface condenser, and one 300-kw. rotary converter. Due to delays in delivery, the rotary was not placed in service until March, 1917, and the turbine not until August, 1917, but during the time of construction, or rather after the fall of 1915, the power-house performance was watched closely. Suggestions made by employees were carefully considered and many were adopted. At the same time the employees received advice and instruction so as to enable them better to understand their duties.

It was recognized that in order to obtain the full benefit of the equipment, both old and new, a method would have to be found which would give the men some special interest in their work. After a careful study of the subject had been made a plan for a bonus system was drawn up. In July and August, 1917, the power-house employees were given an opportunity to make their comments on the proposed bonus scale, and with some minor changes the plan was put into operation on Sept. 1, 1917, as described in the following order:

### BONUS SYSTEM FOR POWER-HOUSE EMPLOYEES

1. Each employee on the power-house payroll shall be entitled to a bonus, depending on the coal consumption per kilowatt-hour. The method of calculating this bonus will be explained in detail in the following paragraphs:
2. The coal used during each month shall be figured from the mine weights. The amounts of coal on hand in bins shall be estimated by the superintendent of power at the end of each month.

RECORD FORMS USED IN DENVER POWER PLANT IN CONNECTION WITH THE BONUS SYSTEM

The Denver Tramway Company CONDITION OF LOAD

Time 5:55 A.M. Nov. Date 27th 1918

Table with columns: Avg. Load, Max. Peak, Machines in Service No. K. W. Cpt. Rows: A. C. Generated at Platte, D. C. Generated at Platte, D. C. Converted at Delaware, Total System Load.

2-700 H.P. Boilers in service, 1-700, Remarks: 12 Cars Leyden Coal

At top, daily report on load conditions. In center, No. 8 turbine reports, a.m. and p.m. At bottom, temporary watt-hour reading record later transferred to log sheet.

The Denver Tramway Company

Date 11-27-18, Daily Report of Steam Turbine No. 8 Rating 7500 K.W., Report by F. C. Lenson, Unit Started 5:00 A.M., Shut Down 12:55 A.M.

LOAD READINGS table with columns: TIME, A.M., 7, 8, 9, 10, 11, 12, 1, 2. Rows: Pressure of Steam, Int. Stage, Absolute, Barometer, Pump, Bearings, Hydraulic Gear, Temperature return oil Cen. End, No. Valves Operating, etc.

INSPECTION table with columns: Conductor and Pump, Main Governor, Steam Seal, Oil Pumps, Barriers, Strainers, Oil Filters. Rows: Oil, Wheel, Clearance, Brushes, Governor, Rings, Emergency Governor, Cleanliness.

REMARKS: [Handwritten notes]

The Denver Tramway Company

Date Nov 27th 1918, Daily Report of Steam Turbine No. 8 Rating 7500 K.W., Report by Albert Switzer, Unit Started 5:00 A.M., Shut Down 12:55 A.M.

LOAD READINGS table with columns: TIME, P.M., 3, 4, 5, 6, 7, 8, 9, 10, 11. Rows: Pressure of Steam, Int. Stage, Absolute Vacuum, Barometer, Pump, Bearings, Hydraulic Gear, Temperature return oil Cen. End, No. Valves Operating, etc.

INSPECTION table with columns: Conductor and Pump, Main Governor, Steam Seal, Oil Pumps, Barriers, Strainers, Oil Filters. Rows: Oil, Wheel, Clearance, Brushes, Governor, Rings, Emergency Governor, Cleanliness.

REMARKS: [Handwritten notes]

The Denver Tramway Company PLATTE STREET POWER REPORT

WATT-HOUR METER READINGS, PLATTE STREET POWER REPORT, Date Wed. Nov. 27-18

Table with columns: Time, P.M., Readings, K.W.H., A.C. Unit No. 8, A.C. Unit No. 7, A.C. Unit No. 6, A.C. Unit No. 5, A.C. Total Gen. & Con., A.C. Unit No. 4, D.C. From Converter, D.C. Power & Lights, Bank No. 6, Bank No. 7, Bank No. 8, Rotary No. 3. Rows: 3, 4, 5, 6, 7, 8, 9, 10.

Table with columns: Time, P.M., Readings, K.W.H., Coffey Meter No., Clear Creek Meter No., D.C. Total Gen. & Con., D.C. Unit No. 4, D.C. From Converter, D.C. Power & Lights, Bank No. 6, Bank No. 7, Bank No. 8, Rotary No. 3. Rows: 3, 4, 5, 6, 7, 8, 9, 10.

Operator [Signature]

3. The kilowatt-hour output for the month shall be the entire amount generated for the month and shall include station power and light. The amount used for station power generated if No. 8 turbine is in service, and shall not exceed 4 per cent if No. 8 is in repair. Each 5000 kw-hr., or fraction in excess of this amount, shall be figured to increase the coal consumption by 0.01 lb. per kilowatt-hour.

4. Steam used for purposes other than power-house operation shall be credited to coal consumption; 5 lb. of steam used shall be estimated to be equal to 1 lb. of coal, or if such steam is paid for in a lump sum, then each dollar shall be considered equivalent to 1000 lb. of coal.

5. The bonus system is based on the present load characteristic and load factor; if either one or both shall change materially it will constitute a cause for a revision of the bonus scale.

6. If the coal consumption in succeeding months varies more than 0.1 lb. of coal per kilowatt-hour, the chief engineer of the company shall make an investigation before a bonus is paid.

7. The bonus scale is based on lignite coal from the Leyden mine with a heat value of 9500 B.t.u. per pound. If other coal is used the theoretical amount of coal used shall be figured to be in proportion to the heating value of the coal determined by a responsible chemist.

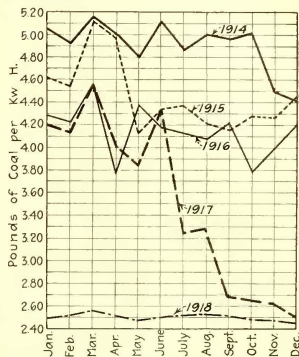
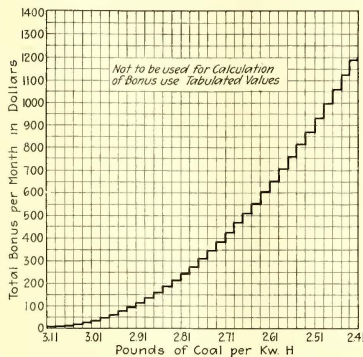
8. The amount of bonus each employee shall receive will be calculated by dividing the total bonus by the number of men on the power-house payroll. In determining the number of men on the power-house payroll, the following rules shall govern:

(a) Extra men taking the place of employees on the sick list shall not be figured as an addition to the number of power-house employees unless on the power-house payroll for a full month or longer. Employees who have been placed on the sick list for six days or longer shall not be entitled to a bonus, but shall be included in the number of power-house employees as long as they remain on the power-house payroll.

(b) Employees taking their vacation shall be included in the number of employees on the payroll and shall receive their bonus, but in case that it is necessary to employ extra men to take the places of men absent on vacation, the total amount of wages paid such extra men shall be deducted from the total amount considered in calculating the bonuses. These extra men shall be entitled to a bonus if they are on the power-house payroll for a full month or longer; but shall otherwise be considered as extra men as outlined above.

9. If No. 8 turbine has to be taken out of service for repairs and the operating force is not at fault, the bonus shall be calculated in the following manner: The output of the old equipment shall be taken at 4 lb. of coal per kilowatt-hour and the corresponding amount of coal deducted from the total monthly consumption. The resulting quantity of coal which will be found, divided by the kilowatt-hour output of No. 8 turbine, shall be used to determine the bonus.

10. If No. 8 turbine has to be taken out of service for repairs due to faulty operation, the whole engine-room crew shall not be entitled to a bonus. In this case each fraction of a month needed to repair No. 8 shall be considered as a full month.

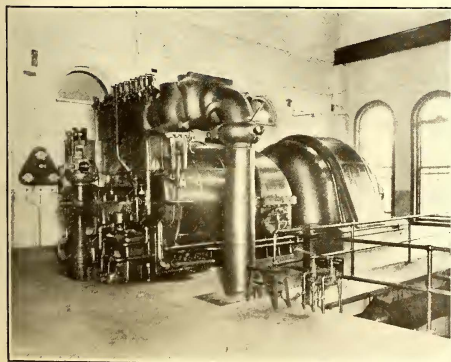


AT LEFT, GRAPHIC PRESENTATION OF POWER-HOUSE BONUS SCALE AT DENVER. AT RIGHT, POUNDS OF COAL PER KILOWATT-HOUR CONSUMED IN DENVER POWER PLANT SINCE 1913

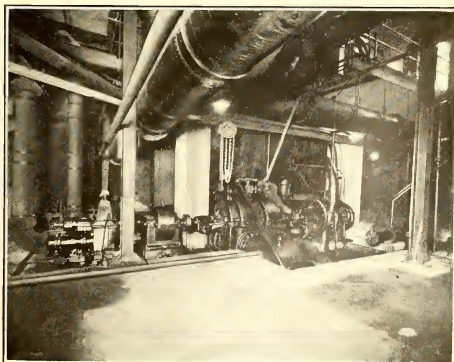
11. No power-house employee shall be entitled to a bonus if, through his fault, damage is caused to the power-house or any of its equipment, and if inspection of any equipment damaged has been overlooked by the foreman to whom this employee reports, he also shall not be entitled to a bonus.

12. In case of power interruption, due to faulty operation, the bonus will be figured for the total number of power-house employees, but the particular employees at fault for the interruption or bad operation shall not be entitled to any bonus.

13. Payment of the bonus shall be made in the following manner: 90 per cent of the total bonus earned will be paid out as outlined above, 10 per cent will be retained, and this sum so retained will be paid out semi-annually to all men who have been on the power-house payroll for the half year or longer just preceding the date at which this last amount is paid.



NEW 7500-KW. TURBINE INSTALLED IN THE DENVER POWER PLANT



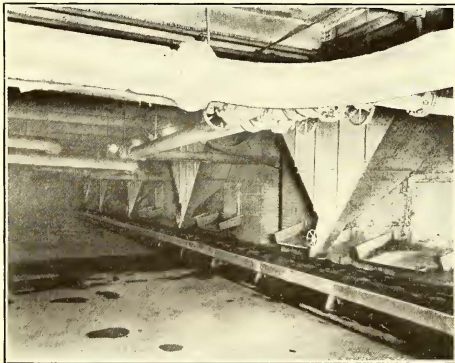
SURFACE CONDENSER AND PUMPS LOCATED UNDER THE TURBINE

14. The following bonus scale shall be used to determine the proper amounts:

Coal per Kilowatt-Hour, Pounds	Total Bonus Per Month	Coal per Kilowatt-Hour, Pounds	Total Bonus Per Month
3.11 to 3.09	\$2	2.75 to 2.73	\$344
3.09 to 3.07	4	2.73 to 2.71	382
3.07 to 3.05	8	2.71 to 2.69	422
3.05 to 3.03	14	2.69 to 2.67	464
3.03 to 3.01	22	2.67 to 2.65	508
3.01 to 2.99	32	2.65 to 2.63	554
2.99 to 2.97	44	2.63 to 2.61	602
2.97 to 2.95	58	2.61 to 2.59	652
2.95 to 2.93	74	2.59 to 2.57	704
2.93 to 2.91	92	2.57 to 2.55	758
2.91 to 2.89	112	2.55 to 2.53	814
2.89 to 2.87	134	2.53 to 2.51	872
2.87 to 2.85	158	2.51 to 2.49	932
2.85 to 2.83	184	2.49 to 2.47	994
2.83 to 2.81	212	2.47 to 2.45	1058
2.81 to 2.77	242	2.45 to 2.43	1124
2.79 to 2.77	274	2.43 to 2.41	1192
2.77 to 2.75	308	2.41 to 2.39	1262

15. If any employees of the power-house should find the bonus, as figured by the auditor, not to be correct, they can appeal to the chief engineer of the company, whose decision shall be final.

The coal used is a Colorado lignite with a heat value of about 9500 B.t.u. per pound as fired, as indicated in the order. The load on the power plant is purely an electric-railway load, of familiar characteristic form. The guarantees for the large turbine and condenser and



BOILER-ROOM BASEMENT SHOWING HOPPERS FOR SIFTINGS FROM CHAIN GRATES AND BUCKET CONVEYORS WHICH CARRY THEM TO OVERHEAD BINS

some tests on the boilers made it probable that it would be possible to produce a kilowatt-hour with 3.1 lb. of coal, as an average for a month, and this was adopted as the standard of fuel efficiency upon which to reckon the savings. If the large turbine is out of order and it is necessary to fall back on the auxiliary equipment, 4 lb. per kilowatt-hour is used as a standard.

#### MANY CHECKING AND ECONOMY DEVICES INSTALLED

The possibility of earning a substantial bonus every month caused every man to consider the losses and how to reduce them. The activity in the boiler room, for instance, was concentrated on stopping air leaks on boiler and economizer settings, while the engine-room force made it a point to use the proper combinations of generating equipment in service. The logsheet and other record forms, reproduced herewith, suggest some of the checking devices installed to assist in the campaign to cut down the coal consumption per kilowatt-hour. In addition recording economy draft gages,

thermometers, steam flow meters, and CO<sub>2</sub> recorders are in use. The CO<sub>2</sub> recorder is used as a portable checking device. In connection with the portable draft gage it gives the desired information concerning the condition of the boiler setting, fire, etc. Flue-gas temperatures are taken at intervals. In the boilers the original Stirling arches have been replaced with flat arches, both for reasons of increased economy of operation and because it was believed the flat arch would stand up better and longer. The flat arches have proved to be superior in both ways.

As a result of the improvements the new turbine-generator takes care of all demands and the balance of the generating equipment is held in reserve. Three 750-hp. Stirling boilers take care of the steam demands. Eleven 415-hp. Stirling boilers, together with their equipment such as stokers, economizers, etc., have been removed and sold at a good price. Two more boilers of the same size, with economizers and chain grates and extra chain grates, are for sale now, and as they are in good condition they will probably bring a good price.

The results obtained can probably be best illustrated by the chart on page 269, showing the coal consumption per kilowatt-hour at the present time to be approximately 2.5 lb. (in December actually reduced to 2.46 lb.) which represents a saving in operating cost of approximately \$150,000 per year. These results are due partly to the better economy of the large turbine and partly to some other less costly improvements in the boiler room, but in no small degree to the introduction of the bonus plan.

#### BONUS HAS AMOUNTED TO ABOUT \$35 PER MAN PER MONTH

A few words concerning the adopted bonus system may be of interest. The coal consumption per kilowatt-hour is figured for the gross output of the station and includes all power used for the plant, amounting to 1.25 per cent of the gross output. If the coal consumption for net kilowatt-hours is desired the correction should be made.

One of the principles used in working up the scheme was so to arrange the bonus scale that the benefits derived from the special efforts of the employees would be divided evenly between the men and the company, and it was also considered better and simpler to pay all men the same bonus. This has amounted to about \$35 per man per month above the regular salary. No especial competition between watches has been encouraged, but as the amount of bonus each man receives at the end of the month depends upon the combined efforts of all, no man is permitted by his companions to "lie down on the job." The daily log sheet, together with the coal book kept by the boiler-room foreman, gives the men all the necessary information so that they can tell where they stand to date on the bonus.

It has been found that the wording of the bonus system order offers sufficient restraint to prevent the employees becoming over-zealous in their efforts, at the expense of the equipment. Thus, in accordance with the order, if No. 8 turbine has to be taken out of service for repairs due to faulty operation, no bonus is paid that month, and if damage is caused to the power house or any equipment through the fault of an employee, he is not entitled to participation in the bonus.



The bonus plan has now been in operation for a little more than one year and no difficulties have arisen. This is probably due to the fact that the whole matter was placed before the men and discussed at meetings prior to the inauguration of the plan, as it was considered very necessary that each man should understand fully the method of calculating his share. One point of interest is that our experience indicates that it is not good practice to pay the bonus on the regular pay day, for in spite of preaching and teaching some of the men form an idea that the bonus is simply wages and not an extra premium for increased efficiency. This point, as a matter of fact, reveals one of the danger marks of the whole bonus system.

Due to the improvements made in the plant, an operating crew of twenty-five men is now required, as compared with fifty-five men formerly. Shifts are now eight hours instead of twelve, and a two-week vacation with pay is granted every man each year. Without doubt the incentive offered by a bonus has increased the economies, and it has also produced a solidarity and co-operation among the operating force which has improved the quality of power service. Cleanliness at the plant is now considered a necessity. Inspection of all parts of the station is made with the greatest care, it being fully understood by the men that laxness may result not only in a pecuniary loss but also in a loss in reputation reflected readily in a decreased amount of bonus earned.

A great deal has been said in the past for and against bonus systems in general, and it is clearly understood that the same system is not suitable for every plant. Our experience, however, with the scheme adopted has worked out exceptionally well not only for both employees and employers, but also for the public in general, through a better utilization of coal and other materials, and an increased reliability in the power supply.

### Experience with Pneumatic Sand Cars

A DEVICE that has proved to be very satisfactory in service is a sand car in which the sand is transported in a steel tank which can be put under air pressure for the purpose of forcing the sand out through a hose or spout close to the track. Cars of this kind have been in use long enough to demonstrate their entire reliability. For example, the Philadelphia Rapid Transit Company put a couple of cars in service early in 1913, and they have operated with entire satisfaction and have not introduced any particular maintenance difficulties. There is no trouble through the clogging of sand in the discharge pipe if the sand is perfectly dry. The ease with which sand can be forced out through a pipe under air pressure is surprising, but a glance at an hour-glass in action will readily convince anyone of the "fluidity" of perfectly dry sand. It is certainly a great convenience to utilize this quality in distributing dry sand to carhouses for redistribution to the cars.

When first put into service the Philadelphia cars had but one source of air which had to provide for braking and also for discharging the sand. This proved to be unsatisfactory in that the cars reached the carhouses without full air pressure on the tank and some time was lost in the pumping-up process. Now separate compressors are used for the two functions, with saving of time and lessening of compressor maintenance.

## Tool List as Aid in Economical Maintenance of Way

### The Pacific Electric Railway Finds Systematic Plan in Posting Tool List to Be Effective in Tool Conservation

BY CLIFFORD A. ELLIOTT

Cost Engineer Pacific Electric Railway, Los Angeles, Cal.

IN 1915 the Pacific Electric Railway maintenance of way department established the practice of posting in its section toolhouses and material yards copies of tool lists for mixed or dirt track sections. This was done to aid in the solution of the problem of supplying tools economically to the sections, and the list as prepared included all tool supplies commonly needed on various parts of the system by section men.

In addition to the lists of tools each poster contains descriptions of the tools furnished by the store department, in order to enable the foremen properly to prepare their requisitions when obliged to order new tools or to send tools into the store for shipment to the company's shops for repairs. The list forms part of the generally established standard system of having a fixed classification of all tools, so that the general storekeeper's and auditor's records and accounts shall correspond when inventories are taken or when documents of any nature involving tools are passed between departments concerned.

Each list as posted, also shows the approximate value of each tool, the price set being high enough to cover ordinary price fluctuations, for the purpose of impressing upon those ordering tools the value of each item and the consequent need for persistent watchfulness against loss and breakage. The lists were printed on white linen cloth so as to render them comparatively indestructible.

Each list comprises tools sufficient for a section gang of six men, for sections working entirely on dirt track and for extra gangs working on dirt or ballasted track or track in paved streets. It is assumed that gangs working on ballasted track or track in paved streets require a more varied assortment of tools than does an ordinary section gang confined entirely to maintenance of dirt track. For this reason, in preparing the lists, two distinctions were made, namely, tool requirements for dirt sections and tool requirements for mixed sections. By the term "mixed section" reference is made particularly to sections which perform maintenance work in city paved streets, as well as on dirt and ballasted track outside of the city lines and on interurban track.

During 1917, after the United States entered the war, it was deemed expedient to revise the tool lists in view of the acute shortage of supplies and of the exorbitant prices prevailing. This was done to show the section foremen and their subordinates the relative prices of tools in 1917 as compared with 1915. In revising and reposting the list, the idea was firmly to impress upon the men that tools not only represent so much physical property but that they represent a great deal of money. The purpose was not only to impress the importance of strict economy but also to impel conservation of materials because the company had found it extremely difficult to secure tools of certain standard makes which in peace times it had found to be economical to use.

## Private Operation with Public Ownership Seems the Best Solution

By THOMAS E. MITTEN

Chairman, Executive Committee, Philadelphia Rapid Transit Company

**D**AVID LLOYD GEORGE, the Prime Minister of England, is credited with the following epoch-making utterance:

*We must sweep aside prejudices. The difficulty, believe me, is not with interests, it is with prejudice. And that is equally true in every business. People talk about the vested interests. It is not the vested interests I am afraid of, it is vested prejudices. Sweep these away and the State can easily deal with interests. You must not take any man's property away. You cannot build a great State on dishonesty. You are bound to come to grief if you attempt it.*

Therein I believe lies the only hope of a right solution of these great reconstruction problems.

The street railways of the United States form a most vital part of the circulatory system of the business and industrial world, and, if we are to maintain our new leadership in international affairs, they must be made to function properly.

To keep pace with the new order of things, much remedying of our street railway systems will be required. Many of the city traction lines of the United States to-day are in the hands of receivers, others are resorting to increased fares in a futile endeavor to solve their problems, and most of the remaining companies are apprehensively anticipating the future.

The company of which I am the operating head has been able to keep wages up to the standard set by the national war labor board and fares down to a basic charge of 5 cents.

Broadly speaking, the development of street railways has been not so much in the direction of public good as for the advantage of property owners and promoters.

In many cities original grants were made to competitive companies, and lines are still being built to advance real estate values and further private interests. There has, therefore, been a great duplication of tracks, with consequent increased expense of track maintenance and operation.

The high rate of return received by investors in the earlier horse-car days proved to be bonanzas for those who, knowing little and caring less of that which might be in store for the future, considered all earnings available for dividends without regard to the wearing out of the property and the consequent gradual extinguishment of the original investment.

Electricity was later heralded as being the agency to increase speed and also reduce the cost, and thus make for greater profit. It was with this thought that our cities generally required of their street railways large compensation for the right to electrify; this added charge extended in some instances to a complete paving and maintenance of the entire streets on which cars were to be operated.

Franchises have been granted to politicians for hold-up purposes and have then necessarily been purchased by the street railway companies.

The sum of such purchase has been almost invariably



T. E. MITTEN

added to the cost of the property, so that the burden now carried generally is composed not only of actual costs of development from horse cars to the present modern street railway systems, but, in addition, they have had to carry the cost of duplications, the profiteering of the promoter and the price of peace to the politicians.

The remedy largely lies in the re-arrangement of existing street railway lines so that the public may be properly served without maintaining tracks on streets not necessary to proper service.

The prime requisite is, of course, that the cars be so operated as to give the most satisfactory service to the greatest number of people, and that the car rider shall receive the maximum possible for the fare paid.

To correct the injustice of the car rider being obliged to pay for that which represents private gain, it would seem necessary that ownership of street railways be vested in the cities served. By this means only does it seem possible to apply corrective measures with a sufficiently firm hand to insure the revision of the existing lines and the planning of the new, with proper regard for the interests of all.

Municipal operation has not, so far as known, been satisfactorily accomplished in this country. The principle of operating with "service at cost" supplies a well-sounding phrase, but if the management is to be either politically controlled or supplied by inexperienced or incompetent trustees, the result in either case is bound to be disappointing. The successful carrying of a large volume of traffic with a very slight margin of profit must necessarily require an operating management possessing both skill and experience, and there should be a measure of reward commensurate with the service rendered and the results secured.

Co-operation with labor, so much to be desired and so seldom secured, is the keystone of all accomplishment in providing satisfactory service to the public.

The highest wage is the cheapest pay when the men and management unite in a common understanding that the underlying principle of their relation is a good day's work for a good day's pay.

An assured profit fails to supply the necessary incentive to insure either the frugal expenditure of money or the combating of unfair demands from other interests. In other words, the management that has the deciding voice in making expenditures should always stand to lose its reward if guilty of extravagance or incompetence.

The summing up of the foregoing actually points to city ownership and private operation, and if the latter be undertaken under fair and equitable terms and the execution is effective, then the fact that the community served is in a position to cancel the undertaking and change the management will serve not only to keep the management effective but, for the reason that the change can be quickly and easily made, is the greatest assurance that such action will not be taken in a hurried or unwise manner.

# Application No. 3808

## History of San Diego Electric Railway Told in This Request for Relief Made to California Railroad Commission Proves that Rectitude Affords No Guarantee that Income Will Exceed Outgo

ONE of the most interesting documents ever presented to a regulatory body by an electric railway is the application for relief recently made to the Railroad Commission of California by the San Diego Electric Railway as of Nov. 1, 1918. The petitioner does not attempt to specify the form of help desired, leaving such action to the commission.

Before an abstract of this application is presented it is well to point out the almost unique position of the San Diego Electric Railway. It has nothing to live down in over-capitalization, extravagance of earlier managements, failure to give good service or any other accusation of that kind. On the contrary, it presents the remarkable example of an undertaking that for a long period of years has given far more to the community than it has received, because the property was controlled by the Spreckels family which has kept on putting more and more money into the railway because of its faith in the future of San Diego. It will be seen,

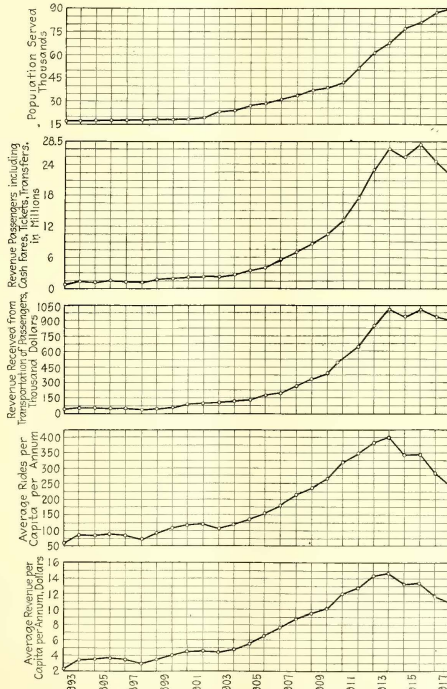
however, that the jitney, the private automobile and the war have proved too much even for the patience and the pocket of a Spreckels. This application, which is abstracted in the following paragraphs, was prepared for the San Diego Electric Railway by E. J. Burns, public utility adviser, San Diego. The application opens with an extract from a speech made by Max Thelen, then president of the Railroad Commission of California, before the University of California Extension Course, March 6, 1918, in which he pointed out that when a street railway asks for relief it must come prepared to show that it has eliminated all unnecessary expense and has introduced all economies of operation compatible with the continuation of reasonably good service to the patrons. Among these features Mr. Thelen classed skipstops, elimination of needless car mileage, reduction of heating and use of one-man cars. Following this appears the correspondence

of last February between President Wilson and Secretary McAdoo urging that state and local authorities afford prompt relief to the public utilities.

### SAN DIEGO DEVELOPED BY ITS STREET CARS

Taking as a guide, the sentiments expressed by Messrs. Thelen, Wilson and McAdoo, Mr. Burns begins by saying that the first obligation of an electric railway is to produce and furnish the traveling public with the most efficient service it can afford to give. The city of San Diego would not have grown so rapidly if the San Diego Electric Railway had not been so keen to take advantage of the rapid improvements in electric railway equipment.

Like other street railways, the system had its beginnings in a number of small, disconnected horse lines. The cars weighed about 1500 lb. each, seated ten to fifteen passengers, cost say \$1,500 each and ran on 12-lb. to 30-lb. rail. The present cars weigh 43,500 lb., seat fifty-two passengers and run on 60-lb. to 114-lb. rail. The system grew from 10 miles to 86 miles. The only thing common to the old times and the present day is the 5-cent fare. The system made possible the development of outlying districts, but if it is now held down to a fare that will not pay for good service a decline in values and a stoppage of development will inevitably occur. Since good service cannot be maintained without an increase in revenue the property owners should not put forth the argument that higher fares will tend to decrease the value of their property. In any event, the value of the real estate is due largely to the railway, and if it is necessary to adjust the rates of fare, it would appear that possibly some adjustment will be necessary in realty values. At no time has the railway itself exploited any land in the city of San Diego or outlying districts. Therefore, it has not benefited by additions or extensions other than from



THESE GRAPHS SHOW OPERATING RECORDS AT SAN DIEGO FOR THE LAST TWENTY-FIVE YEARS, TOGETHER WITH STATISTICS OF POPULATION AND RIDING HABIT

its transportation business. The electric railway spent more than \$1,000,000 in extra car, power and terminal facilities to take care of the business expected at the time of the 1915 exposition, but it did not receive enough income from transportation in return to pay its operating expenses, depreciation charges, taxes and bond interest. This result was due to unfair jitney competition, permitted in direct contravention of the railway's exclusive franchise, and it cost the San Diego Electric Railway between \$400,000 and \$500,000. This loss from jitney competition is small, however, compared to that caused by the depreciation of the railway's securities.

Up to 1913 the business of the railway kept pace with the growth of the city. The city has continued to progress but not the railway.

#### WHY MORE CAPITAL MUST BE RAISED

To interest capital it is necessary to offer an investment that appears to have a future. Investors in street railway securities now know that the business is de-

**T**HE public utility regulations do not permit the railway to earn a sufficient surplus during good times to take care of the poor years. Therefore, when costs go up, rates should likewise go up. The car riders should bear in mind that the relief now asked for should have been requested at a much earlier date.

—From *San Diego Application*

creasing; that it requires a larger annual investment than in the past to produce the same commodity but that the price paid for the commodity is the same, and that the chances for a fair rate of return are discouraging. To invest in street railway securities is not even an interesting game of chance. The prospective investor knows perfectly well beforehand that he will lose and is no longer willing that the public should get street railway service at his expense.

From its organization twenty-six years ago to Dec. 31, 1917, the railway has expended approximately \$6,000,000 for construction, new property, extensions, improvements and betterments. No matter how good this property is to-day, it will not last forever. Consequently, the company will be faced by some very difficult problems as the time for replacements approaches because:

The income from operation has not been sufficient to set aside a depreciation or deferred maintenance fund;

The income has not been sufficient to pay for additional bond interest and sinking fund requirements;

The income has not been sufficient to pay any return whatsoever on outstanding capital stock since 1914;

The cost of replacing the property now worn out has increased from 50 to 200 per cent without a corresponding increase in quantity of business;

The general forty-one-year franchise expires in thirty-two years, so no refunding bond issue is possible;

The company's past experience proves conclusively that it will be necessary to reconstruct the property every fifteen years during the life of the present franchise;

The expenditures necessary to replace the property during the life of the present franchise will not be less than \$6,500,000. This added to the \$6,000,000 already invested in the property makes a total investment of \$12,500,000. The present income of the company is insufficient to set aside one dollar to retire this investment at the expiration of the present franchise.

The company is required by law to render adequate service, to extend its facilities from time to time within the territory served, to make large expenditures for street work, changes in grade, etc.

The variation in earning power makes the electric railway industry hazardous from the investor's viewpoint, and the uncertainty of the return makes a difficult situation to overcome in securing capital for future replacements or improvements.

There is a marked tendency on the part of some of the newspapers and the people of California toward municipal ownership. This must receive serious consideration by investors or prospective investors in public utility securities.

#### IS THE FRANCHISE AN ASSET OR A LIABILITY?

Under the uniform system of accounting, officially accepted by the California Commission, Account No. 545, Franchises, provides that the franchise account shall include actual amounts paid to a state or political subdivision thereof in consideration of franchises, etc. The San Diego Electric Railway has every reason to believe that the value of its franchise should be carried on the liability side rather than on the asset side of its books due to the burdens imposed upon the carrier in its endeavor to live up to all the franchise requirements. The cost of the franchise works out as shown in Table I:

TABLE I—TOTAL COST OF FRANCHISE

Cost of franchise.....	\$36,000
Cost of initial paving.....	507,000
Cost of maintaining paving.....	200,000
Bond interest initial paving.....	129,000
Cost of franchise tax *.....	165,000
Total.....	\$1,028,000

\*2 per cent of gross receipts to date.

Of the foregoing sum, \$696,000, or \$116,000 a year, was spent between 1912 and 1917 inclusive. During the latter period the taxable gross operating revenue was \$5,700,000, or \$950,000 a year. This means that the actual franchise tax has been 12.2 per cent of the taxable gross operating receipts during the period 1912-1917.

During its entire life, from 1892 to 1917 inclusive, the San Diego Electric Railway has paid in cash \$603,000 more to the city for the privilege of conducting transportation than it has to the stockholders who furnished the money for the construction of the transportation facilities.

The electric railway is no different from any other industrial enterprise as regards the relation between cost of manufacture and selling price. In this case the commodity produced is transportation. When the cost of manufacturing transportation advances, the selling

price must also advance if the quality of the commodity is to be maintained. Yet in the case of street railways, the popular thought is that the selling price of transportation should be the same regardless of increases in the cost of manufacture. How this condition can be maintained without killing the industry has not been explained. Nothing could show more clearly than this the need for a common understanding and co-operation on the part of the public, public service commissioners and utility operators.

In San Diego or any other city it certainly should not be expected that the capital was invested solely to provide the community with transportation. When the present investors made possible the city's transportation system, that investment was made for the purpose of receiving a fair profit.

To figure intelligently the net result of manufacturing transportation, the elements of cost should first be considered. These include labor and material for maintenance and operation; charges for depreciation of physical plant; taxes and interest on bonds and loans. Deduct these charges from the income received, and the remainder is profit. If there is a remainder it goes to the investor who made possible the production of the commodity, transportation. If nothing remains, then the investor, as in the case of the San Diego Electric Railway, is "out of luck." As a matter of fact, the San Diego stockholders have received no profit on their capital stock since the year 1914.

#### DEPRECIATION IS AN ELEMENT OF OPERATING COST

Mr. Burns then points out that the standard system of accounting allows only for normal or every-day maintenance and operating expenditures but not for the cost of depreciation due to inadequacy, age or obsolescence. Replacement due to obsolescence is one of the most important items of depreciation. It represents the cost of keeping up to date.

Replacements merely represent maintenance or operating expenditure and therefore should not be charged to capital account unless the cost of replacing in kind exceeds the original investment of the replaced property. The necessity of making replacements, due to depreciation, occurs over a period of years; hence the necessity of a replacement fund to replace worn-out property promptly.

Book figures and guessing are no longer admissible in allowing for depreciation. Local conditions and the past experience of the utility must be considered. The uniform system of accounts provides depreciation accounts in which to include monthly charges to cover depreciation of way and structure, equipment, power plant buildings and power plant equipment for creating reserves. Since July 1, 1914, the accounts also provide that carriers shall accrue depreciation on equipment included in accounts 530 to 535 inclusive, but the accrual of depreciation of way and structures, power plant buildings and power-plant equipment is left optional with the carrier until such time as the commission may direct otherwise.

There is no apparent good reason why the classification should not require the carrier to accrue depreciation on all classes of depreciable property. The thought that it should not be necessary to accrue depreciation

on way and structure and power-plant buildings and equipment for the reason that safe and economical operation necessitates constant maintenance of such units to a point of efficiency of their original physical condition is very misleading. Steam and interurban track can be maintained in a high state of excellence without interrupting the service, partly because of the open construction and partly because of the long headways. However, street railway service is operated at headways from one to ten minutes. In most cases the track is imbedded in concrete pavement, so that when renewals occur it is not merely a question of replacing rails but of an entire section of track or pole line. This makes it difficult to draw the line between depreciation and maintenance. Therefore, it would appear to be much better to include monthly charges to cover depreciation of way and structures, power-plant buildings and power-plant equipment in the same manner as the classification provides for the accrual of depreciation of equipment.

Prior to Jan. 1, 1915, it was the policy of the San Diego Electric Railway to accrue depreciation on way

**T**O INVEST in street railway securities is not even an interesting game of chance. The prospective investor knows perfectly well beforehand that he will lose and is no longer willing that the public should get street railway service at his expense.

—From San Diego Application

and structures, equipment, power-plant buildings and power-plant equipment. However, due to the decrease in the railway's income and the increase in the railway's outgo, this depreciation program was changed on the date named. For the present, only accruals are being made on equipment as required by the uniform classification of accounts. The railway in changing its depreciation program did so only until such time as the income from the operation of the property would be sufficient to make monthly charges to cover all depreciable property. During the years 1912 to 1917 inclusive, \$600,535 was charged through the operating accounts as a reserve for accrued depreciation as shown by the following figures:

Way and structures.....	\$238,468
Power plant.....	102,108
Equipment.....	259,959
Total.....	\$600,535

Of this amount \$69,900 has been debited to reserve for accrued depreciation, leaving a balance of \$530,635, which was reinvested in the property.

This money was used principally in financing improvements during 1915 and 1916, as it was impossible to sell the bonds authorized for that purpose at the price set by the commission. This depreciation fund is now urgently needed to make replacements of worn-out or obsolescent equipment.

In the San Diego Electric Railway, the fund for

accrued depreciation was reinvested in the property for additions and betterments, and the use of this money dispenses with the necessity of additional interest-bearing capital until such time as the fund is needed for its original purpose. The time has now arrived when that money is needed, but due to the decrease in the railway's securities, it is impossible to convert the investments in which the money was invested into cash without a large discount and additional burdens to the fixed charges. The \$530,635 representing reserve for accumulated depreciation already reinvested in the property would entail a considerable additional burden on the fixed charges. Of the \$4,497,000 bonds (face value) authorized by the commission on Oct. 6, 1914, 3920 \$1000 bonds were sold at 85 per cent, netting \$3,332,000, and there still remain unissued 577 bonds of the par value of \$577,000, or \$490,450 if sold at 85. The net proceeds received from the sale of these bonds would be insufficient to return the entire reserve for accrued depreciation by \$40,185. In the second place, if the bonds could be sold at 85 per cent of their face value, the railway would be compelled to increase its annual fixed charges as follows:

Sinking fund requirements.....	\$5,770
Discount.....	380
Interest at 5 per cent.....	28,850
Total.....	\$35,000

Therefore, the cost of money per annum to replace the fund for accrued depreciation would amount to 6.55 per cent.

The income from operation is insufficient to care for this additional burden, and there is no reason to doubt that the commission would refuse to sanction a future bond issue as the income would be insufficient to pay bond interest and sinking fund requirements. Short-term notes at a much higher rate of interest are also out of the question. Another chance for the return of the depreciation fund would be the sale of stock or a stock assessment. The result of such a course may be guessed from the circumstance that the stockholders received no dividends at all for the first fifteen years, 1892 to 1908, and for the last three years, 1915 to 1917. The stockholder ought to be protected the same as the bondholder.

TABLE II—INCOME AND OUTGO FOR THE YEAR ENDED DEC. 31, 1917

	Amount	Per Cent
Income		
Revenue from transportation of passengers.....	\$892,166	94.22
Revenue from other railway operations.....	44,245	4.68
Non-operating income.....	10,451	1.10
Total.....	\$946,863	100.00
Outgo		
Operating expenses (includes \$172,165 uncharged depreciation).....	841,802	88.91
Taxes assignable to railway operation.....	74,264	7.84
8 per cent return on book cost of physical property, amounting to \$5,193,385.....	415,486	43.87
Total outgo.....	\$1,331,553	140.62
Outgo exceeds income by amount of.....	384,689	40.62
Necessity and Disposition of 8 Per Cent Return on Investment		
Interest on \$3,842,000 bonds at 5 per cent.....	\$192,100	46.23
Bond retirement sinking fund.....	39,200	9.44
Amortization of bond discount and expense.....	14,776	3.56
Interest on unfunded debt.....	18	0.01
Conductors' and motormen's accident fund.....	13,125	3.16
Miscellaneous income deductions.....	482	0.12
Entries direct to profit and loss.....	31,797	7.65
6 per cent dividend on \$1,250,000 capital stock.....	75,000	18.05
To surplus.....	48,986	11.78
Total.....	\$415,486	100.00

Another matter of vital importance to the stockholder is that of securing additional capital required in excess of the depreciation fund at the time of making replacements. Equipment purchased ten years ago and depreciation accruals based on costs at that time and charged off yearly during the useful life of such equipment, will not be sufficient to provide adequate capital to replace the equipment when it is outworn. Assume a mile of track constructed in 1910 with 60-lb. rail at a cost of \$30,000 per mile and assume its life as ten years, also that one-tenth of the original cost has accrued annually during its useful life. By 1920, however, the carrier would discover that the cost of replacement was not \$30,000 but \$60,000. Where is the additional capital, \$30,000, to come from? The problem would be simple if there were a progressive growth of the business, but not if the business has stopped growing or even declined. In brief, the railway is then in the same position as the jitney-bus operator who existed off of his investment.

#### OUTGO EXCEEDS INCOME

It would seem clear that the serious financial situation of the San Diego Electric Railway is due to the need of rates of fare that will yield more revenue than that now paid by the consumer for the commodity transportation. To furnish efficient service at a price less than the cost of production is nothing short of confiscation. There should be no half-hearted relief. The people of San Diego might just as well understand that only permanent relief will save this railway from the fate of its predecessors. The railway's financial condition is not the result of over-capitalization, corrupt methods, frenzied finance or the payment of large and exorbitant dividends to the stockholders. In fact, Commissioner Thelen himself said on Sept. 29, 1912, in connection with Application 1206 of this company: "There is no question about your honesty in the past. This corporation is one of the most honest utilities I have run across."

Table II illustrates clearly the need for some immediate relief, showing the income and outgo for the year ending Dec. 31, 1917; the income and the outgo per dollar of business are shown in Table III, while the operating data for the year ending Dec. 31, 1917, are shown in Table IV.

Table III shows that the deficit for the year ending Dec. 31, 1917, was \$384,689. Table III points out that the investment in physical property represents \$5.57 per dollar of business. The income was but 18.2 per cent on the investment, whereas 25.6 per cent was necessary to come out even. It cost the railway \$1.406 for each \$1 of business handled.

TABLE III—INCOME AND OUTGO FOR EACH DOLLAR OF BUSINESS DONE IN YEAR ENDED DEC. 31, 1917

Income:	
Operating revenue.....	\$0.989
Non-operating income.....	.011
Total income.....	\$1.000
Outgo:	
Operating expenses.....	\$0.889
Taxes assignable to railway operation.....	.078
8 per cent return on book cost of physical property.....	.439
Total outgo.....	\$1.406
Recapitulation:	
Income.....	\$1.000
Outgo.....	1.406
Outgo over dollar of income.....	\$0.406

Again, Table IV shows that for every revenue car-mile run there was a loss of \$0.1058. During the year, 14,864,600 cash-fare passengers were carried. The income at 5 cents per passenger was \$749,047.80. The revenue ticket passengers carried amounted to 3,913,911, yielding \$143,118.86, or \$0.9365 per revenue ticket passenger. To yield sufficient revenue to pay all expenses as shown in Table II, the rate of fare per cash passenger would have been \$0.0753 and the rate of fare per revenue ticket passenger would have been \$0.94.

During 1917, the average income per revenue passenger, which includes cash fare and revenue ticket passengers, was \$0.0504 and the average outgo per revenue passenger was \$0.0716. Therefore, the outgo per revenue passenger was \$0.0212 more than the income.

Every effort has been made by the company to effect economies along the lines laid down by Commissioner Thelen in his address before the University of California. The skip stop was established as early as June 1, 1916, and has now been carried to the point where 625 stops have been reduced to 486, a reduction of 139. Considering 636 as the number of total stops possible, there had been eliminated 150 by July 1 or a little more than 23 per cent. The average probable stops eliminated is two and one-half per trip for all of the lines where skip stops have been installed. By means of the "Economy" watt-hour meter, a number of tests were made with both a center-entrance car and a California type car which was typical of those converted to one-man operation. These tests indicated that the skip stop would save 350,600 kw.-hr. a year. The saving, however, is by no means proportionate to the reduction in energy requirements. Labor and certain fixed items are not affected at all. Fuel and water, however, can be reduced in direct proportion, and it may be assumed that this would also hold true of lubricants and miscellaneous power-plant supplies. It

is estimated that during 1919, the total output of the San Diego plant will amount to 11,040,000 kw.-hr., while the cost of fuel, water, lubricants and miscellaneous items will amount to say \$116,395, making the cost per kilowatt-hour \$0.0105. Therefore, the 350,600 kw.-hr. saved mean only a net saving of \$3,681 on the power-house end.

As early as July 1, 1915, the railway began to eliminate all such unproductive mileage as could be discontinued without hardship to the public.

The privately-owned automobile is making serious inroads in the passenger revenue. Just how to meet this competition is a serious question. There are more permanent residents in San Diego now than in 1913, but the railway is carrying fewer passengers per capita per annum. The advent of the private machine has

changed the whole aspect of the electric railway situation as now there is competition. A few years ago a ten-minute headway with an average speed of 9 m.p.h. was considered *de luxe* service, but the public has since been educated to faster and more frequent service. If the electric railway expects to stay in business, it must meet these new conditions. Therefore, care must be exercised in curtailing service. In Mr. Burn's opinion, nevertheless, the time when the automobile will replace the street car is far distant. On this point he quotes from one of John A. Beeler's reports on the Washington traffic situation,

**T**HE electric railway is no different from any other industrial enterprise as regards the relation between cost of manufacture and selling price. In this case the commodity produced is transportation. When the cost of manufacturing transportation advances, the selling price must also advance if the quality of the commodity is to be maintained. Yet in the case of street railways, the popular thought is that the selling price of transportation should be the same regardless of increases in the cost of manufacture. How this condition can be maintained without killing the industry has not been explained. Nothing could show more clearly than this the need for a common understanding and co-operation of public, regulators and operators.

—From San Diego Application

in which Mr. Beeler showed that at Fifteenth Street and New York Avenue, for example, it was observed that 1135 autos carried only 2144 persons or an average of 1.89 persons per vehicle whereas 203 street cars carried 7541 passengers or 37.15 per vehicle. Mr. Beeler also found that it takes less than three seconds longer to pass a street car, carrying nearly forty persons, through a given intersection, than it does to pass an automobile carrying less than two. (See ELECTRIC RAILWAY JOURNAL for July 27, 1918, page 147.)

At San Diego, the practice of neighbors picking up friends in their machines had grown greatly. To learn what this kind of competition and other factors were doing, the company made a traffic survey between the hours of 7 and 9 a.m. on Aug. 15, 17 and 21, 1918, at four points with the results shown in Table V.

This survey showed an average of 1.75 passengers per competitive vehicle and 22.61 passengers per street car.

TABLE NO. IV—OPERATING STATISTICS FOR YEAR ENDED DEC. 31, 1917

Total investment (book value) physical property	\$5,193,585 00
Miles of track owned	74 06
Investment per mile of track	\$70,126 72
Investment per dollar of business	\$5 54
Revenue car-miles operated	3,653,428
Revenue Passengers Carried:	
Cash-fare passengers	14,864,600
Revenue ticket passengers	3,913,911
Revenue transfer passengers	3,194,643
Total revenue passengers carried	21,973,154
Income and Outgo per Revenue Car-Mile:	
Income per car-mile, cents	26 04
Outgo per car-mile, cents	36 62
Deficit per car-mile, cents	10 58
*Income and Outgo per Revenue Passenger:	
Income per revenue passenger, cents	5 04
Outgo per revenue passenger, cents	7 16
Deficit per revenue passenger, cents	2 12
* Includes cash fare and revenue ticket passengers only.	

TABLE V—VEHICLES COUNTED IN TRAFFIC SURVEY

Class of Vehicle	Number	Passengers
Automobiles	652	1,205
Motorcycles	50	54
Bicycles	42	44
Total of above	744	1,303
Street cars	70	1,583

Operation with one-man cars began as early as Feb. 19, 1916, and at present four lines are so equipped. The cars used at present are 40-ft. rebuilt California type, seating forty-four and weighing 34,100 lb. each. They replaced 48-ft. center-entrance cars seating fifty-two and weighing 43,500 lb. each.

The principal saving effected consists of platform and power expense. This amounts to \$27,124.35 per annum or \$0.437 per car-mile, as shown in Table VI.

During September, 1917, the company equipped 100 cars with "Economy" watt-hour meters, which have also been the means of reducing the energy consumption per car-mile. Comparison of the year 1918 with the year 1917 shows a decrease in energy consumption of 3.11 per cent; comparison of 1918 and 1916 a decrease of 8.5 per cent and of 1918 with 1915, a decrease of 15.41 per cent.

It is impossible to trace the power economies through the operating accounts due to the continued increase in the cost of fuel oil. In order to show the relative value of what results have been obtained, Table VII has been prepared, based on the 3,900,000 estimated car-miles for 1919, showing the cost of operation per car-mile based on 2.8 kw.-hr. per car-mile which is the estimated consumption average for the year 1919, and 3.31 kw.-hr. per car-mile, representing the power consumed during the year 1915. By consuming 2.80 instead of 3.31 kw.-hr. per car-mile, the saving in energy would amount to 1,989,000 kw.-hr. At present, 182 kw.-hr. are produced per barrel of fuel oil. On this basis, 60,000 barrels would be needed to produce the 10,920,000 kw.-hr. estimated for 1919. The number of barrels saved by reducing the car-mile consumption from 3.31 to 2.80 kw.-hr. would be 10,928 or \$18,796.16. The allocation of the several classes of power saving is shown in Table VIII.

The efficiency of the company's plant is not apparent from a survey of the operating accounts due to the continued increase in the cost of fuel oil. In 1916, the company paid 66½ cents per barrel for fuel, and during 1918 it had to pay \$1.45. The increased cost of this item amounts to \$39,322.72 or 118.04 per cent. It is now estimated that the price of fuel oil will advance to \$1.72 in 1919. Table IX shows the increased efficiency of the power plant, from which it will be seen that in comparing the year 1919 with 1914, the increase in the output per barrel of fuel oil is 15.2 kw.-hr. or 9.11 per cent and the decrease in the cost per kilowatt-hour \$0.00086 or 8.34 per cent, a total saving of \$10,196.16 in the cost of fuel oil. This saving is attributed to the Merit Automatic Oil Stroking System which was installed the latter part of 1917.

The total economies effected per annum by the company are:

Skip-stop operation	\$3,681
One-man car service	27,124
Car economies	14,598
Power plant economies	10,196
<b>Total</b>	<b>\$55,519</b>

THE ELECTRIC RAILWAY IS THE SICK MAN OF BUSINESS

In summing up the situation, the electric railway might be considered the sick man of business, so sick that the disease is beyond the comprehension of the

TABLE VI—ECONOMIES EFFECTED IN THE OPERATION OF ONE-MAN CAR SERVICE PER ANNUM

Item	Route No. 5	Route No. 6	Route No. 8	Route No. 13	Total
Cars operated	4	2	2	2	10
Car-miles per annum	265,400	115,000	99,300	140,525	620,225
Car-hours per annum	28,105	14,200	13,870	13,651	69,826
Car-miles per car-hour	9.44	8.09	7.16	10.3	9.00
<b>Operation of Two-Man Car Service</b>					
Platform expense per annum	\$22,192	\$11,096	\$9,986	\$11,095	\$54,370
Platform expense per car-mile	\$0.0836	\$0.0964	\$0.1009	\$0.0789	\$0.0876
Kilowatt-hours consumed per car-mile	2.8	2.8	2.8	2.8	2.8
Kilowatt-hours consumed per annum	\$0.015	\$0.015	\$0.015	\$0.015	\$0.015
Cost of power per annum	743,120	322,000	278,040	393,470	1,736,630
Cost of power per car-mile	\$6.68	\$3.81	\$2.919	\$4.31	\$18,234
Total platform and power expense per annum	\$0.0294	\$0.0294	\$0.0294	\$0.0294	\$0.0294
Total platform and power expense per car-mile	\$0.1130	\$0.1258	\$0.1303	\$0.1083	\$0.1170
Weight of equipment, pounds	43,850	40,520	40,520	43,850	142,185
<b>Operation of One-Man Car Service</b>					
Platform expense per annum	\$12,344	\$6,059	\$5,767	\$6,680	\$29,851
Platform expense per car-mile	\$0.0471	\$0.0526	\$0.0580	\$0.0404	\$0.0481
Kilowatt-hours consumed per car-mile	2.4	2.4	2.4	2.4	2.4
Cost per kilowatt-hour	\$0.0105	\$0.0105	\$0.0105	\$0.0105	\$0.0105
Kilowatt-hours consumed per annum	636,957	276,000	238,220	337,260	1,488,537
Cost of power per annum	\$0.0252	\$0.0252	\$0.0252	\$0.0252	\$0.0252
Cost of power per car-mile	\$0.0042	\$0.0042	\$0.0042	\$0.0042	\$0.0042
Total platform and power expense per annum	\$19,082	\$8,957	\$8,269	\$9,221	\$45,430
Total platform and power expense per car-mile	\$0.0717	\$0.0778	\$0.0832	\$0.0656	\$0.0733
Weight of equipment, pounds	34,100	34,100	34,100	34,100	34,100
<b>Decrease from Operation of One-Man Cars</b>					
Platform expense per annum	\$9,847	\$5,037	\$4,219	\$5,415	\$24,510
Platform expense per car-mile	\$0.0371	\$0.0438	\$0.0429	\$0.0385	\$0.0395
Kilowatt-hours per car-mile	0.4	0.4	0.4	0.4	0.4
Kilowatt-hours consumed per annum	106,163	16,000	39,720	56,210	248,090
Cost of power per annum	\$1,114	\$485	\$417	\$590	\$2,604
Cost of power per car-mile	\$0.0042	\$0.0042	\$0.0042	\$0.0042	\$0.0042
Total platform and power expense per annum	\$10,962	\$5,520	\$4,636	\$6,005	\$27,124
Total platform and power expense per car-mile	\$0.0413	\$0.0480	\$0.0471	\$0.0427	\$0.0437
Weight of equipment, pounds	7,750	6,420	6,420	7,750	8,085

TABLE VII—POWER ECONOMIES UNDER PRESENT ENERGY PER CAR-MILE AS COMPARED WITH THE ENERGY CONSUMED

Item	IN 1915		Decrease	Per Cent
	Kw.-Hr. per Car-Mile	Kw.-Hr. per Car-Mile		
Car-miles operated	3,900,000	3,900,000		
Kilowatt hours consumed per car-mile	2.80	3.31	0.51	15.41
Kilowatt-hours consumed per annum	10,920,000	12,909,000	1,989,000	15.41
Total barrels of fuel consumed	182.0	182.0	10,928	15.41
Cost of fuel per barrel	\$1.72	\$1.72		
Total cost of fuel	\$103,200	\$121,996	\$18,796	15.41
Cost per car-mile	\$0.0264	\$0.0312	\$0.0048	15.38

TABLE VIII—POWER SAVING AT SAN DIEGO

	Kilowatt-hours	Barrels Oil	Money
Skip-stop plan	350,600	1,926.37	\$3,313
One-man operation	248,093	1,363.15	2,344
Car efficiency meters	1,390,307	7,639.05	13,129
<b>Total</b>	<b>1,989,000</b>	<b>10,928.57</b>	<b>\$18,796</b>

TABLE IX—INCREASED POWER PLANT EFFICIENCY

Item	1919		1914		Decrease	Per Cent
	Kw.-Hr. per Barrel Fuel	Kw.-Hr. per Barrel Fuel	Kw.-Hr. per Barrel Fuel	Kw.-Hr. per Barrel Fuel		
Kilowatt-hours produced	11,840,000	11,840,000				
Cost of fuel per barrel	182.0	166.8	15.2	9.11		
Total cost of fuel	\$111,894	\$172,000	\$60,106	8.35		
Cost per kilowatt-hour	\$0.00945	\$0.01031	\$0.00086	8.35		



family doctor. Therefore, it has been necessary to consult a specialist to prescribe the remedy. In this case, the specialist is the Railroad Commission of the State of California. There is nothing to indicate that the San Diego Electric Railway is financially weak, but it is incapable of continuing to maintain its normal strength at present, due to the lack of proper nourishment.

The railway assumed that it had reached during 1913 a stage of development in which the revenue received from its transportation business was sufficient to pay necessary operating expenses, set aside a depreciation reserve, pay taxes and earn 6.5 per cent return on the physical value (book value) which amounted to \$3,740,000, as of Dec. 31, 1917. The company considered that it had reached a point determining the soundness of its investment (which conclusions were drawn at that time from the books), and that the promised prosperous future dreamed of by its investors for many years was at hand, but out of a clear sky appeared the following combinations which could not be foreseen and which were entirely beyond the control of the management: (1) The freeze, (2) hard times due to freeze, (3) jitney competition, (4) enormous increase in private automobiles, (5) decreased tourist travel due to war, (6) flood of 1916, (7) increased taxation, and (8) increased operating expenses due to war.

All of these facts had a tendency to raise the cost of manufacturing transportation while there was no corresponding increase in the price paid for the commodity.

The public utility regulations do not permit the railway to earn a sufficient surplus during good times to take care of the poor years. Therefore, when costs go up, rates should likewise go up. The car riders should bear in mind that the relief now asked for should have been requested at a much earlier date.

In an appendix, Mr. Burns gives an extended story of the history and organization of the San Diego Electric Railway.

### Cost of Labor Turnover

According to figures cited by the Training Service, Department of Labor, the cost to American manufacturers of preventable labor turnover is \$1,250,000,000 a year. Magnus W. Alexander, a recognized authority, is quoted by officials of the service as estimating the cost of hiring a man at from \$10 to \$200, and the average charge against the employer on this account as more than \$50. The number of workers in the United States is reported to be 40,000,000, of whom one-fourth are in the manufacturing industries. On the basis of a turnover of 250 per cent for the nation at large, the number of hirings in the manufacturing industries alone would be 25,000,000 a year, and at \$50 each the cost would be \$1,250,000,000. A complete elimination of labor turnover would mean the saving of this great sum.

The Detroit (Mich.) United Railway is overhauling and painting from 95 to 125 cars per month. This means that the paint shop force is working on about forty cars at a time. The work will be continued until all rolling stock is in first-class condition.

## Portable Stone Crusher Saves Cost Every Year

**Omaha Company Crushes 935 Cu.Yd. of Stone in a Period of Six Months at an Actual Saving of \$1,500**

THE Omaha & Council Bluffs Street Railway, Omaha, Neb., has for the past five years been using in its maintenance-of-way department a portable stone crusher manufactured by the Universal Crusher Company, Cedar Rapids, Iowa. This equipment has been used to crush vitrified brick, old concrete, and other materials formerly considered of no value and hauled to the dump.

Several years ago the railway company was obliged to lay 1 mile of double track in a street already paved with brick. All of the brick removed during the con-



OLD CONCRETE SALVAGED BY PORTABLE STONE CRUSHER AT OMAHA

struction, a total of 2,300 cu.yd., was run through the crusher on the job at an average rate of 60 cu.yd. per ten-hour day with a force of ten or eleven men. The crushed brick was used as a coarse aggregate for the new concrete and also as ballast. As ballast the brick has given excellent service during the past four years. During the first six months of 1918 the Omaha Company crushed 935 cu.yd. of material at a cost of 72 cents per cubic yard in place, while at the same time crushed stone in the pile cost about \$2.32 per cubic yard. This represents a saving of approximately \$1,500. The original cost of the machine was \$1,200, so that the outfit has paid for itself many times over since purchased. The average amount of material crushed per year at Omaha is 1,200 cu.yd.

In Omaha old concrete, brick, etc., when not required for immediate use, is stacked at the yards, and during the winter months when the men have little else to do these materials are crushed. The accompanying photograph shows four men crushing old concrete at the yards. Two men shovel the material from the ground, one is stationed on the platform, and the fourth man, who is the motorman of the work car, acts also as supervisor of the crushing. In the photograph crushed concrete is shown in the process of being elevated to the work car and transferred to another location.

# Determining the Characteristics of Metallic-Electrode Arc Welds

By Testing and Inspection of Welds a Reliable Indication of Their Soundness May Be Obtained

By O. S. ESCHOLZ

Research Engineer Westinghouse Electric & Manufacturing Company

THE four factors which determine the physical characteristics of metallic-electrode arc welds are fusion, slag content, porosity and crystal structure. Some of the other important methods that have been suggested and used for indicating these characteristics are:

1. Examination of the weld by visual means to determine: (a) Finish of the surface as an index to workmanship. (b) Length of deposits, which indicates the frequency of breaking arc and, therefore, the ability to control the arc. (c) Uniformity of the deposits, as an indication of the faithfulness with which the filler metal has been placed in position. (d) Fusion of the deposited metal to the bottom of the weld scarf as shown by the appearance of the under side of the welded joint. (e) Predominance of surface porosity and slag.

2. Chipping the edges of the deposited layers with a cold chisel or calking tool to determine the relative adhesion of deposit.

3. Penetration tests to indicate the linked, unfused zones, the slag pockets and the porosity by: (a) X-ray penetration. (b) Rate of gas penetration. (c) Rate of liquid penetration.

4. Electrical tests, showing variations, due to incomplete fusion, slag inclusions and porosity in: (a) Electrical conductivity. (b) Magnetic induction.

These tests if used to the best advantage would involve their application to each layer of deposited metal as well as to the finished weld. This, except in unusual instances, would not be required by commercial practice in which a prescribed welding process is carried out.

Of the above methods the visual examination is of more importance than is generally admitted. Together with it the chipping and calking tests are particularly useful. The latter test serves to indicate gross neglect by the operator of the cardinal welding principles, because only a very poor joint will respond to the tests.

## PENETRATION TESTS MOST RELIABLE

The most reliable indication of the soundness of the weld is afforded by the penetration tests. Obviously the presence of unfused oxide surfaces, slag deposits and blowholes will result in a varying degree of penetration. Excellent results in the testing of small samples are made possible by the use of the X-ray. However, due to the nature of the apparatus the amount of time required, and the difficulty of manipulating the apparatus and interpreting the results, it can hardly be considered at the present time as a successful means to be used on large-scale production.

The rate at which hydrogen or air leaks through a

joint from pressure above atmospheric to atmospheric, or from atmospheric to partial vacuum can readily be determined. The equipment, however, would be quite cumbersome, and the slight advantage in time reduction over liquid penetration is not of sufficient importance to warrant consideration for most welds.

Of the various liquids that may be applied kerosene has marked advantages, due to its availability, low vola-

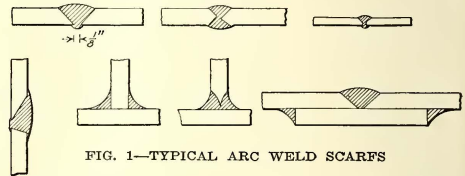


FIG. 1—TYPICAL ARC WELD SCARFS

tility and high surface tension. Sprayed on a weld surface kerosene is rapidly drawn into any capillaries produced by incomplete fusion between deposited metal and weld scarf, or between succeeding deposits, slag inclusions, gas pockets, etc., penetrating through the weld and showing the existence of an unsatisfactory structure by a stain on the emerging side. A bright red

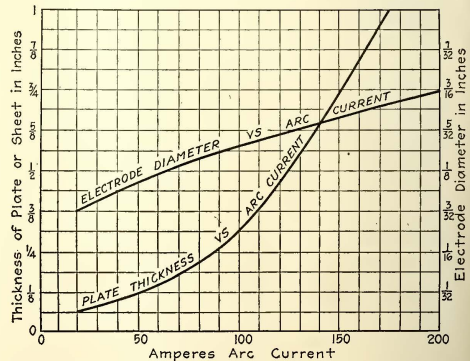


FIG. 2—APPROXIMATE ARC CURRENT AND ELECTRODE DIAMETERS FOR WELDING STEEL PLATE OF VARIOUS THICKNESS

stain can be produced by dissolving suitable oil dyes in the kerosene. By means of this test the presence of faults has been indicated that could not be detected with hydraulic pressure or other methods. By kerosene penetration a sequence of imperfect structures linked

through the weld, which presents the greatest hazard in welded joints, could be immediately located. This method, however, is not applicable to the detection of isolated slag or gas pockets, nor of small disconnected unfused areas, but a weld may contain a considerable number of distributed small imperfections, without affecting its characteristics to a great extent.

If a bad fault is betrayed by the kerosene test it is advisable to burn out the metal with a carbon arc before rewelding under proper supervision. By the means of sand blast, steam, gasoline, etc., large quantities of kerosene are preferably removed. No difficulty, however, has been encountered on welding over a thin film of the liquid.

Electrical test methods by which the homogeneity of welds is determined are still in the evolutionary stages. Some of the difficulties to be overcome are the elimination of the effect of contact differences, the influence of neighboring paths and fields, and the lack of practicable,

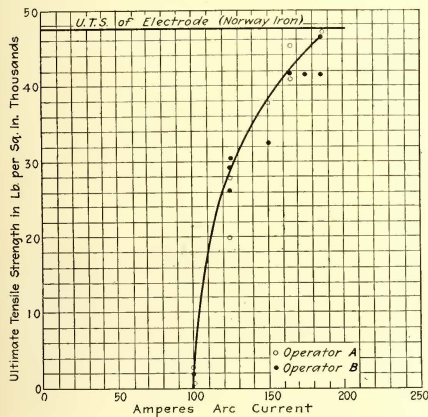


FIG. 3—VARIATION IN WELD STRENGTH WITH CHANGE IN ARC CURRENT

portable instruments of sufficient sensitiveness for the detection of slight variations in conductivity or magnetic field intensity. No simple tests are possible, except those which involve subjecting the metal to excessive stresses, for determining the crystal structure. Control of this phase must be determined by the experience obtained from following a prescribed process.

#### CARDINAL STEPS IN ARC WELDING

In common with all other operations, metallic-electrode arc welding is readily susceptible to analysis. Regardless of the metal welded with the arc, the cardinal steps are: (1) Preparation of weld. (2) Electrode selection. (3) Arc current adjustment. (4) Arc length maintenance. (5) Heat treatment.

Sufficient scarfing is involved in the preparation of the weld, as well as the separation of the weld slants, so that the entire surface is accessible to the operator with a minimum amount of filling. When necessary to avoid distortion and internal stresses due to unequal expansion and contraction strains, the metal is preheated or placed so as to permit the necessary movement

to occur. Various types of scarfs in common use are shown in Fig. 1.

The electrode selection is determined by the mass, thickness and constitution of the material to be welded. An electrode free from impurities and containing about 17 per cent carbon and 5 per cent manganese has been found generally satisfactory for welding low and high carbon, as well as alloy steels. This electrode can also be used for cast-iron and malleable-iron welding, although more dependable results can be obtained by brazing, using a copper-aluminum-iron alloy electrode with the aid of some simple flux. Successful results are obtained by brazing copper and brass with this electrode. The diameter of the electrode should be chosen with reference to the arc current used.

Many concerns have attempted welding with too low a value of arc current, and the result has been a poorly fused deposit. This is due largely to the overheating characteristics of most electrode holders which lead the operator to conclude that the current used is excessive.

The approximate values of arc current to be used for given thicknesses of mild steel plate, as well as the electrode diameter for a given arc current may be taken from the curve in Fig. 2. The variation in the strength of welded joints 1 in. square with the strength of welding current is shown in Fig. 3.

Notwithstanding that electrode development is still in its infancy, the electrodes available are giving quite satisfactory results. However, considerable strides can yet be made (with its further evolution) in the ductility of welds, consistency in results, as well as in the ease of utilizing the process. A short arc is usually maintained by a skillful operator, as the work is thereby expedited, less electrode material is wasted, and a better weld is obtained due to improved fusion and to decreased slag content and porosity. On observing the arc current and arc voltage by meter deflection or from the trace of recording instruments the inspector has a continual record of the most important factors which affect weld strength, ductility, fusion, porosity, etc. The use of a fixed series resistance and an automatic time lag reset switch across the arc definitely fixes both the arc current and the arc voltage, and thus places these important factors entirely beyond the control of the welder.

#### HEAT TREATMENT IS DESIRABLE

The method of placing the deposited layers plays an important part on the internal strains and distortion obtained on contraction. It is possible that part of these strains could be relieved by preheating and annealing, as well as by the allowance made in preparation for the movement of the metal.

The heat treatment of a completed weld is not a necessity, particularly if it has been preheated for preparation and then subjected to partial annealing. A uniform annealing of the structure is desirable, even in the welding of the small sections of alloy and high carbon steels, if it is to be machined or subjected to heavy vibratory stresses.

The inspector, in addition to applying the above tests to the completed joint and effectively supervising the process, can readily assure himself of the competency of any operator by submitting sample welds to ductility and tensile tests or by simply observing the surface exposed on cutting through the fused zone, grinding its

face and etching with a solution of one part concentrated nitric acid in ten parts water.

It is confidently assumed, in view of the many resources at the disposal of the welding inspector, that this method of obtaining joints will rapidly attain successful recognition as a dependable operation to be used in structural engineering.

### Maintenance of Car Lamps

BY OTTO GOTTSCHALK

Master Mechanic Richmond Light & Railroad Company, New Brighton, N. Y.

THE maintenance repairs to car-lighting systems consist chiefly of lamp replacements, socket inspections and inspection and adjustment of switches. One of the greatest sources of trouble is the breakage of lamp filaments. The life of tungsten lamp filaments in car service, where they are subjected to severe vibration, is greatest when they are kept burning continuously. Tungsten metal when hot and soft can be subjected to a severe vibration and not become broken. When cold, however, it is very brittle.

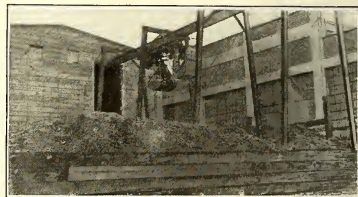
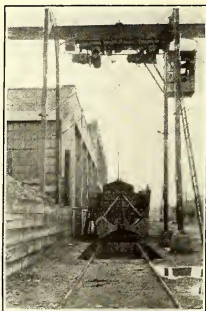
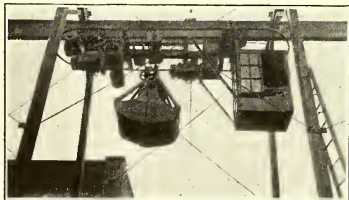
I made an investigation and some tests in this connection by keeping a record of lamp replacements in two cars in the same service. In one of these cars the lamps were kept burning continuously while the car was in motion and in the other the lamps were burned only when necessary. After the same

## Coal Handling for a Shop Power Plant

Detroit United Railway Installs a Monorail Crane to Handle the Coal Supply for a 1000-hp. Boiler Capacity

AT HIGHLAND PARK the Detroit (Mich.) United Railway operates one of the most complete car shop layouts in the country. The furnishing of heat and steam power for these shops requires the use of four boilers each of 250-hp. capacity. These are of B. & W. make and equipped with Detroit stokers. These boilers consume about 12 tons of coal per day and, as at present a storage capacity of only about 9 tons for each battery of two boilers is available in the boiler room, coal has to be continuously handled from an outside pile. This has a capacity of twenty carloads.

For the handling of this coal the company purchased and placed in operation about Dec. 1, a Sprague-General Electric GB-11 monorail crane equipped with a 4-cu.yd. Hayward type-E grab bucket. The crane is capable of lifting a maximum load of 2780 lb. and the height of lift is 25 ft. There are two 6-hp. trolley motors operating at 550 volts direct current and the trolley speed is 350 ft. per minute. The hoisting motors are type M-3, 9 hp. and 6 hp., the former for hoisting using one rope and the latter for holding using two ropes. The speed of hoist is 100 ft. per minute. Both the hoisting control and the trolley are handle-operated and are located inside the cab. The crane operates



AT LEFT, MONORAIL CRANE USED FOR HANDLING COAL AT DETROIT CAR SHOPS. IN CENTER, UNLOADING TRACK AND PIT WHERE COAL IS PICKED UP BY CRANE. AT RIGHT, MONORAIL CRANE RUNWAY AND OUTSIDE COAL STORAGE PILE

length of service it was found that the car which had the lamps burning intermittently developed five cases of broken filaments which resulted in two of the lamp circuits becoming inoperative. In three of the defective lamps the broken filaments had become welded together and so had short-circuited a portion of the remaining sections of filament.

This caused a larger current to flow through the remaining lamps due to the decreased resistance of the circuits and so tended to decrease their life and cause additional trouble and necessitate more lamp replacements. The cars which had the lamps burning continuously did not develop any cases of broken filament. The cost of the additional energy used by the car on which the lamps were burned continuously was 31 per cent less than that of replacing the five lamps with broken filaments. The cost of the extra energy used due to the short-circuiting of the welded filament and the reduction in life of lamps in the circuit where short-circuited filaments were found were not included in the estimate.

on an 18-in. I-beam runway with a trolley on each side, and the closed cage in which the operator rides is attached to the truck frame. The net weight without the bucket is 5000 lb., the bucket weighs 2100 lb. and the total shipping weight is 8500 lb.

At present coal cars are handled direct from the steam railroads to the pit shown in one of the illustrations. If the boiler hoppers are, at the time of unloading, partly empty, they are filled by the crane direct from the car and the remainder of the coal is unloaded onto the storage pile. The coal in the bottom of the car, not reached by the bucket is dumped into the pit from which it is picked up by the crane. The crane enters the building on a runway through double swinging doors, the front and rear ends of the truck being equipped with bumpers which strike the doors on steel plates. The runway extends over the hoppers of both batteries of boilers and dumping is effected without any lowering of the bucket.

At present ashes are handled by hand but an endless

conveyor is now being installed. The ashes will fall from the stokers onto this and they will be conveyed to a pit just inside the doorway through which the crane enters the building. After this installation is completed the crane, when filling the hoppers from the outside storage pile, will pick up a load of ashes on the return trip and deposit them in a car standing over the unloading pit. Thus the two operations will be accomplished with practically no extra horizontal motion and the crane will be given work for a large part of the day.

### Zinc Chloride Versus Creosote for Treating Ties

THE American Wood Preservers' Association met in St. Louis last week and elected the following officers: J. B. Card, president; A. R. Joyce, first vice-president; C. Marshall Taylor, second vice-president; F. J. Angier, secretary-treasurer.

An entire session of the convention was devoted to a discussion of the available supply of chemicals for the preservation of ties and other railroad timbers. Reports from manufacturers of creosote were not at all encouraging as to the present outlook for this material. As a result of the shortage in the creosote oil supply, there has been a notable transition from the use of creosote to zinc chloride in the treatment of ties. While this latter material will not preserve timber as effectively as creosote, nevertheless it increases the life of the ties from two to three times that of the untreated wood.

In this connection it is interesting to note that in the tests of roadbed leakage resistance conducted by the United States Bureau of Standards and described by E. R. Shepard in the *ELECTRIC RAILWAY JOURNAL* of Jan. 25, it was found that ties treated with zinc chloride showed a very low electrical resistance. Also in the 1916 report of the committee on way matters of the A. E. R. E. A. it was stated that the experience of several electric railway companies indicated that zinc chloride increases the conductivity of timber and in many instances has given impetus to the corrosion of spikes and the rail base. This experience was deemed sufficient reason to make the consideration of zinc chloride as a preservative in the electric railway field undesirable.

### Best Way of Stacking Ties

IN DISCUSSING methods of stacking ties at the January meeting of the American Wood Preservers' Association it was stated that the 1 x 9 method of stacking ties in a yard was the best because it allows plenty of air to circulate through the piles, and as this method of piling provides stacks of ten, counting is made very easy whenever that becomes necessary. The 1 x 9 method consists of laying one tie crosswise at the edge of the pile with nine ties on top of this laid lengthwise.

The advantages of the 1 x 9 method over the 2 x 8 method are that with the latter the ties will lie absolutely flat whereas with the former the ties are sloped and thereby give the water a chance to run off and so insure the ties being kept dry and being subject to little danger of decay.

### Impulse Gap Lightning Arrester Is Sensitive to High Frequency Discharges

AT THE 1918 convention of the A. I. E. E., C. T. Allcutt of the Westinghouse Electric & Manufacturing Company discussed a new form of spark gap for lightning arresters to which the term "impulse protective gap" was applied. Since that meeting considerable progress has been made by the company with this device. Its principle is shown in Fig. 1 and the actual set-up of the apparatus is as shown in Fig. 2. The principle of the apparatus is that when two gaps, shunted with unlike impedances, are connected in series one of the gaps will break down more readily than the other when high-frequency impulses are received by them. In practice the equipment includes standard porcelain insulators (two of which are used as condensers), an unbalancing resistor, an auxiliary electrode

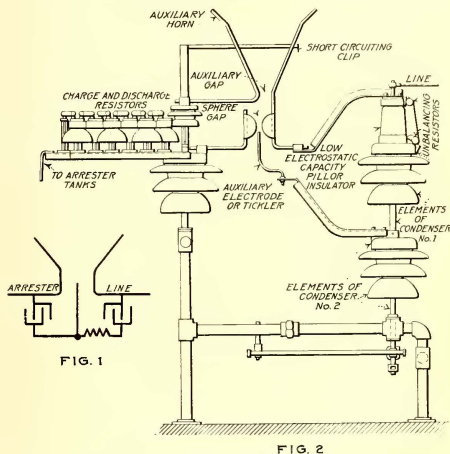


FIG. 1—SIMPLIFIED DIAGRAM OF IMPULSE GAP ARRESTER. FIG. 2—ACTUAL SET-UP OF APPARATUS

or "tickler," a sphere gap, an auxiliary horn gap, a short-circuiting clip, a charge-and-discharge resistor, and a supporting framework. The framework is equipped with feet which can be mounted upon an existing structure.

In action the high frequency discharges start from the auxiliary electrode and have but one-half of the gap to jump. This electrode is so shaped that although the gap is one-half the main gap the breakdown voltage is only about one-fourth as great. One important claim for the new type of arrester is the speed at which the arrester operates due to the shorter time needed to build up the field.

A misprint occurred in one of the formulae published with Norman Litchfield's article on page 287 of the issue of the *ELECTRIC RAILWAY JOURNAL* for Aug. 17, 1918. This formula was for the downward force at the front plate of a truck caused by the turning movement of a couple and should read  $P = 0.2625 (BW/CL) \times 4$ . The figure "4" was omitted previously.

# American Association News

*Committee Activity Is Revived by the Appointment of Thirteen Committees—Program for the Midyear Meeting Is Announced—Company Sections Resume Sessions after a War Lapse*

## American Committees Announced

Three New Committees Chosen for National Relations, Readjustment and Zone Systems

**P**RESIDENT PARDEE of the American Electric Railway Association has announced the appointment of various committees for the coming year. The list includes three new committees—on national relations, on readjustment and on zone systems. The first one will take over the work of the committee on federal relations.

The committee on the award of the A. N. Brady Medal will not be announced until it is decided whether this competition, which is conducted under the auspices of the American Museum of Safety, will be resumed. It was discontinued last year because of the war.

The committee to award the company section medal will be announced later, as will the committee on compensation for carrying United States mail, the convention committee and the transportation committee.

The committees as they now stand consist of the following:

*"Aera" Advisory*—H. C. Donecker, chairman, Newark, N. J.; B. I. Budd, Chicago, Ill.; Thomas Finigan, Chicago, Ill.; F. W. Hild, Denver, Col.; C. C. Peirce, Boston, Mass.; Daniel W. Smith, Detroit, Mich.; T. S. Wheelwright, Richmond, Va.

*Company Membership*—Richard McCulloch, chairman, St. Louis, Mo.; F. R. Coates, Toledo, Ohio; J. E. Gibson, Kansas City, Mo.; J. C. McQuiston, East Pittsburgh, Pa.; C. B. Keyes, New York, N. Y.; A. Pizzini, New York, N. Y.

*Company Sections and Individual Membership*—Martin Schriber, chairman, Newark, N. J.; W. J. Flickinger, New Haven, Conn.; H. Friede, Toledo, Ohio; Prof. H. H. Norris, New York, N. Y.; Charles E. Redfern, Providence, R. I.

*Constitution and By-Laws*—Harlow C. Clark, chairman, New York, N. Y.; R. I. Todd, Indianapolis, Ind.; T. A. Cross, Baltimore, Md.

*Education*—Prof. H. H. Norris, chairman, New York City; Prof. A. M. Buck, New York, N. Y.; Prof. D. D. Ewing, Lafayette, Ind.; Prof. W. L. Robb, Troy N. Y.; Martin Schriber, Newark, N. J.

*Electrolysis*—Calvert Townley, chairman, New York, N. Y.; L. D. H. Gilmour, Newark, N. J.; R. P. Stevens, Youngstown, Ohio; J. E. Woodbridge, San Francisco, Cal.

*Libraries*—L. A. Armistead, chairman, Boston, Mass.; I. A. May, New Haven, Conn.; C. C. Mullen, Pittsburgh, Pa.; R. H. Johnston, Washington, D. C.; C. W. Stocks, Boston, Mass.

*National Relations*—P. H. Gadsden, chairman, Charleston, S. C.; H. G. Bradlee, Boston, Mass.; Arthur

W. Brady, Anderson, Ind.; Britton I. Budd, Chicago, Ill.; L. S. Storrs, New Haven, Conn.; W. V. Hill, Washington, D. C.

*Readjustment*—P. H. Gadsden, chairman, Charleston, S. C.; H. G. Bradlee, Boston, Mass.; H. H. Crowell, Grand Rapids, Mich.; W. A. Draper, Cincinnati, Ohio; C. L. Henry, Indianapolis, Ind.; P. J. Kealy, Kansas City, Mo.; Myles B. Lambert, East Pittsburgh, Pa.; C. C. Peirce, Boston, Mass.

*Social Relations*—J. D. Mortimer, chairman, Milwaukee, Wis.; Henry G. Bradlee, Boston, Mass.; E. W. Rice, Jr., Schenectady, N. Y.

*Subjects*—L. S. Storrs, chairman, New Haven, Conn.; M. R. Boylan, Newark, N. J.; Thomas Finigan, Chicago, Ill.; W. F. Ham, Washington, D. C.; Philip J. Kealy, Kansas City, Mo.; R. E. McDougall, Rochester, N. Y.; James H. McGraw, New York, N. Y.; F. R. Phillips, Pittsburgh, Pa.; R. P. Stevens, Youngstown, Ohio.

*Valuation*—Philip J. Kealy, chairman, Kansas City, Mo.; Charles E. Bailey, New York, N. Y.; W. J. Harvie, Auburn, N. Y.; Martin Schriber, Newark, N. J.; W. H. Sawyer, Columbus, Ohio; J. N. Shannahan, Hampton, Va.; B. E. Tilton, Syracuse, N. Y.

*Zone Systems*—W. H. Sawyer, chairman, Columbus, Ohio; Prof. Thomas Conway, Jr., Philadelphia, Pa.; James F. Hamilton, Rochester, N. Y.; J. H. Hanna, Washington, D. C.; L. H. Palmer, Baltimore, Md.; Prof. A. S. Richey, Worcester, Mass.; R. P. Stevens, Youngstown, Ohio; L. S. Storrs, New Haven, Conn.; C. L. S. Tingley, Philadelphia, Pa.

## Program for Midyear Meeting

**T**HE committees in charge of the program for the midyear meeting of the American Electric Railway Association, to be held in New York on March 14, have held several meetings during the past week. Several acceptances from speakers selected for the technical meetings at 29 West Thirty-ninth Street and the dinner at the Waldorf-Astoria in the evening have been received and the full program will be announced shortly. The subjects committee mentioned above, with L. S. Storrs as chairman, is in charge of the technical sessions. The membership of the dinner committee is C. R. Ellicott, chairman; Thomas W. Casey, F. W. Coen, J. J. Doyle, A. Gaboury, F. H. Gale, L. E. Gould, E. A. Maher, Jr., E. D. Kilburn, C. C. Peirce, A. E. Potter and E. F. Wickwire.

## Enthusiastic Dinner Meeting of Connecticut Section

**A**FTER a lapse of some months the Connecticut Company Section resumed activities on the evening of Jan. 28, when 150 members and guests gathered for dinner at the Lawn Club, in New Haven. During dinner an excellent musical program, furnished by company talent was given, and some singing was done by all. As this was the annual meeting, officers were elected, the following being chosen: For president, W. P. Bristol; for vice-president, W. R. Dunham, jr.; for secretary, W. E. Jones; for treasurer, G. H. Crossen;

for director for three years, C. H. Chapman; for director for two years, J. M. Hamilton; for director for one year, A. C. Colby. The name of W. J. Flickinger was reported as that of the director ex-officio. With the exception of the directors these were re-elections as the nominating committee felt that these were warranted in view of the interruptions to the company section work last year.

President Bristol reviewed the work of the past year giving very brief sketches of the several meetings held. He made a strong plea for co-operation between the section members and the company. The membership committee reported a present enrollment of 256 in spite of the withdrawal of 110, largely on account of the war. I. A. May, comptroller The Connecticut Company, explained how the Aetna Life Insurance Company is co-operating with the railway in financing Liberty Bond subscriptions for employees, and he urged the men not to cancel their subscriptions now that the war is over. S. W. Baldwin, assistant attorney, read for the committee on resolutions memorials to three members who had died during the year. These were passed and the men present stood in impressive silence for a time as a mark of respect to the memory of the deceased members.

The first speaker on the program was John W. Colton, executive assistant. The Connecticut Company, who came to the company a few weeks ago from the city editorship of the Springfield (Mass.) *Union*, to take charge of publicity work. He gave statistics to show the need of co-operation between public and utility and said in substance: "The public is with the railway if the service is good, but not if the service is poor." The condition of the electric railways is, he said further, a large economic and civic problem which must be solved in a large way. As an example of what carmen can do to impress the public with the value of railway service he cited a case on one of the company's lines in which a conductor was missed from his accustomed place by the passengers. Inquiry developed that he had been attacked by influenza, and the passengers made up a purse of several hundred dollars to cover his extraordinary expenses.

The final speaker was Capt. L. J. Maloney, who gave a thrilling account of his own experiences on the French front. He related many details of incidents which do not get into addresses usually, and his talk was full of information as well as inspiration. He paid tribute to several men from the Connecticut Company territory who had distinguished themselves by special valor or ingenuity.

### Vaudeville Program at Toledo

THREE HUNDRED AND SIXTY members and guests attended the meeting of the Toledo joint company section held on Jan. 29. The program was one of entertainment comprising selections by the joint section orchestra, a sleight-of-hand performance by a conductor in the company's employ, æsthetic dancing and two boxing bouts.

A membership campaign was inaugurated at the meeting, the present members being divided into two competitive groups. The winning side will be entertained by the other in some manner still to be deter-

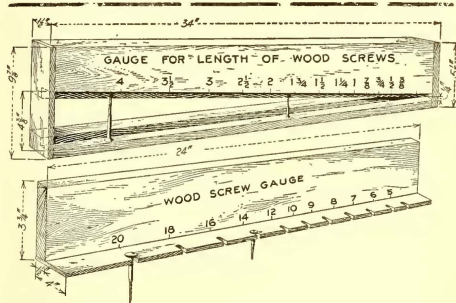
mined. The monthly dance of the section, held on Jan. 15, was attended by 186 persons.

### Delegate on A. I. E. E. Conference Committee

J. H. Libbey, assistant electrical engineer Bay State Street Railway, has been appointed to represent the Engineering Association at meetings of delegates of interested associations which may be called by the A. I. E. E. to consider revision of the standard specifications for the stranding of cables and thickness of insulation.

### Handy Gages for Sorting Wood Screws

IN THE SHOPS of the New York State Railways, Syracuse Lines, the gages shown in the accompanying sketches are used in sorting wood screws for length and gage number. The devices are made of wood and are intended for wall mounting.



GAGES FOR USE IN SORTING WOOD SCREWS

The advantage of the tapered gage for length is that screws of nominally the same length vary quite a little in actual length. In sorting it is close enough to rate a screw as of the length corresponding to the nearest number on the gage.

### Tool Steels Made in Electric Furnaces

THE Carnegie Steel Company is now making five grades of tool steel in its electric furnaces at the Duquesne Steel Works. These contain different proportions of carbon to meet different cutting requirements. The new steels are described in a pamphlet entitled "Tool Steel," which is intended for the actual tool steel user. It contains practical information without discussion of theories of heat treatment. Technical terms which are unfamiliar to many users have been omitted and in place of these reference is made to "line of hardening and minimum grain size" which are the essential points in the heat treatment of steel. Illustrations of full-sized test pieces are shown, together with a chart of heat colors and their corresponding heat-treatment temperatures. Names of colors have been selected to conform to the most general uses and are checked by indications of temperature in Centigrade and Fahrenheit degree. A chart of temper colors is reproduced by color photography from test pieces heat treated to the temperature shown. This affords a means for direct comparison by the blacksmith in the shop.

## LETTER TO THE EDITORS

### Commutation Tickets Would Help in Several Ways

NEW YORK CITY, Jan. 28, 1919.

To the Editors:

In connection with the discussion on fare systems, I would like to ask: "Why not compromise and use the zone system for cash fares but sell commutation tickets on the straight fare basis?" The monthly commutation tickets might be sold with two rides per day for the working people, at, say, 5 cents a ride, while to those who rode to the city outskirts and paid cash a considerably higher rate would be charged. Such a plan would eliminate the objection that zoning tends to develop the tenement district. On the other hand, the occasional, long-distance rider would be charged for the "readiness to serve" in a territory where service costs more because the travel is less. Under this plan the occasional rider buys at retail and pays accordingly a proper share of the company's overhead charges.

In many cases the electric railways cannot secure urgently needed increased revenue by increasing the fares, even if such fare increases are granted by the utility commission. If fares are advanced so far that many people will walk, the net increase in revenue is *nil*. At least such a condition would result in those cities where the climate permits all-year walking and where there is a well built-up apartment house and residence district not very far distant from the business section.

The 5-cent commutation rate would also take care of the private owners of automobiles. These automobiles transport passengers who expect to patronize the electric cars only when the weather is bad or when they are not invited to ride free. These "rainy day" patrons of the railway expect something for nothing. They expect the electric cars to pass their doors at certain times every morning but they do not expect to pay anything for this readiness to serve. Under the present system of fares, the occasional rider, such as the automobile owner, pays no more for a ride on the electric cars than does the passenger who rides regularly. The result is that the railway, being unable to forecast the weather, has to provide every day a seating capacity sufficient for maximum riding days, and this is not fair.

When service is ordered from the telephone, electric light or water companies, a deposit is first required which guarantees that the customer will pay a stipulated minimum amount each month, whether the service is used or not. The electric railway is as truly a public utility as are those mentioned, and there is no valid reason why it cannot collect a readiness to serve charge if the others are entitled to do so. This same rule of a daily commutation fare should apply to interurban service as well.

The sixty-ride commutation ticket suggested should not be good for more than thirty days; otherwise, those who ride in privately-owned automobiles may extend the use of their tickets over a longer period, say forty days, while the transportation company has provided

service to take care of the patrons within the thirty days. The fare charged per ride by the commutation ticket need not be less than that charged in cash for a single short ride, but it should be considerably less than the cash charge for a long ride for the reasons already set forth.

OBSERVER.

### Shop Practices of the Glasgow Corporation Tramways

AS THE Glasgow Corporation Tramways do a considerable amount of metal manufacture, American makers and users of the same classes of equipment may be interested in the proportions of the compositions which have been found satisfactory for the rather severe service and weather conditions of that city.

The standard trolley wheel is only 4 in. in diameter with  $\frac{3}{4}$ -in. hub and 2 $\frac{3}{8}$ -in. groove, although it is used on a double-deck car weighing 24,260 lb. exclusive of sixty-two possible seated passengers, six standees and the crew. This wheel is composed of 87.75 per cent copper, 10.5 per cent tin, 1.5 per cent zinc, 0.125 per cent phosphorus and 0.125 per cent lead. Its life ranges from 12,400 to 15,600 miles, which is considerably better than the average in this country. Only two 30-hp. or two 35 to 40-hp. motors are used per car. The base tension is 16 lb.

All trolley wheels are fitted with oil-less graphite bushings which may have a life up to 9000 miles. Since this is less than the mileage of the trolley wheels, it is usually necessary to use two bushings per wheel. At the main shops, the bushings are inserted with a tinsmith's press which exerts the necessary pressure over a brass cap which protects the bushing. At the inspection depots, a hand vise serves the same purpose. The frequent American plan of inserting trolley bushings by pneumatic pressure is not possible as no compressed air is available either from air brakes on the cars or air compressors in the shops.

The harps (heads) are composed of 87 per cent copper, 8 per cent tin and 5 per cent zinc; the overhead fittings, including ears and like parts, 88 per cent copper, 10 per cent tin, 2 per cent zinc; the miscellaneous brass castings, as for car fittings, 66 per cent copper. In all cases, the bulk of the copper comes from the melting of discarded trolley wire.

### Precautions for Preventing Fires in Carhouses

At a meeting of the Western Association of Electrical Inspectors held in Chicago on Jan. 28, 29 and 30, recommendations were made to the National Electric Code Committee to insure protection against fires occurring in carhouses. These recommendations were that all trolley wires inside of buildings be securely supported on insulating hangers attached to a wood troughing; that feed wires supplying current to the trolley wires have a carrying capacity sufficient for the longest track in the carhouses; that power for light, heat and stationary motors be taken from a commercial circuit where possible; that a line breaker be installed in each track trolley wire entering a carhouse, and that each track trolley wire be fed independently and be controlled by approved cutouts.



# News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

## Pushing Ahead

**Detroit's New Mayor Soaping the Ways for an Early Launching of Municipal Ownership**

Street railway matters keep well to the front in the program of the new city administration of Detroit, Mich. It will be recalled that the new Mayor, James Couzens, devoted a considerable part of his inaugural address to the railway matter, advocating a purchase proposal. Since then Abner E. Larned has been appointed by the Mayor to the Street Railway Commission. This was followed by his election as president of the commission. Edward T. Fitzgerald has been named secretary. The commission as now constituted consists of Francis McMath, of the Canadian Bridge Company, and Col. S. D. Waldron, vice-president of the Cadillac Motor Car Company.

As Mr. Couzens views the matter it is the city's business to end as soon as possible "twenty-five years of fighting and brawling with the street railway." He says that with all due respect to engineers and their theories and opinions, "plain business methods will quickly tell you a fair valuation for the property."

In furtherance of his plans Mr. Couzens has obtained the aid of M. M. O'Shaughnessy, city engineer of San Francisco, Cal., and consultant in connection with the building of the municipal lines there, to advise him about Detroit. The Mayor knows that speed is essential. He wants the proposition of purchase to go before the voters at the election on April 5. If this is to be made possible the preliminaries must all be arranged with the railway by March 17, as the Common Council must act at least twenty days before election on any issue that is to go before the voters. In addressing the Street Railway Commission recently the Mayor said:

I am informed, indirectly but from a reliable source, that the company will not set a price on its property, feeling that to do so might embarrass the company in case the city should start condemnation proceedings. I suggest that this commission take these appraisals, study them all; make up its mind where the differences in valuation are, and what are the fairest valuations and act on that. I am absolutely committed to the idea that the city should pay the railway nothing whatever for franchises, and nothing whatever as a "going concern." I do not know what the company's attitude on that will be, but I believe you men will agree with me when you go into the matter thoroughly.

The Mayor outlined recently the history of the various appraisals of the railway properties, stating that the Bemis appraisal set a figure of about \$73,913 per mile; the Cooley appraisal fixed the value at about \$102,000 a mile, and the appraisal of Barclay Parsons

& Klapp was about \$100,000 a mile, made on a basis of 270 miles of railway. There are now 285 miles, the Mayor explained, but it would be possible to carry out the Barclay Parsons & Klapp appraisal for 270 miles of railway, and bring it up to date, by adding a per mile percentage of valuation. The Wyandotte, Harper and Grosse Pointe lines were not included in the appraisals.

The Mayor's reference to the past has served to carry Detroiters of the older generation back to the days of Governor Pingree and Tom L. Johnson about 1899 at which time with the city on the eve of embarking on municipal ownership, the negotiations were broken off, and the ordinance permitted to die. Mr. Johnson then sold out and sought other worlds to conquer.

## Some Fine Points Involved

**Dispute Over Rights of Lessor to Electricity Leased Line Under a General Electrification Plan**

The Legislature of the State of Washington has before it the matter of terms whereby the Chicago, Milwaukee & St. Paul Railroad will be permitted to electrify about 25 miles of line belonging to the Columbia & Puget Sound Railway, which is under a ninety-nine year lease for joint use by the Milwaukee. In the first hearing before the Senate judiciary committee, the Puget Sound won a postponement of the hearing until Jan. 30 on a condemnation bill the Milwaukee is urging.

The Milwaukee came into Seattle over the Columbia & Puget Sound line by a trackage agreement that gives the Milwaukee running rights over the Puget Sound section, between Maple Valley and Black River Junction. The Milwaukee subsequently contended it had a right to electrify this portion of the system to make it fit into the company's plan for operating by electricity west of the Rockies. The question was finally submitted to arbitration, with William H. Taft as the final arbiter. He held that the Milwaukee did not have the right to electrify the line, but added as comment that it might acquire such rights by condemnation.

The Milwaukee officials told the Senate committee that it finally decided that it could not condemn the line, and the two roads still failed to reach an agreement. The Columbia & Puget Sound Railway said that it offered to submit the question of compensation to arbitration, and that this offer was refused. It developed at the hearing that other steam roads might be affected by the legislation, and it was decided to hold a general hearing.

## Overrun With Strikes

**London Tubes and Suburban Lines Suspend with Grave Consequences to Metropolitan Public**

Newspaper dispatches indicate that practically all Great Britain is at grips with labor. There are strikes and rumors of strikes. Under the stress of war necessities, labor had things its own way. At the close of the year signs pointed to the employers being far more at the mercy of their work people than ever they were before the war was declared.

### CRISES FORESEEN

As the London correspondent pointed out in his letter in this paper for Feb. 1, a problem of enormous difficulty was how far the expansion of industry was compatible with steadily increasing wages and large reductions in number of hours worked a day or week. In the light of events now taking place the elastic limit of endurance seems at last to have been reached.

So far as the city transportation industry is concerned the worst stoppage of traffic is reported from London. The subway strike there began on Feb. 3, when Londoners found the entrances to the principal subway stations closed to them, owing to the midnight decision of the employees not to move trains unless a half-hour luncheon interval were allowed in their new eight-hour day.

### BUSES AND STREET CARS GOING

Six tubes are reported to be affected. They are the Central London tube, which carries a heavy traffic west and east and brings many of the city workers to their businesses; the central tube artery north and south; the City & South London tube, which connects with the chief railway stations and Piccadilly; the Brompton semicircular system, which carries many thousands of travelers daily, and the Highgate and Hampstead subways, which carry traffic between the northern and north-western suburbs and the West End district of London.

The electric system of the London, Brighton & South Coast Railway, which serves many of the important suburbs, also stopped partly on Feb. 3, and other railways with similar services were threatened with stoppage.

Buses and the street cars still were running on the afternoon of Feb. 3, but on Feb. 4 almost every bus carried a tube striker, and these tube employees were urging the girl conductresses on the buses to join the strikers.

The management of the London Underground Railways in a statement on Feb. 3 said that although the men are demanding a thirty-minute interval for meal time within the eight-hour day, the agreement made when the eight-hour day was granted provided that the eight hours should be exclusive of meal time, but that a special committee should meet on Feb. 12 to deal with any special points that might arise. The Board of Trade, of which Sir Albert

Stanley, formerly head of the underground system, is chairman, issued a similar statement.

As this paper goes to press advices from London indicate a satisfactory settlement of the trouble in London. This settlement is understood to include the tubes and all the other London railway systems. Pending consideration of general conditions, the underground men will work eight hours, exclusive of mealtime.

## Another Kansas City Strike Chapter

### With Conditions Again Practically Normal on Kansas City Railways War Board Orders Reinstatements

An award by the War Labor Board on Jan. 31 orders the Kansas City (Mo.) Railways to restore to duty at once its striking employees under conditions prevailing before the strike, and to prosecute diligently its application for permission to increase fares, upon which increased wages previously awarded by the board were contingent. The board declared:

It is of the utmost importance that good faith on both sides in dealings between labor and capital should be preserved. We do not hesitate, therefore, to condemn the action of the men in striking as they did, but we cannot be blind to the provoking circumstances which led them to this wrong. The attitude of the company seems to have been that it was content that the men had made the mistake of striking because it would enable them to defeat the union and to avoid the burden of increased wages.

It will be observed that the submission was signed at a time when there was no prospect of ending the war. The men were induced to return to the employ of the company with the prospect of increased wages during the period of the war. The attitude of the company at the time of its action and the interest of the company seem to have changed after the armistice came. The company has announced its purpose to disregard the action of the board taken upon this application on the ground that the board has no further jurisdiction.

It can and should make no difference to the board whether the company may successfully avoid performance of the award, because we have complete jurisdiction over the process within our control. It is our duty to proceed as if we were dealing with parties who would comply with a lawful award. Upon that hypothesis we find that the company by its conduct has prevented the performance of the conditions upon which the award was granted. The company's conduct has not been in good faith, and that, therefore, the condition is to be treated as if performed and the award is deemed effective as from Jan. 6, 1919, when the men offered to return to work, in accordance with our telegraphic order.

When its men walked out six weeks ago the company was left seemingly helpless. Of the 3000 men employed, 2800 left the service. Not 100 were left in the train service. Fifteen men remained in the carhouses. Only half a dozen stuck to their jobs in the shops. Only 10 per cent remained in the power house. Notwithstanding this handicap, the power for the industrial plants never ceased for an hour. Within two days railway service was resumed. Six weeks later train service was normal and shops were running at their full capacity. The track force, which quit to a man, is now doing its regular work. On Feb. 1 there were 2000 men in the train service and the shops had caught up with their work.

In considering the order of the War Board that the railway take back its

former employees, the company replied:

We do not consider that there is a strike. Many of our employees "ceased work" and we were obliged to put on new men whom we have been and are still training in their duties. They are competent, are satisfactory and we have no need for more men at present. This company will employ any of its ex-employees whose records are clear and for whom a vacancy exists. We will not discharge a single one of the present employees whose services are satisfactory, in order to make room for any of our ex-employees. But the latter will be given preference for re-employment.

In reply to the order of the War Board that the men who left the company's employ in December, be returned to work P. J. Kealy, president, issued the following under date of Feb. 3, the day such former employees were to be restored:

The answer of the Kansas City Railways to the amended order of the War Labor Board is this:

The company does not have the money to pay the increased wages recommended, it cannot obtain it, and therefore will not promise to pay it.

The company cannot, without breach of contract, confidence and good faith, discharge the men employed to take the places of the striking employees, hence, cannot and will not do so.

The Amalgamated Workers met on Feb. 2 and voted to return to work and demanded that they be reinstated. The announcement quoted previously is President Kealy's ultimatum. Of the 2800 who "ceased to work" in December, 250 returned in the meantime and are permanently employed.

The four men who were arrested and confessed to having placed bombs under the cars are still in jail. They were unable to furnish bonds.

### Gone, but Not Forgotten

A few years ago, says *Municipal Reference Library Notes*, published by the New York Public Library, the more important editorial offices of this country received regularly, without charge, a cleverly written little publication entitled *Concerning Municipal Ownership*. This magazine was designed for editorial use and the material was so well presented that much of it found its way into the pages of various periodicals. Needless to say, the articles, humorous stories and cartoons all preached the failure and inefficiency of municipal undertakings.

*Concerning Municipal Ownership* ceased to appear about three years

ago and shortly thereafter was announced the formation of the Public Ownership League of America which was put forward as "a non-partisan, educational movement for the advancement of the public ownership and democratic control of public utilities and natural resources" and whose object was stated as being "to secure the efficient operation of public utilities already publicly owned; just and reasonable conditions for all public employees, and the public ownership of additional public utilities as far and as fast as it can be made practical."

The league's offices are at 1439 Unity Building, Chicago. Albert M. Todd, Kalamazoo, Mich., is president, and Carl D. Thompson is secretary.

The publication of a *News Letter* has recently been undertaken and the first issue contains many items about the progress of the municipal ownership movement. Other bulletins are in preparation.

### Work, Not Talk, His Motto

Frederick P. Royce, the new general manager of the Brooklyn (N. Y.) Rapid Transit Company, on assuming the duties of his new office made the following statement:

There is little that I can say at present that would be of interest to the patrons of the properties of which Judge Garrison has appointed me general manager. I have made only a most casual inspection of parts of the lines and know little about the power plant, the operating department and the equipment. When I know more I may have something to say, but at best I shall be a poor talker. I prefer to let my work speak for me.

"This much, however, I can say: I have been identified with the management of public utilities, including transit companies, for many years, and I have always found that those companies which served their patrons best paid their stockholders most. And so I have always insisted that properties with whose management I had to do should give the best service possible to the public. What "the best service possible" on these lines means, I cannot say now, but it won't take me a great deal of time to find out. When I do, I hope to be able to help the receiver in giving that sort of service to the patrons of the B. R. T.

### Metropolitan District Jubilee

The Metropolitan District Railway, London, England, has just completed its jubilee, the first section having been opened in October, 1863. Until the year 1905 its name was anathema owing to the foul atmosphere in the tunnels due to the steam locomotives which were employed. Since the advent of electric traction matters have been altogether different, and the line enjoys an overwhelming popularity. Running from the western suburbs through the heart of the city to the east end, and connecting with other railways, it does a huge business and the trains make almost a procession during the rush hours. Unfortunately the high capitalization prevents any dividend being paid on the ordinary shares. The original cost of construction and payments for land were enormous. One observer expresses the opinion that perhaps some day there will be a reconstruction and readjustment scheme under which some of the capital will be written off.

## Making Jobs by Ordinance

Newspaper Defends One-Man Car in Editorial Which Shows Motives of Opposition

In California a bill has been introduced in the Legislature to prevent the use of one-man cars. In Spokane the local union has decreed their death. Muscatine has enacted an ordinance enforcing the use of two men on a car. More recently in Hartford, Conn., have some interests become frightened by thoughts of the return to the tintinnabulation of the bells of horse-car days. The opposition seems to be obsessed with the idea that the new cars are a labor-saving device and nothing more, introduced for war-time use, and that the war being over, the cars should now go. That the labor-saving feature is only one of many points of advantage inherent in the one-man design needs no reiteration here. This fact has not been entirely lost sight of outside the industry, either, as shown by the following extract from an editorial "Making Jobs by Ordinance" in the Marshalltown (Iowa) *Times-Republican*:

Muscatine has an ordinance enforcing two men on street cars. A street car cannot run in Muscatine without two men to handle it, under the ordinance which has just been upheld by a court and which will be carried to the Supreme Court for decision. The Council of Muscatine did the community a wrong when it passed such an ordinance. Marshalltown has experience with the one-man car and approves it thoroughly. It is quite as safe as the two-man plan as the records of accidents will show by comparison. The ordinance is excellent. The men themselves like it. There is no good reason to be given for two men cars in Marshalltown. The city manager wants an unnecessary job. And Marshalltown is a larger and in all modesty may be said to be a better city than Muscatine.

The one-man car may be an eyesore to those who would make two jobs grow where one is entirely sufficient, but it is not to the mass of workmen and employed persons. For the one-man car permits line extensions and the operation of more cars to reach out into the outlying districts to carry more employed persons at a possible profit. Where a two-man car would lose money a one-man car may operate profitably.

Extensions are the poor man's opportunity. It gives him a chance at cheaper lots that will soon be "inside property." "Inside property" means only one thing, that it is easy of access to employment or business. The street car line built up in addition to the city. Growth is dependent upon transportation and transportation is dependent upon the possibility of transporting passengers with a profit or at least without loss. Good law is presumed to be good common sense. It is neither good law nor good sense to attempt to enforce upon a public utility the employment of unnecessary and inadvisable employees. So it is fair to presume that the Supreme Court will take a different view of the Muscatine situation than that taken by the court that has passed upon the ordinance.

## A Vicious Legal Cycle

The investigation of the methods of certain attorneys in representing men charged with crimes in Cleveland, Ohio, brought out an interesting story from John J. Stanley, president of the Cleveland Railway, as to how a crook was made a street railway checker on the recommendation of an attorney. This attorney afterward defended the man, who was charged with pocket picking and signed his bond of \$500. Mr. Stanley testified before a committee of the Bar Association.

It seems this man made it his duty to clear the way for gangs of pickpockets to work the cars and several honest conductors lost their places on complaints made by him before the management learned his character. Where a conductor sought to protect his passengers from the thieves, false charges were brought against him and he was called before the management.

Under this system the criminals became very bold and finally took to picking the pockets of the conductors. Company officials became suspicious, but the culprit learned of the fact in some way and disappeared. He was later arrested for operating on a car and an indictment was found against him, but he had never been brought to trial.

## Canada Plans Construction

Sir Adam Beck of the Ontario Hydro-Electric Commission of Canada, announces that work on the proposed hydro-radial electric railway connecting Fort Erie, Ont., with Niagara Falls and Port Colborne will be started within the next few months as one of the Canadian government's post-war plans.

The route was surveyed before the war, when the municipalities passed by-laws, bonding themselves for the amount of the expenditure of the proposed line.

Another project which will be undertaken soon by the Dominion government is the construction of an electric railway between Fort Erie and Hamilton, Ont. Fort Erie is across the Niagara River from Buffalo. Plans are being made by Canadian and American interests for the construction of a vehicular bridge across the river at this point and it is proposed to run the Canadian electric lines into Buffalo via this structure.

The road between Hamilton and Fort Erie is one link in the proposed line connecting Toronto and Buffalo. The Niagara, St. Catharines & Toronto Railway line from St. Catharines to Niagara Falls, Ont., and St. Catharines to Welland and from Port Colborne to St. Catharines are parts of the Canadian Northern system taken over by the Dominion government.

By taking over the Burlington radial, the Hydro-Electric Commission is well started on its line between Toronto and Hamilton. From Hamilton to Beamsville, the Hamilton, Beamsville & Grimsby electric line runs and it is only necessary to connect up the 12.4 miles between St. Catharines and Beamsville to have the completed line between Hamilton and Niagara Falls, Ont.

## Bill to Aid Connecticut Company

State aid to the extent of \$2,000,000 to the Connecticut Company, which operates most of the electric railways in the State, is proposed in a bill offered in the General Assembly. The Public Utilities Commission would first give hearings to determine the need and decide on the payment of sums as required.

## Labor Case Concluded

Only Presentation of Briefs Remains in Case of Washington Company Before War Labor Board

The Washington Railway & Electric Company, Washington, D. C., and its employees completed the presentation of their cases as to the few remaining issues between them at the hearing before the examiners of the National War Labor Board on Jan. 31. The attorneys will present briefs instead of making oral argument.

Former President Taft, joint chairman of the board with Basil M. Manly, expects to be away from Washington for about two weeks, and the examiners advised the parties that the award of the board would not be made earlier than Feb. 20. Meanwhile the changes in working conditions which were agreed to are to become effective at once.

The company and the men agreed that as nearly as possible, 70 per cent of the men should have straight runs, and not more than 30 per cent swing runs. The company is to welcome the co-operation of the men in framing schedules. Extra men reporting for extra work are to receive half pay until actually put to work. Motormen operating snowplows are to receive 60 cents an hour and conductors 55 cents.

Of the points left at issue the most important are: Whether the conductors are to be paid for the twenty or more minutes they spend after coming in from their runs in making out their reports and turning in their receipts; and, whether motormen operating hand-brake cars are to receive 5 cents an hour extra.

## Ottawa Would Sell to City

The Ottawa (Ont.) Electric Railway has made an offer to sell to the city at a price of, in round figures, \$6,500,000, and has given an option to May 1 at this price. The sale figure covers all the holdings of the company, including Britannic Park and the Rockcliffe right-of-way. The matter has been under negotiation with the Board of Control for some time and took such shape that it was decided on Jan. 30 to make an announcement.

A special meeting of the City Council has been called to authorize the board to "engage such engineering, financial or legal assistance as may be necessary to obtain a full report on the proposition submitted, obtaining the necessary legislation in connection with the purchase of the road and doing other things arising in connection with the sale."

In view of the overwhelming majority in favor of the purchase of the railway and its operation by a commission when the questions were submitted to the electors, it is expected that the City Council will approve of the recommendations.

The company's franchise expires in five years.

## Canada Takes Electric Line

The Dominion government, through D. B. Hanna, president of the Canadian National Railways, has purchased the Toronto Suburban Railway system from Sir William MacKenzie, of MacKenzie & Mann, and the Royce estate. The Davenport, Crescent and Lambton lines of Toronto and the Guelph, Ont., radial are included in the deal.

President Hanna announces that the Toronto Eastern, now under construction through Bowmanville, Whitty and Oshawa, will be completed and operated for the present under the existing management. The government is willing to sell the lines within the city to the municipality, and it seems likely that the city will make the purchase in order to extend the small municipal system which has been in operation for several years.

The government took over the line on the basis of inventory cost, which is said to be substantially less than replacement cost under present conditions. It is stated that the Guelph line will be connected with a new road which will be built between Toronto and Hamilton if the federal government does not take over the Grand Trunk system.

## What Patrons Should Do

In support of its application for a 6-cent fare the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has issued to its patrons a thirty-page pamphlet describing the various aspects of the transportation problem. For some years, it is said, transportation has been furnished at less than cost, and the public and the investor have both suffered. The present established agencies have failed so far to solve the difficulty, and communities should adopt one of the following plans:

1. Take more thoughtful interest in the local and State agencies set up to control and regulate service and rates and give them intelligent, helpful advice.
2. Appoint public directors to have absolute charge of service, rates and operation and guarantee of a fair return under these conditions on the money the private individual has invested in the service of the public.
3. Or purchase and assume as a public obligation the ownership and operation of electric railway lines.

The company's application for a fare increase was filed on Jan. 20, but the appeal to the public was made before this date. On Jan. 16 the company sent to every city official in its territory a personal letter with a copy of the pamphlet, stating also that every city attorney would receive a copy of the forthcoming petition to the commission and all the exhibits to be used.

On Jan. 18 the company issued a full-page newspaper advertisement asking the consideration of all patrons, and it distributed to them 30,000 copies of the pamphlet. This direct presentation of the company's case to the public was made because the Fort Wayne company believes that the benefits from a fare increase are minimized unless the good-will of the patrons is retained.

The company's petition to the commission asks for an increase in street railway fares from 5 cents to 6 cents in Fort Wayne, Logansport, Lafayette, Wabash and Peru, and an increase in interurban rates from 2½ cents to 2½ cents a mile. For the last two years the company has defaulted in the payment on its \$10,815,000 of 5 per cent mortgage bonds, and it has never paid a dividend on either common or preferred stock.

## News Notes

**Against One-Man Cars.**—A bill has been introduced in the Legislature of California by labor organizations to prohibit the use of one-man cars.

**Municipal Ownership Move in Hartford.**—The Aldermen of Hartford, Conn., on Jan. 27 voted to ask permission from the Legislature to purchase the Hartford lines of the Connecticut Company.

**Attack Spokane One-Man Cars.**—The labor unions of Spokane, Wash., are demanding that the Washington Water Power Company and the Spokane & Inland Empire Railroad take off the one-man cars, contending that they are unsafe and that the service which is rendered by them is inadequate.

**Wants Opinion from Attorney-General.**—Senator Perrin of Norfolk, Mass., has presented in the State Senate an order requesting an opinion from the Attorney-General on the constitutional-ity of last year's Boston Elevated Railway service-at-cost bill. The order has since been adopted in the Senate upon recommendation of the committee on rules.

**Overtime Award Announced.**—The Wilmington & Philadelphia Traction Company, Wilmington, Del., has been instructed by the War Labor Board to pay time and one-quarter for hours exceeding ten in a day and to pay men working on snowplows and street sweepers time and a half after ten hours.

**Milwaukee Against One-Man Cars.**—Mayor D. W. Hoan, of Milwaukee, Wis., has signed the ordinance passed by the Common Council providing that the Milwaukee Electric Railway & Light Company must place two men on all its cars. The ordinance, if enforced, will automatically abolish the one-man stub service in force on a number of outlying lines.

**Wage Increase on Ohio Electric Railway.**—Reports from Newark, Ohio, are to the effect that the Federal War Labor Board has increased the wages of platform men on the Ohio Electric Railway. On the Newark city line the maximum will be 42 cents an hour, instead of 39 cents. Interurban men

will receive a maximum of 45 cents, instead of 35 cents.

**Would Require All-Steel Cars.**—Steel cars for all transit lines in Brooklyn and the other boroughs of Greater New York are provided for in a bill which Senator Bernard Downing and Assemblyman Dickstein offered on Feb. 5. The bill applies to all surface, elevated and subway lines and the requirement must be effective one year after the law is signed.

**New Milwaukee Wages Continue.**—The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has announced that it will continue the payment of the present increased wage scale until March 15. The danger of a strike on Feb. 1 was thereby avoided. The issues involved in this case were reviewed in the ELECTRIC RAILWAY JOURNAL for Feb. 1, page 247.

**Toronto Men Accept Award.**—When reminded by union leaders that the wage agreement expires in June next, employees of the Toronto (Ont.) Railway concluded to accept the award of a board of conciliation under which they are granted a war bonus of 2 cents to 2½ cents an hour. The company was willing to accept the award, but the men at first were in favor of appealing.

**Notice of Termination of Employment.**—A bill has been introduced in the Legislature of Iowa making it mandatory for public service corporations to give employees at least ten days' notice before discharging them, or giving them written notice setting forth the reasons for the discharge. In like manner the employees are required to give ten days notice before leaving the service of their employers.

**Railway Wants Bus Franchise Reviewed.**—A writ of certiorari to review the action of the City Commission of Newark, N. J., in granting a fifteen-year franchise to the General Omnibus Company of New Jersey has been granted by Chief Justice Gummere in the Supreme Court upon the application of the Public Service Railway. The contention of the railway is that the franchise ordinance was adopted by the commission with an insufficient number of votes. The issuance of the writ will act as a stay against operation of the buses.

**Extension of Franchise in Lakewood.**—The village of Lakewood, suburb of Cleveland, Ohio, has suggested to J. J. Stanley, president of the Cleveland Railway, terms for a ten-year extension of the franchise in that municipality. Continuance of the 3-cent fare in Lakewood, maintenance of the 5-cent fare between points within Cleveland and Lakewood, with provision that the charge shall never be less than that in Cleveland, and laying tracks in the center of Clifton Boulevard, are among the terms mentioned. If the franchise is not renewed by May 1, 1919, the suburb will lose the 3-cent rates within its boundaries, and the company may charge 5 cents.

**New River Tunnel Ready on April 1.**—The Public Service Commission for the First District of New York is making plans for the opening of the new Clark Street tunnel line to Brooklyn about April 1. This line forms the connection between the West Side subway in Manhattan and the Interborough lines in Brooklyn. It is a two-track subway connecting with the West Side line at Chambers Street, and extending through Park Place and William Street in Manhattan to the new Interborough Rapid Transit Company East River tunnel to Brooklyn, and on the Brooklyn side through Clark and Fulton Streets to a connection with the existing line at the Borough Hall station. At present the line is in operation as far as Wall and William Streets, Manhattan.

**Commission Work Can Now Proceed.**—The Board of Estimate of New York City has appropriated \$315,564 to cover the expenses of the Public Service Commission for the First District for February and March. This is at the yearly rate of \$1,952,431, and the administration and rapid transit part of the appropriation was in accordance with the schedules presented by the commission. The commission, however, did not get the \$14,246 it wanted for a new bureau to audit the operating accounts of the Brooklyn Rapid Transit Company and the Interborough Rapid Transit Company under the dual contracts. The commission wrote to the Governor recently complaining of the board's refusal to grant appropriations for rapid transit work.

**Severe Flood Damage.**—The heavy downpour of rain in the Puget Sound country during the week ended Jan. 29 caused thousands of dollars of damage to the electric interurban lines, railway systems, and county structures. In many places tracks were under several feet of water, bridges were washed out, and communication entirely cut off. All rail communication between Seattle and Tacoma was severed by 4 and 5 ft. of water submerging the interurban tracks near Tacoma Junction. The main line tracks between Seattle and the East were kept open, and troubles with slides in the mountains were slight. Highway traffic was completely cut off in many places by back wash cutting into the gravel approaches of bridge structures.

**New Brooklyn Accident Arbitrator.**—Henry W. Taft, brother of ex-President Taft, had been designated to succeed Lindley M. Garrison as the representative of the Brooklyn (N. Y.) Rapid Transit Company on the arbitration commission appointed to arbitrate the dispute between the city and the company over the payment of damage claims arising out of the Brighton line wreck on Nov. 1. The dual subway system contract provides that in the case of a disagreement in regard to items of expenditure, etc., the same may be settled by arbitration, one disinterested arbitrator to be appointed by each of the parties and one by the

Chief Judge of the Court of Appeals. Since his appointment to the arbitration commission by the company Mr. Garrison has been made receiver for the company.

**New Wage Demand in Des Moines.**—Employees of the Des Moines (Iowa) City Railway have asked the company for a very material wage increase in a new scale submitted during the week ended Feb. 1. Increases running from 14 to 16 and 18 cents an hour for men of three months', nine months' and one year's service are demanded by the men. Emil G. Schmidt, president of the company, has told representatives of the men that their demands are matters for the United States Court and the receivers of the railway, rather than for the company. A material increase was granted the men within the past few months. Other demands made by the employees are: better heated cars, an eight-hour day and rearrangement of the schedules to allow a four-minute wait at the end of each run.

**Compromise Proposed on Commission Legislation.**—After the hearing at Albany, N. Y., on Feb. 5 on the public service bills a compromise measure framed to meet Republican objections is being considered. This would provide for a three-man commission in New York City, two commissioners to exercise quasi judicial and regulatory functions and the third to be known as commissioner of rapid transit construction. The bill would provide for practically complete separation of construction and regulation of rapid transit operations. In this connection it was reported on Feb. 5 that Governor Smith had sent a cable message to William Barclay Parsons, at present a major-general with the American Expeditionary Forces in France, asking him to undertake the task of completing the unfinished portions of New York City's dual subway system.

**Joint Operation in New San Francisco.**—The development of the residence district beyond the recently completed Twin Peaks Tunnel in San Francisco has called for additional transportation facilities, and the Municipal Railway has extended its system accordingly. About a mile of new double track is being built and arrangements have been completed with the United Railroads for joint operation of about 11,000 ft. of track. The arrangements with the United Railroads include the payment by the city of \$100,000 for a half interest in 7000 ft. of track on Ocean Avenue. On this line the city will pay the company 7½ cents per car-mile for power and maintenance of track and overhead. A separate agreement covering operation on the Taravel Street line provides that the city shall reconstruct the track to grade, using the old rails and shall put in the paving, in return for which the city shall own a half interest in the tracks. The maintenance of the line is to be shared and the city is to pay for power used at the rate of 11 cents per kilowatt-hour.

**Municipal Ownership Suggested as Way Out.**—D. M. McIntyre, chairman of the Railway Board of the Province of Ontario, declaring that the succession of disputes between the city of Toronto and the Toronto Railway was wearing upon him, has proposed to the parties that the city take immediate steps to purchase the system, instead of waiting several years for the termination of the franchise. Counsel for the city and for the company each contended that the first step should come from the other party. The issue under discussion was the company's plea of inability, on account of war conditions, to comply with a board order of April, 1918, calling for the purchase and operation of 200 new cars on the Toronto system, before Jan. 1, 1919. When the penalty for default had reached \$24,000 the company appealed to the Supreme Court without success, and thereupon returned to the Ontario Railway Board to ask for time. It was explained that efforts are being made to purchase supplies with which to build the cars in the railway company's own shops.

## Programs of Meetings

### National Safety Council

The National Safety Council has announced the selection of Cleveland, Ohio, as the meeting place for the next National Safety Congress, which will be held in the fall.

### Central Electric Railway Association

The Central Electric Railway Association calls attention to the change in the place of its annual meeting to be held on Feb. 27 and 28. The new meeting place is the Hotel Cleveland, Cleveland, Ohio, "The Hotel on the Square." The program will be announced later.

### Central Electric Railway Accountants' Association

The detail program has been announced for the thirty-third meeting of the Central Electric Railway Accountants' Association, to be held at the Hotel Anthony, Fort Wayne, Ind., on Feb. 15. The executive committee will meet at 8.30 a.m.

The regular sessions of the association will begin at the hotel at 10 a.m. Following the address of the president and the report of the executive and standing committees, C. B. Kleinhans, auditor of the Toledo & Indiana Railroad, Toledo, Ohio, will make an address on "Where the Money Comes From."

At the afternoon session J. D. Meek, vice-president of the Electric Supply Company and president of the Simplex Account Company, Indianapolis, Ind., will make an address on "Trade Acceptances."

# Financial and Corporate

## B. R. T. Loses Money

Falls Back \$3,595,000 in Net Income During 1918—Directors Give Reasons for Receivership

The Brooklyn (N. Y.) Rapid Transit Company for the calendar year 1918 showed a falling off of \$3,595,492 in net income as compared to 1917. A total of \$2,628,238 of this decrease, or more than two-thirds, was the result of operation during the second six months of the year. The accompanying detailed tables show the full effect of the higher operating expenses and fixed charges.

These figures, which are supplementary to the latest annual report of the company, published in the *ELECTRIC RAILWAY JOURNAL* of Oct. 26, 1918, were presented at the annual meeting of stockholders on Jan. 31. At this meeting officials presented a report on behalf of the board of directors explanatory of the receivership and the circumstances that led to the placing of the property under the protection of the court.

### INCOME STATEMENT OF BROOKLYN RAPID TRANSIT COMPANY FOR CALENDAR YEARS 1917 AND 1918

	1918	1917	Change
Gross revenues	\$30,982,034	\$30,085,287	+ \$896,747
Operating expenses	20,035,790	17,211,885	+ 2,823,905
Net operating revenue	\$10,946,244	\$12,873,402	—\$1,927,158
Other income	414,566	406,187	+ 8,379
Total income	\$11,360,810	\$13,279,589	—\$1,918,779
Taxes	\$2,613,750	\$2,257,292	+ \$356,458
Interest and rentals	7,263,244	5,942,989	+ 1,320,255
Total	\$9,876,994	\$8,220,281	+ \$1,676,713
Net income	\$1,483,816	\$5,079,308	—\$3,595,492

### INCOME STATEMENT OF BROOKLYN RAPID TRANSIT COMPANY FOR LAST SIX MONTHS OF 1917 AND 1918

	1918	1917	Change
Gross revenues	\$15,937,475	\$15,461,938	+ \$475,537
Operating expenses	10,691,087	8,767,103	+ 1,923,984
Net operating revenue	\$5,246,388	\$6,694,835	—\$1,448,447
Other income	216,862	210,025	+ 6,837
Total income	\$5,463,250	\$6,904,860	—\$1,441,610
Taxes	\$1,323,210	\$1,153,112	+ \$170,098
Interest and rentals	4,128,524	3,111,994	+ 1,016,530
Total	\$5,451,734	\$4,265,106	+ \$1,186,628
Net income	\$11,516	\$2,639,754	—\$2,628,238

It was said that the company joined in the application for the appointment of a receiver because the directors felt that while the necessity for a receivership might temporarily be avoided by borrowing the amounts needed to meet the obligations now payable, the ultimate result could not be long postponed or averted unless sufficient funds were provided to carry on existing con-

struction and equipment contracts and to complete the plans for rapid transit enlargement to which the system was committed.

The raising of these large amounts was found to be impossible under the financial conditions then prevailing, and especially in view of the general disinclination of the public to invest new capital in traction properties so long as the abnormally high costs of operation, due to the war, must be borne without a compensatory fare increase.

### COMPANY SOUGHT GOVERNMENT AID

In December, the urgency becoming great, the matter of an additional loan by the War Finance Corporation was taken up informally at Washington, but information was received that in view of the policy of the War Finance Corporation to restrict the exercise of its powers following the signing of the armistice, it was not in a position to consider an application for an additional loan. Inquiries through regular banking channels made it evident that the time was not favorable either for the sale of securities or for large borrowing, and the directors therefore felt that the best interests of the properties would be subserved by permitting them to be placed under the protection of the courts.

The report recited the system of temporary financing of capital requirements conducted by the company which included large borrowing from banks and trust companies and from the constituent companies of the system. It stated that so long as the system was earning substantial profits, such temporary financing presented no serious embarrassment and in the judgment of the directors was preferable to selling long-term securities at sacrifice, but when war conditions overtook the company and net earnings were largely reduced, there was no available source of capital funds except from the United States government, and "the cash became so depleted that even moneys earned for fixed charges had to be used temporarily for capital purposes."

### FLOATING INDEBTEDNESS A PROBLEM

The important problem now before the company, it was pointed out, is the provision for the floating indebtedness and for the program of improvements worked out during the last six years which in the directors' opinion are essential to adequate transportation for the community and will be a source of profit to the companies. The city's work, the report says, is not less than four years behind time. The company has expended more than \$60,000,000 in performing its part of the contracts, at least half applying to facilities not yet in operation.

## Rhode Island Receiver in Charge

Indications Point to Simplification of Corporate Structure as Ultimate Outcome of Receivership

The appointment by Chief Justice Tanner of the Superior Court of Frank H. Swan of the law firm of Swan & Keeney receiver of the Rhode Island Company, which operates all the electric railways of the State, was the culmination of a series of incidents pointing plainly to receivership as the ultimate fate of the company. The prediction is made that the outcome will be a reorganization along lines similar to that of the Boston & Maine Railroad, with a new parent company which will own outright the complete system.

The officers of the New York, New Haven & Hartford Railroad, which owns the entire capital stock of the Rhode Island Company and the United Traction & Electric Company, the principal lessor corporation, conferred several times before the petition was filed in the Superior Court. The federal trustees acquiesced.

The first subject of major importance to engage the attention of the receiver after his appointment was a payment of the second installment of back wages due on Feb. 1 to the employees under an amended decree of the War Labor Board. Inasmuch as the court's instructions to the receiver contained no provision for such a payment, a petition was filed by Mr. Swan in the Superior Court on Feb. 3 asking that he be allowed to make the payment. The amount due totals about \$72,000 in which about 2000 employees participate. No action has yet been taken by the court.

The Rhode Island Company at the present time owes the United Traction & Electric Company \$47,500, representing a part of the rental payment due on Dec. 24. Another payment of \$180,000 falls due on Feb. 24.

The receivership petition was filed by John J. Orr, a contractor employed by the Rhode Island Company. It recites the facts that the company at the close of business on Jan. 29 had a cash deposit of \$131,228 and the only securities owned, aside from those pledged, totaled \$74,000 par and are regarded as of doubtful value.

The company has paid no dividends upon its stock since June 13, 1913. The deficit for the eleven months ended Nov. 30, 1918, was \$699,628.

The total amount payable by the company each year on account of guaranteed dividends on stock was \$886,364; interest on bonds was \$267,280; rentals, \$7,550; organization expenses, \$300; total \$1,161,494. The net amount payable (less interest and dividends from bonds and stocks held) amounted to \$1,053,915.

Demand notes held by the New York, New Haven & Hartford Railroad total \$3,746,037. This with the interest unpaid, amounting to \$825,143, totals \$4,071,180. Other obligations overdue and unpaid amount to \$393,841 and the

company will be called upon to pay before April 1, 1919, the sum of \$480,212 representing State and city taxes, second and third installments of back wages due employees and rentals.

There is no intention at the present time of Mr. Swan making any changes in the directing personnel of the road.

## \$24,346,113 Is Minneapolis Valuation

### Council Committee Accepts This Figure in Connection with Negotiations for Franchise Renewal

The committee on street railway matters and extensions of the City Council of Minneapolis, Minn., on Jan. 21 fixed the valuation of the Minneapolis Street Railway, included in the system of the Twin City Rapid Transit Company. The figure set was \$24,346,113. This was the valuation determined by C. L. Pillsbury, Minneapolis consulting engineer, engaged by the city to check and revise the valuation report of City Engineer F. W. Cappelen.

The valuation was accepted in connection with the proposal for the renewal of the franchise of the company, which expires in 1923. The motion for acceptance of the Pillsbury report provided that the company be allowed a 7 per cent income on its investment. Valuations also submitted to the committee were those of the company's engineer for \$30,712,101; the central franchise committee's majority report of \$22,156,951, and the franchise committee's minority report of \$15,470,360.

In the comparative figures submitted

#### F. W. CAPPELEN

	Jan. 1, 1916	Jan. 1, 1919
Total physical property.....	\$21,152,222	\$37,856,032
Development costs.....	4,270,230	4,270,230
Water-power leases.....	491,857	491,857
Total value.....	\$25,914,309	\$42,618,119

#### C. L. PILLSBURY

	Jan. 1, 1916	Jan. 1, 1919
Total physical property.....	\$21,057,292	\$37,486,959
Development costs.....	2,775,649	2,775,649
Water-power leases.....	513,172	513,172
Total value.....	\$24,346,113	\$40,775,780

#### COMPANY VALUATION

	Jan. 1, 1916	Jan. 1, 1919
Total physical property.....	\$24,105,758	\$43,144,005
Development costs.....	5,341,462	5,311,462
Water-power leases.....	1,294,881	1,294,881
Total value.....	\$30,712,101	\$49,750,348

by Mr. Pillsbury and Mr. Cappelen the marked difference is in the "going concern value." The reports of the central franchise committee allowed nothing for this item. Mr. Cappelen placed the company's water-power leases at \$491,857, while Mr. Pillsbury places them at \$513,172. The central franchise committee reports allowed nothing for these items.

On interest during construction Mr. Cappelen allowed \$2,131,554, as against Mr. Pillsbury's \$1,440,742. The other reports gave a lower figure. The Pillsbury total was \$24,346,113, as compared to \$25,914,307 by Mr. Cappelen.

The central franchise committee's majority report gives a total of \$22,156,951, but provides, as the other reports do not, for a reduction of this total at the rate of \$438,509 per year after Jan. 1, 1916, the basis of the report.

Under this consideration the going concern value on Jan. 1, 1918, was to be \$2,411,802, and on July 1, 1923, when the company's present franchise expires under contract, the going concern value would be zero.

A 5½-cent fare was advocated by A. L. Drum, consulting engineer for the railway.

In presenting the company's valuation figures, Mr. Drum declared that the \$25,914,309 valuation placed by Mr. Cappelen now would be \$42,618,119 if the increased costs in material and operation were considered. The Pillsbury valuation, if given for Jan. 1, 1919, would be \$40,775,780. The company's valuation of \$30,712,101, as of Jan. 1, 1916, would be \$49,750,348 as of Jan. 1, 1919.

A comparison of the various valuations is given in the accompanying table.

## Railway Delinquent

### Failure of Rhode Island Company to Pay Franchise Tax of \$125,000 Referred to the Attorney General

Richard W. Jennings, general treasurer of Rhode Island, as required by law, has notified Attorney-General Herbert A. Rice of the failure of the Rhode Island Company, Providence, R. I., to pay its franchise tax. This tax approximates \$125,000 and was due on Oct. 1 last. In consequence the railway is a delinquent corporation and subject to prosecution.

Attorney-General Rice, however, is extremely loathe to start proceedings against the company as insistence upon payment of the tax would probably result in bankruptcy. It is expected the Rhode Island General Assembly will take the subject under consideration soon and attempt to solve the problem. Meanwhile Mr. Rice, it is expected, will mark time.

The federal trustees of the Rhode Island Company at a meeting on Sept. 27 considered the question of paying the State tax, but it was decided to file a record of the earnings and defer payment of the tax indefinitely. On Sept. 30 the trustees again met and reaffirmed their decision of Sept. 27.

The certificate of gross earnings filed with the General Treasurer showed them to be \$6,085,125, upon which a tax of 2 per cent, amounting to \$121,702, became due on Oct. 1. Accrued interest at 8 per cent for the ensuing four months amounts to \$3,245, making the total amount due on Jan. 1, \$124,947.

General Treasurer Jennings on Jan. 8 wrote to the federal trustees of the Rhode Island Company calling attention to the fact that the tax had not been paid and asking what the company proposed to do about meeting its obligation.

## Abandoned Lines Must Resume

By order of the State Public Service Commission, the Washington Water Power Company, Spokane, has resumed service on three of its lines which it desired to abandon. The commission will keep a check to determine whether the business justifies permanent service.

Corporation Counsel Geraghty told the City Council that there is no question, in his opinion, that the city could compel the railways of Spokane to live up to their franchises as to fares and service. According to Mr. Geraghty, the 5-cent fare must stand and the companies must provide service on all lines, in accordance with the terms of the franchises.

Mayor Fasset believes that the consolidation of the lines of the Washington Water Power Company and the Spokane Traction Company, operating the city lines of the Inland Empire System, is the correct solution of the problem of the financial difficulties of the companies. The Mayor said:

I am at work on a report to be submitted to the Council which will give my ideas on the problem. Consolidation must be preliminary to any satisfactory adjustment. Data are being obtained from other cities, particularly from Cleveland where the city is represented on the board of directors of the railway. In any event what we want is the right of the city confirmed to regulate to a greater extent the operations of the companies. The city and its people have an interest in the matter and should be heard.

## Receiver for Hocker Line

The Kansas City, Lawrence & Topeka Railroad, Kansas City, Mo., on Jan. 30 was placed in the hands of P. W. Goebel, president of the Commercial National Bank, Kansas City, Kan., and former president of the American Bankers' Association, as receiver, by Federal Judge Pollock. Foreclosure was asked by the Commerce Trust Company, Kansas City, Mo., acting as trustee for bondholders. The proceeding was begun when the railroad failed to pay the interest on its bonded indebtedness.

## Fare Results Disappointing

Operation of the United Railways, St. Louis, Mo., city and county lines, during the fiscal year of 1918, resulted in a deficit of \$1,576,125 on a valuation of \$60,000,000 at 6 per cent according to a report made to the Public Service Commission of Missouri by Richard McCulloch, president of the company.

The deficit on city lines was \$894,165 and on the country lines \$681,959, according to the figures submitted.

A statement of results of the 6-cent fare plan for seven months also was sent to the commission. It shows that the 20 per cent increase in fare on city lines has increased revenue only 10.32 per cent. The loss in passengers has been 7.82 per cent. In addressing the commission, President McCulloch asked that body to take cognizance of the conditions, so that the revenues of the company may be adjusted to insure good service, necessary betterments, and a fair return upon the investment.

### San Francisco M. O. Declines

City-Owned Lines, Without Tax and Other Comparison Charges, Have 87 Per Cent Loss in Net

The latest complete report of the Municipal Railway of San Francisco, for the two years ended June 30, 1917, shows that the net profit of \$74,768 for 1916 was converted into a deficit of \$103,908 for 1917. The details of this decline are shown in Table I.

The foregoing showing is made after the inclusion of certain "comparison" charges, which are used in order that the municipal line may be considered upon the same basis as privately owned lines. As a matter of fact, the Municipal Railway pays no taxes, and in some instances it pays nothing for services rendered by other departments of the municipal government.

#### ELIMINATION OF CERTAIN FIXED CHARGES IMPROVES SHOWING

Thus, by taking the net profit of \$74,768 shown for 1916 and adding the comparison charges of \$166,714 for taxes and \$9,182 for legal and clerical services, the "true net profit" is shown to be \$250,663. Similarly for 1917 the loss of \$103,908, when combined with comparison charges of \$125,576 for taxes and \$9,416 for legal and clerical services, becomes a "true net profit" of \$31,084.

The comparison charges decreased from a total of \$175,896 in 1916 to \$134,992 in 1917, but this did not affect the main showing of decline in the later period. The net result of operation still showed a falling off of \$219,579 or 87 per cent.

The poorer showing in 1917 was due mostly to the decrease in passenger revenue. The total passengers decreased from 47,886,784 to 36,234,723, the loss in 4-cent fare traffic being

TABLE I—INCOME STATEMENT OF MUNICIPAL RAILWAY OF SAN FRANCISCO FOR YEARS ENDED JUNE 30, 1916 AND 1917

	1916	1917
Passenger revenue.....	\$1,970,477	\$1,470,193
Miscellaneous revenue.....	12,327	7,717
Total operating revenues.....	\$1,982,804	\$1,477,910
Ways and structures.....	\$40,457	\$50,977
Equipment.....	77,744	69,703
Power.....	258,163	211,506
Conducting transportation.....	731,508	596,446
Traffic.....	210	295
General and miscellaneous.....	56,527	37,213
General and miscellaneous—comparison charges.....	9,182	9,416
*Depreciation, and injuries and accidents.....	352,075	264,727
Total operating expenses.....	1,525,875	1,240,281
Net operating revenue.....	\$456,929	\$237,629
Income from municipal bonds owned.....	24,039	22,108
Gross income.....	\$480,968	\$259,737
Taxes (comparison charges required by charter):		
State franchise 5 1/2 per cent on gross revenue....	\$103,854	\$78,500
Municipal franchise 5 per cent on passenger revenue.....	59,149	44,121
Municipal car license.....	2,955	2,955
Federal income tax, 1 per cent on net income.....	755	.....
Interest on funded debt.....	\$259,330	\$166,714
Less amount capitalized.....	19,844	239,486
Total deductions.....	\$406,200	\$363,645
Net profit for the year after inclusion of comparison charges.....	\$74,768	\$103,908

\*The reserve for depreciation and renewals is computed at 14 per cent of the gross operating revenues, instead of on annual percentages of physical value of the property. The rate of 14 per cent is arbitrary, being based on Chicago experience as reported by Bion J. Arnold (12 per cent) and the opinion of Delos F. Wilcox as expressed in a paper on "Elements of a Constructive Franchise Policy."  
 There is an added 4 per cent of the gross revenue for injuries and accidents, this percentage being based on the experience of United Railroads of San Francisco. The total reservation is thus 18 per cent of the gross operating revenues.  
 † Deficit

from 39,295,429 to 29,230,644. As a result the passenger revenue fell off \$500,284, while the operating expenses dropped only \$285,594.

The passenger revenue per car-mile for the year ended June 30, 1916, was 30.99 cents, and per car-hour \$2.6729. In the following year, however, the revenue figures dropped to 27.65 cents per car-mile and \$2.5317 per car-hour. The operating expenses declined from 18.32 cents per car-mile to 18.17 cents, while per car-hour they rose from \$1.5798 to \$1.6637. Miscellaneous statistics are given in Table II.

### \$3,000,000 at Once for the B. R. T.

Federal Judge Julius M. Mayer on Feb. 1 appointed former Judge E. Henry Lacombe as special master in chancery to pass upon claims against the Brooklyn (N. Y.) Rapid Transit Company and subsidiaries that are in possession of Lindley M. Garrison as receiver. In a supplemental order the court fixed March 15 as the date on which all claims must be in.

On the same day an order was signed authorizing the receiver to borrow \$3,000,000 with which to meet the pressing obligations of his companies. No action was taken on the petition of the receiver to be permitted to borrow more than \$16,000,000 on receiver's certificates.

Another order gave leave to the receiver to negotiate with bankers who have loans of more than \$3,000,000 to the company outstanding. The receiver will pay interest as it comes due and arrange to pay the principal, the lenders to hold their collateral from sale in the meantime. This order was agreed upon after a number of lawyers representing various banks had discussed it. They objected to an order restraining their clients from putting Brooklyn Rapid Transit collateral for loans in the market without giving notice of their intention to the receiver, but were in agreement that evil effects would follow the wholesale selling of the company's securities.

The receiver said he would not pay interest and then have the collateral sold in the open market.

The matter, as finally ordered, leaves the question of loans and their collateral to adjustments between the receiver and the various creditors of the company.

TABLE II—STATISTICAL DATA OF MUNICIPAL RAILWAY OF SAN FRANCISCO FOR YEARS ENDED JUNE 30, 1916 AND 1917

	1916		1917	
	Total Amount	Per Car-Mile	Per Car-Mile	Total Amount
Total passenger revenue.....	\$1,970,477	\$0.3099	\$2.6729	\$1,470,193
Net operating expense.....	\$1,164,617	\$0.1832	\$1.5798	\$966,137
Operating earnings (taxes, depreciation charter charges not deducted).....	\$305,860	\$0.1267	\$1.0931	\$504,055
Ratio of earnings to passenger revenue.....	0.4089		0.3428	
Total taxes and charter charges	\$175,896	\$0.0277	\$0.2386	\$134,992
Ratio to passenger revenue.....	0.0893		0.0918	
Operating expense, taxes and charter charges.....	\$1,340,513	\$0.2108	\$1.8183	\$1,101,130
Ratio to passenger revenue.....	0.6803		0.7490	
Depreciation.....	\$352,075	\$0.0553	\$0.4776	\$264,727
Ratio to passenger revenue.....	0.1787		0.1800	
Operating expense and depreciation.....	\$1,516,692	\$0.2385	\$2.0573	\$1,230,865
Operating expense, depreciation, taxes and charter charges	\$1,692,589	\$0.2662	\$2.2959	\$1,365,857
Ratio to passenger revenue.....	0.8589		0.9290	
Net income from operation (after deducting depreciation, taxes, charter charges, etc.).....	\$277,888	\$0.0437	\$0.3769	\$104,335
Ratio to passenger revenue.....	0.1410		0.0710	
Passenger car-mileage.....	6,358,543			5,317,269
Passenger car-hours.....	737,213			580,716
Total platform expense (37 1/2 cents per hour, eight hours net day).....	\$600,297	\$0.0944	\$0.8143	485,851
Total number of cars owned.....	198		198	
Track owned and operated (single track).....			45.59	43.44
Track owned and operated jointly with United Railroads.....			1.04	1.04
Total single-track mileage operated.....			46.63	44.48



# Financial News Notes

the tax was computed were \$2,312,010 in 1917, and \$4,212,670 in 1918. Every line in the city showed an increase. The Fort Lawton line's gross earnings almost doubled.

**Representatives of Public on Board.**—At a special meeting of the Selectmen of Plymouth, Mass., recently Edward R. Belcher, Ellis W. Brewster, George E. Howland and Michael D. Welch were nominated to represent the town on the board of directors of the Brockton & Plymouth Street Railway. Each of the other towns along the line of the railway has nominated one director; the bondholders and Stone & Webster, who operate the road, will nominate one director each, and it is anticipated that these men will do their best to work out a plan by which the road may be kept in operation.

**Merger Approval Refused.**—Approval of the proposed merger of the Bridgeton (N. J.) Electric Company with the Electric Company of New Jersey has been refused by the Board of Public Utility Commissioners. The floating debt of the Bridgeton company, the commission decided, should be funded before any merger is effected. The commission rejected also, in part, the application of the Bridgeton company for the right to transfer 500 shares of its preferred capital stock at par to the American Railways, but authorized the transfer of 400 shares. Of the proceeds, the commission will allow \$35,000 for working capital and \$5,000 for construction work in progress as of Dec. 31, 1917. The American Railways also controls the Bridgeton & Millville Traction Company.

**Into Hiding for the Winter.**—The Portsmouth, Dover & York Street Railway, Portsmouth, N. H., has quit for the winter. The road expects to resume on April 30. Last winter the road fell a victim to snow for a spell. This winter the operation of the relentless law of economics has done just as thorough, although less spectacular, a job as was done a year ago by the physical elements. There is one untoward factor this time, however. The roads are open and the auto bus has come in. It is getting whatever traffic there is. How far the railway will be able to regain this business remains to be seen. The pessimists think it will be lost almost entirely and forever. Among the apostles of despair is the *York Transcript*. That paper

said recently: "It is the opinion of a great many people that the present move is simply the beginning of the end of the road here. W. A. Meloon, the receiver, says that there is no intention of junking the road, although there has been considerable talk among the owners to that effect. When the time comes to pull up the rails and tear down the trolley wires, and sell the whole business to the junk man, it will be done. Just how near that time is we have no means of knowing."

**Two Additional Columbus Directors.**—In order to insure its slate of directors at the annual meeting of the stockholders of the Columbus Railway, Power & Light Company on Jan. 28, the proxy committee secured an increase of two members in the personnel of the board. The new board consists of W. C. Willard, W. A. Gill, Norman McD. Crawford, Charles L. Kurtz, D. Meade Massie, A. S. Hammond, Walter B. Beebe, Samuel Ungerleider, Emil Kiesewetter, F. R. Huntington, Harry S. Holton, B. W. Marr, E. A. Reed and Frank P. Hall. The last four are new members nominated by the proxy committee. One of them succeeds E. K. Stewart, recently resigned, and another takes the place of R. H. Platt, who was elected at the reorganization meeting on Jan. 10, but could not serve because of pressure of other interests. The other two are the additional members, making fourteen in all instead of twelve. The board is now fully in the hands of the stockholders' protective committee, which will soon pass out of existence, since its purpose has been accomplished. The board organized by the election of the following officers: President, Charles L. Kurtz; vice-president and treasurer, Norman McD. Crawford; vice-president, Samuel Ungerleider; secretary and auditor, P. V. Burlington; assistant secretary and auditor, H. M. Burlington; executive committee, Charles L. Kurtz, F. R. Huntington and Walter B. Beebe. Harold W. Clapp was retained as manager. On Dec. 31, 1918, the company showed a surplus balance of \$247,810 as compared with \$191,819 for 1917. Against the 1918 amount, however, is charged a contingent liability of \$142,152 for the rebate slips issued to passengers who paid the 5-cent fare for the period during which the company disregarded the franchise rate. After a deduction for this a balance of \$105,658 remained.

**Oklahoma Railway Notes Offered.**—The Mississippi Valley Trust Company, St. Louis, Mo., is offering Oklahoma (Okla.) City Railways' \$375,000 bonded-secured 8 per cent gold notes, dated Sept. 1, 1918, due March 1, 1921.

**New American City Director.**—At a meeting of the American Cities Company in New Orleans, La., on Jan. 20 Lynn H. Dinkans, president of the Interstate Trust & Banking Company, New Orleans, was elected a director to succeed Walter C. Weiss, resigned.

**Valuation at St. Louis to Proceed.**—The Supreme Court of Missouri having decided the authority of the Public Service Commission with respect to fares, the commission announced on Jan. 27 that a valuation of the physical property of the United Railways, St. Louis, will be begun within sixty days.

**Abandonment Case Heard.**—The Southern New York Power & Railway Corporation's application for approval of the abandonment of the normal school line in Oneonta, N. Y., was submitted to Public Service Commissioner Cheney on Dec. 27, briefs to be filed, after which the commission will make determination.

**Foreclosure Sale on Feb. 15.**—Richard C. Swing, special master commissioner, will sell the property of the Cincinnati & Columbus Traction Company, Cincinnati, Ohio, at public auction at Cincinnati on Feb. 15, without regard to a minimum price. The sale will be made in accordance with the decree of foreclosure of the \$600,000, 5 per cent mortgage of 1905 and the \$250,000, 5 per cent mortgage of 1907.

**Tax Indicates Large Gross Earnings.**—The increase in electric railway business in Seattle, Wash., in the year 1918, is shown in the check for 2 per cent tax on gross earnings forwarded to the city by the Puget Sound Traction, Light & Power Company. The check was for \$92,728 as compared with \$72,272 for 1917, or an increase of 28 per cent. Total gross earnings on which

## Electric Railway Monthly Earnings

ATLANTIC SHORE RAILWAY, SANFORD, ME.					
Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
Im., Dec., '18	\$13,371	\$24,945	\$11,574	\$510	\$11,064
Im., Dec., '17	12,450	23,250	10,800	473	11,273
CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO					
Im., Nov., '18	\$51,441	\$31,203	\$20,238	\$16,084	\$4,154
Im., Nov., '17	48,816	28,012	15,804	11,635	2,169
11m., Nov., '18	511,629	\$359,706	171,923	136,552	35,371
Im., Nov., '17	496,163	\$309,912	186,251	128,473	\$57,778
* Includes taxes	† Deficit.	‡ Includes non-operating income.	§ Includes		

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.					
Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
Im., Dec., '18	\$3,782,224	\$2,567,286	\$1,214,938	\$1,509,382	\$84,556
Im., Dec., '17	3,740,927	2,076,032	1,664,895	1,102,031	\$562,863
6m., Dec., '18	19,953,159	14,007,725	5,945,434	8,739,865	\$1,805,569
6m., Dec., '17	19,669,015	11,094,712	8,574,303	6,492,085	\$3,354,218
LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO					
Im., Nov., '18	\$178,818	\$139,564	\$39,254	\$35,917	\$3,337
Im., Nov., '17	142,814	\$101,922	38,892	35,149	3,743
Im., Nov., '18	1,908,688	1,443,106	465,582	397,030	140,552
Im., Nov., '17	1,168,439	\$1,103,339	515,100	381,998	133,102

accruals under rapid transit contracts with city, payable from future earnings.

# Traffic and Transportation

## Oshkosh Willing to Help

After Frank Description of Railway Situation, Local Public Is Trying to Give Relief

A loan of \$100,000 for the purchase of fifteen new cars, relief from paving obligations and city support of a 6-cent fare application—these are the pressing needs of the electric railway situation in Oshkosh, Wis. Such an outline of the situation was presented to a group of seventy-five representative professional and business men on Jan. 10 by Raymond H. Smith, vice-president and general manager of the Eastern Wisconsin Electric Company. The local public is showing a spirit of willingness to aid the company, and steps along the lines mentioned are now being taken.

Mr. Smith analyzed the electric railway situation in a frank, clear-cut and exhaustive way. He pointed out that during the year ended Aug. 31, last, the company fell \$6,201 short of meeting operating expenses on the city and interurban lines, with no allowance for depreciation. Mr. Smith emphasized strongly the interest the public should take in the property, saying that anyone is wrong who thinks that the company can rub a magic lamp and thus secure the power to continue operation at a loss and the ability to mesmerize investors. Continuing, he said:

In the past, the public and the companies have endeavored to obtain the greatest possible advantage for their respective interests, without considering the ultimate effect upon the industry or the community. There must be a recasting of the relationship which has existed between public utilities and the communities served. The Eastern Wisconsin Electric Company fully recognizes its responsibilities, is aware of the condition of the present rolling stock and admits that the public has a right to expect adequate service in comfortable cars. The company, however, must be permitted to charge a sufficient fare to make possible the service and equipment desired by the public.

The public should realize that their interest in the continued efficient operation of a public utility is such that it becomes imperative that they should recognize some responsibility for financing it. Such recognition may very properly lead to putting the credit of the public back of the utilities, when necessary, in return for the class of service demanded.

According to Mr. Smith, the great needs at present are these:

1. That the city finance the purchase of twelve or fifteen modern city cars, under a plan whereby these cars will be leased to the company, with an agreement on the part of the company to copy the city the purchase price of the cars, with interest, over a period of time to be agreed upon.
2. That the city relieve the company of the present obligation to pave between its tracks and 1 ft. outside.
3. That the city join in the application for a 6-cent fare to be made effective at the earliest possible date, and that it recognize the principle that adequate and dependable service, which the public is entitled, must be accompanied by a fare sufficient to make this possible.

As a result of the conference a committee of seven men was appointed to

formulate plans of aid. The present indications are that the city authorities will furnish the relief from paving taxations and that citizens will finance the purchase of the cars. The city itself cannot legally finance the purchase of new cars.

The determination of a higher fare will in all likelihood be left to the Wisconsin Railroad Commission, before which a 6-cent application is now pending. During the hearings the city took the position that it would not object to a 6-cent fare if new cars were purchased. The city authorities, however, are still holding out for a special workmen's rate between 6 and 7 a.m. and 6 and 7 p.m. The railway insists upon a straight 6-cent fare.

## Zone System on Boston L

James F. Jackson, chairman of the board of trustees of the Boston (Mass.) Elevated Railway, announced on Feb. 4 that either late in March or early in April the trustees expect to introduce as an experiment a system of two zones, each with a 5-cent fare, the inner zone to cover territory between Boston City Hall and a distance of 2.5 to 3 miles therefrom, in place of the present flat fare of 8 cents.

The zone system to be tried resembles that proposed by Albert S. Richey in a recent report to the trustees, abstracted in these columns, with the exception that the boundary between the two zones is likely to be located nearer the business district than was suggested in the earlier studies, chiefly as a matter of operating convenience.

Professor Richey discussed the possible combinations of fares and zone boundaries necessary to produce stated revenues, and the trustees, after considering this report and also going over short reports of Peter Witt, Cleveland, decided to try the straight 5-cent fare unit instead of using odd-cent fares.

The tentative zone limits proposed include such traffic points as Harvard Square, Cambridge; Coolidge Corner, Brookline; Brighton Avenue and Commonwealth Avenue, Boston; Wellington Bridge, Fellsway; Main Street and Broadway, Somerville; Brookline Village, Eggleston Square, Boston; Everett elevated terminal; Uphams Corner, Dorchester, and others. Beyond these points the fare into and out of the business center will be 10 cents. Prepayment areas may be established at some of the zone boundaries.

It is estimated that about half the entire population in the territory served by the system, all of Charlestown, Chelsea, East Boston and South Boston, will be included in the inner zone. In the meantime the 8-cent fare unit will be maintained.

## Service Department Started

Dallas Railway Appeals to Its Patrons for Advice and Help in Managing Its Lines

The Dallas (Tex.) Railway has opened a service department. It is in charge of Homer Fisher, with title of assistant general manager. Mr. Fisher will receive all complaints and suggestions for the betterment of the service, and will explain all shortcomings and defects of the company.

The company will encourage the general public to visit the office of Mr. Fisher and make known all complaints and suggestions for improvements in the service. At the same time a campaign of newspaper advertising has been started to educate the public in the problems of operating a city railway system. In large display ads causes and reasons for irregular or delayed service is being set forth. In discussing the new department, Richard Meriwether, general manager said:

We want the citizens of Dallas to feel that they can come here and make reports of any sort that will help us to improve the railway service. This department is open to receive suggestions and criticisms of all kinds. Constant courtesy and careful attention to little things is the rule to follow in giving good service. It is our aim, but we need the help of the public.

It would be amazing if everything were handled to the satisfaction of the public as it is almost impossible to eliminate mistakes where so many workers are employed. We are doing our best, but the public will have to aid us by making suggestions through our service department.

One of the ads announcing the new service department follows:

### Your STREET RAILWAY —SERVICE—

In the Street Car business we are all salesmen—we are selling Street Car rides at Five Cents each.

This Company is simply a big specialty department store, having for sale only one article—Street Car Service.

It would be amazing if all the sales were being handled to the complete satisfaction of the customers, and if some errors, some inexcusable mistakes, were not being made by some of our large army of salesmen.

It is the purpose of this Dallas Railway Company to serve in the best possible way by furnishing first-class, dependable Street Car Service at all times.

We want to please our patrons, and while we believe we do please the greater part of them, nevertheless we want to please all of them, if it is possible. We want to reduce to a minimum opportunities for reasonable criticisms. We have, therefore, established a

### SERVICE DEPARTMENT

We want every citizen of Dallas to feel that they can go to this department and make reports of any sort that will help us to improve the street car service. It is open to receive suggestions and criticisms of all kinds. Constant courtesy and careful attention to little things is the rule to follow to give good service. This is our aim. We need your help. If you write your criticisms address them to Service Department, Dallas Railway Company, Room 221, Interurban Building. If you telephone just call Main 8080 and ask for the Service Department of the Street Railway.

What suggestions have you to make to-day?

DALLAS RAILWAY COMPANY  
Interurban Building.

The Dallas Railway operates 86 miles of line. It is the consolidated Strickland-Hobson lines and operates under the model franchise enacted several years ago.

### Fare Bill in Washington

Measure Would Insure Home Rule for Cities With Respect to Local Electric Railway Fares

The Phipps bill, introduced at the present State Legislature at Olympia, Wash., would authorize city councils to raise city railway fares above 5 cents. The present law fixes 5 cents as a maximum charge for fares, but there is some question as to whether this rule could be enforced. Tacoma, for example, authorized a 7-cent fare.

As the Phipps bill is drawn, only city councils could grant permission to increase fares. An effort is being made, however, to give the Public Service Commission, a disinterested party, authority to legalize a fare increase.

Some members of the Senate point out the possibility that a city council might be willing to increase fares where the city has an interest to promote, but might, for political reasons, refuse to give relief in other cases.

U. E. Harmon, city attorney of Tacoma, Mayor C. M. Fassett and Corporation Counsel J. M. Geraghty of Spokane, contend that municipal authorities should be authorized to grant necessary fare increases. They assert that municipalities stand closer to the people than a state commission, and would be more apt to give proper relief.

Chairman E. F. Blaine of the Public Service Commission declares that unless the commission has authority over rates, it should not be expected to control service. He pointed out that the commission, in considering demands for improved service, had to take into consideration the ability of the company to pay taxes, interest charges, wages, franchise obligations, and meet the expense of improved service. If the commission was expected to order service that would increase operating costs, the commission should have power to see that the earnings were sufficient to meet expenses.

The bill has been returned to the Senate from the public utilities committee in exactly the form in which it was presented to the committee by Don Kaiser, Spokane, attorney for the Spokane & Inland Traction Company.

### Des Moines Case Being Argued

The hearing on the petition of the Des Moines (Iowa) City Railway for relief in the matter of fares was started before Judge Martin J. Wade the afternoon of Feb. 3. Practically all of the first two days were devoted to arguments by opposing counsel, and little headway was made on the case itself.

Attorneys for the city of Des Moines attempted to go back to the campaign leading up to the granting of the franchise three years ago to show that Emil G. Schmidt, president of the railway, had opposed acceptance of a franchise calling for a sliding scale of fares and had said that he preferred to take his chances with a straight 5-cent fare. Advertisements used by the company

during the campaign were also introduced.

Attorney William Chamberlain, Cedar Rapids, appearing as a witness for the company told of the receipts during the past year and of the deficit of \$375,000. The company's counsel also sought to show that these deficits accrued in spite of the franchise provisions that the company was guaranteed a sufficient fare to meet interest charges, operating and other expenses.

In the arguments between opposing attorneys Judge Wade finally advised both sides to confine their testimony to the terms of the franchise and not to the merits of the rate dispute and stated that he would not admit figures from either side.

There was every indication at the close of the session on Feb. 4 that the hearing would continue another day or two.

### City Club Opposes Fare Increase

A protest against any increase in rates on the city rapid transit lines in New York City has been made by the committee on public service of the City Club of New York. At the same time it recognizes that war conditions have so increased the prices of labor and materials that some or all of the railway companies may not now be able to meet operating expenses and existing fixed charges with their present earnings.

It suggests the following steps as the most feasible solution not requiring constitutional changes:

(a) The companies to accept a modern franchise and agree to operate as one company, and

(b) The city to cancel paving and special charges and permit the discontinuance of certain lines or portions of lines and the reduction of service on other lines.

If the companies are unwilling to accept these suggestions, the committee sees no solution to the existing difficulties except through the process of insolvency or condemnation proceedings looking toward ultimate municipal ownership of all lines, although it points out that municipal ownership does not mean municipal operation, but as the city must have the power to operate as a last resort it recommends the following:

The constitutional and statutory changes necessary to enable the city to condemn, own and operate, if necessary, all types of transit lines.

The necessary legal steps to enable the city to issue income bonds as a first lien against the net revenue of the lines which it may acquire.

Steps to procure legislation permitting the city to operate surface lines in the same manner it now has the power to operate rapid transit lines.

The members of the committee on public service of the club are Henry C. Wright, Delos F. Wilcox, John P. Fox, Harry G. Friedman, Charles V. Halley, Jr., and Milton B. Ignatius.

The recommendations of the committee were embodied in a letter sent to Mayor Hylan and the Board of Estimate of New York City.

### Fare Increases in 348 Cities

176 Cities of More Than 25,000 Population Are Paying More—Only Six States Unrepresented

In 348 cities in the United States and Canada electric railway fares have been increased, according to the information bureau of the American Electric Railway Association. With the exception of Florida, Idaho, Kansas, Nevada, Tennessee and Wyoming every state in the Union is represented. Of the 277 cities in the country having a population of 25,000 or more, 176 are paying an increased car fare. Of the remaining 101 cities the electric railways of fifty-three are seeking relief of some sort.

Character of Fare	Where Effective	
	Cities	States
Unit fares:		
10-cent fares.....	27	*5
8-cent fares.....	18	3
7 cents, plus 1 cent for transfer.....	17	1
7-cent fares, with 10-cent charge for owl service.....	13	*2
7-cent fares.....	57	*19
6-cent fares.....	155	*34
5 cents, plus 1 cent for transfer.....	7	3
5 cents, with 10-cent charge for owl service.....	6	*5
Reduced rates eliminated.....	49	*22
Zone systems:		
7 and 5-cent zones, 10 cents between.....	1	1
6-cent zones.....	3	1
Two or more 5-cent zones.....	5	1
6-cent central, 2-cent outside zones.....	1	1
5-cent central, 7-cent outside zone, overlapping central zone.....	1	1
5-cent central, 2-cent outside zone	4	2
5-cent central zone, 3 cents per mile outside.....	1	1

\* Includes Canada, or District of Columbia.

Twenty-seven cities in five states are now paying a 10-cent fare, the list having been swelled by the addition of the cities served by the Bay State Street Railway. Thirteen cities are operating under a zone system of some sort, the length of the zones and the amount of the fare varying greatly.

By far the greater number of increases have been from a 5-cent to a 6-cent fare, although fifty-seven cities are paying 7 cents and eighteen are paying 8 cents, sixteen more are paying 7 cents, with an additional charge of 1 cent for a transfer, and thirteen are paying the 7-cent fare, with a 10-cent charge for owl service.

The urban population of the United States is estimated at between 42,000,000 and 43,000,000, of which approximately 23,000,000, or more than half, is paying increased fares.

An analysis of the information made public by the association is contained in the accompanying table.

### War Veterans Replace Women

The women conductors employed exclusively on the Kingston (Ont.) Street Railway during the war are to be relieved of their duties and replaced by war veterans. The women have been popular with the patrons of the road. They will receive ample notice of intention to dispense with their services, "or its equivalent."

### Houston Voters Upheld

The City Commission of Houston, Tex., has enacted an ordinance repealing the 6-cent fare ordinance and restoring the 5-cent fare. This action was taken immediately after the Sixty-First District Court had disposed of the petition of the Houston Electric Company, seeking mandamus to compel the City Commission to permit the railway to collect 6-cent fares as provided in the city ordinance adopted last September.

Soon after the 6-cent fare ordinance was adopted, on petition from the required number of voters, the commission submitted the measure to the people, and the proposal was overwhelmingly rejected. The railway then filed suit, contending that the City Commission had no authority to delegate its rate-making powers to the people, and that the referendum election on the 6-cent fare ordinance was illegal. This case the court has just decided adversely.

The railway is now confronted with the alternatives of trying to prove to the court that the 5-cent fare is unjust and confiscatory, or of carrying its case against the action of the City Commission to the higher courts on appeal.

## Transportation News Notes

**Birney Cars in Portland.**—The first of twenty-five Birney safety cars have been put into service by the Portland Railway, Light & Power Company, Portland, Ore.

**Fare Increase in Houghton.**—The Village Council of Houghton, Mich., has voted favorably on the petition of the Houghton County Traction Company to increase its fare from 5 cents to 6 cents.

**Skip Stops at Dayton to Be Abandoned.**—The City Commission at Dayton, Ohio, has decided to amend the skip-stop ordinance in such a way as to abolish it. The commission has received many personal requests and petitions protesting against the plan as being unsatisfactory.

**Douglas Wants Seven Cents.**—The Douglas Traction & Light Company, Douglas, Ariz., has filed a petition with the Corporation Commission of Arizona, asking that it be granted the privilege of increasing fares in Douglas from 5 cents to 7 cents on cash fares and to 6 cents on ticket fares.

**Thirty-Ride Book Authorized.**—The Public Service Commission of Illinois has authorized the Chicago & West Towns Railway, Chicago, Ill., to put in a thirty-ride ticket book, good between La Grange and regular stops East of Riverside, for bearer, to be used within one year from date, for \$2.75.

**Against Jitneys in Trenton.**—The City Commission of Trenton, N. J., has refused to grant an application of a company to operate jitneys along the line of the Trenton & Mercer County Traction Corporation. The commissioners believed the jitney would increase the traffic congestion in the center of the city.

**Presents Employees with Insurance Policies.**—Each conductor and motorman employed by the Columbus, Delaware & Marion Electric Company, Columbus, Ohio, has been presented with a life insurance policy for \$1,000 by the company. So long as the men are in the railway's employ the premiums on this insurance will be kept up by the company.

**Wants to Use One-Man Cars.**—The Middlesex & Boston Street Railway, Newtonville, Mass., has petitioned the Public Service Commission for permission to operate one-man cars on its line on Commonwealth Avenue, from Lake Street to Aburndale. The company says that it plans to equip the cars with safety devices which have been approved by the commission.

**No Loading Platforms at Present.**—Loading platforms, as recommended by John A. Beeler in his report on ways for improving traffic conditions in Dallas, Tex., will not be installed at once, according to M. N. Baker, supervisor of public utilities. Mr. Baker said he believed the city should solve several other traffic problems before building the loading platforms.

**Says Road Is in Contempt.**—The city attorney of Monroe, Mich., on Jan. 24 filed an affidavit of contempt against the Detroit, Monroe & Toledo Short Line, claiming that the company had violated the terms of an injunction issued some time ago, wherein the court sustained the contention of the city that the company could not charge more fare between Detroit and Monroe than was provided for in a Monroe city franchise.

**Zone Collection Discontinued.**—The Public Service Commission of Illinois has authorized the discontinuance of the zone system of collecting fares by the Peoples' Traction Company and authorizing rates on basis of 2 cents per mile between Galesburg and Abingdon. The commission has also authorized the discontinuance of commutation tickets and has directed the company to redeem the outstanding tickets. The new rates are to be in effect until Oct. 1, 1919.

**Six-Cent Fare Asked at Akron.**—An ordinance was introduced in the City Council of Akron, Ohio, on Jan. 27 which provides for a 6-cent fare for the city lines of the Northern Ohio Traction & Light Company. The firm which recently submitted a financial report on the situation to the City Council will be asked to have representatives at a conference on Feb. 6 to discuss the matter. Additional time has been granted to the local committee which is investigating non-essential car stops.

**Inter-Company Transfers in Force.**—Inter-company transfers at important intersections and points of contact of the lines of the Capital Traction Company, Washington Railway & Electric Company and Washington-Virginia Railway were issued beginning on Feb. 1. This is in accordance with the recent order of the Public Utilities Commission directing establishment of a comprehensive system of inter-company transfers between the various lines. No transfers are issued on inter-company transfers and vice versa. Inter-company transfers are issued only to persons paying a cash fare.

**Express Service on Municipal Line.**—The Seattle Municipal Railway has started a limited express service on the municipal railway between the northern terminus at Ballard and the central business section of the city during rush hours. Beginning at 7 o'clock, three limited cars leave the north terminus at intervals of fifteen minutes. These cars do not stop to take on or discharge passengers between the corner of Twentieth Avenue Northwest and Leary Avenue, and the corner of Third and Stewart Street. Five limited cars will be employed to care for the afternoon rush. The limited cars cut the ordinary running time of each trip about six minutes.

**Metal Tokens in Baltimore.**—On Feb. 1 the United Railways & Electric Company put into circulation in Baltimore a metal check which will be accepted as a 6-cent fare on all its lines, including the Blue Bus line of the Baltimore Transit Company. All paper tickets still in the hands of the public are being accepted as heretofore, but no more will be sold, nor will the paper tickets be accepted on the Blue Bus line. The metal fare checks are being sold by all conductors in reasonable quantities. They may be obtained in any quantity at the various places where paper tickets have been on sale, including general office of the company, at the department stores and newspaper offices.

**Tokens of Appreciation.**—Two employees of the San Diego (Cal.) Electric Railway, W. H. Barrett, inspector, and W. M. Ziegler, motorman, were conducted to the office of W. Clayton, vice-president and managing director, by M. J. Perrin, manager of transportation, recently. They were introduced with the remark by Mr. Perrin that he had been talking rules and regulations to these men for so long a period, in fact a matter of twenty years, that he considered the time ripe to bring them before the chief operating official for a hearing. The occasion for the visit, however, proved to be the presentation of solid gold Howard watches and gold monogrammed fobs, the reward for twenty years' continuous service with the San Diego Electric Railway.

**Courtesy First in Brooklyn.**—With a view to affording the maximum courtesy and efficiency in handling the rush-hour crowds, Lindley M. Garrison, re-

ceiver of the Brooklyn (N. Y.) Rapid Transit Company has asked Traffic Manager Dempsey to advertise for men qualified physically and temperamentally to serve as members of the special squad of platform men. This squad will be composed chiefly of ex-soldiers, thoroughly accustomed to discipline and self-restraint. An advertisement, which is to be placed in the cars of the system, will call for exceptionally tall men of unusual physical strength. Candidates accepted will be trained to qualify in cool-headedness, courtesy and intelligence in the handling of crowds, and to equip them for the exercise of firmness in quelling disturbances and suppressing the street car rowdy whenever occasion arises.

**City of Toledo Appeals.**—On Jan. 30 the City of Toledo, Ohio, appealed from the United States District Court (Judge J. M. Killits) in the United States Courts of Appeals at Cincinnati in the case enjoining the municipality from enforcing its franchise ordinance in which a fare rate of 3 cents was stipulated. The appeal was in the suit filed in the United States District Court against the Toledo Railway & Light Company and the city of Toledo by Henry L. Doherty & Company. The action was based on a judgment for about \$84,000 obtained in a county court against the company, from which payment could not be obtained because of the restrictions placed on it by the franchise and fare-rate ordinances being enforced against the company by the city. In his injunction order, issued in August, 1918, the court restrained the city from interference with the company in the collection of fares of 5 cents and 1 cent for transfers and a 1-cent fare for children under eight years of age.

**Worcester Case Presented.**—The case of Worcester (Mass.) Street Railway for a 7-cent fare was started before the Public Service Commission on Feb. 4. Bentley W. Warren, representing the company, which is now charging 6 cents, presented figures to show the company was unable to pay taxes or interest without dipping into its surplus account; that it could no longer borrow from the banks and could not sell any bonds to procure funds, or even to dispose of short-time paper. Increased wages was the chief item accounting for need of greater revenue, according to Mr. Warren. He said the company earned \$112,603 in 1918, which was only 1 1/2 per cent on the stock. This amount was exclusive of a proper depreciation account. There remains \$947,000 of loans and notes payable on the balance sheet, for which at present the company has no prospect of making any provision unless an increased fare is allowed. H. R. Whitney, engineer for the company, estimated the gain from a 7-cent fare for 1919 to be \$405,450, allowing for a decrease in traffic of 10 per cent to 15 per cent. The hearing will be continued. The books of the company were recently thrown open to the city accountants.

## Legal Notes

### CALIFORNIA.—*Injury from Platform Appliance Gives Presumption of Negligence.*

Where plaintiff showed that she was injured when alighting from defendant's street car through the catching of her skirt upon a knob which served as a bumper to stop the sliding platform gate of the car, she was entitled under the doctrine of *res ipsa loquitur* to presumption of negligence. The fact that the claim agent of the company had received no report of prior accidents of this character would not be a complete defense to the charge of negligence. (*Sander vs. Los Angeles Ry. Corp.*, 175 Pacific Rep., 901.)

### ILLINOIS.—*Where Railway Maintains Pavement, It Can Be Sued Directly When Accident Occurs.*

Where a street railway, in consideration of its license to construct its road on the street, has agreed with the city to keep the pavement in repair, persons sustaining injury through its failure may maintain suit directly against the company to avoid circuitry of action. (*Fowler vs. Chicago Rys.*, 120 Northeastern Rep., 635.)

### ILLINOIS.—*After Tracks Are Elevated Obligation to Pave Ceases. Lots Used for Railway Purposes Are Subject to Usual Assessments.*

The duty of a railroad company imposed by ordinance to pave streets between the tracks and for 2 ft. beyond the rails ceased when the road was elevated.

Lots owned by a railway company and used for railway purposes are subject to assessment for benefits when the streets on which they abut are paved. (*Village of Oak Park vs. Chicago & West Towns Ry.*, et al., 120 Northeastern Rep., 761.)

### MASSACHUSETTS.—*Company Not Responsible for Unusual Accidents.*

Where the conductor of a street car, facing to the rear, rang up a transfer, and his elbow struck the glasses of a passenger, who had risen behind him to be near the door at his stop and the glasses broke and cut the passenger's eyes, the injury was purely an accident, not avoidable by rational care required by a common carrier respecting its passengers. (*Nichols vs. Boston Elevated Ry.*, 120 Northeastern Rep., 847.)

### MISSISSIPPI.—*Release to One Joint Tortfeasor Does Not Release Other Except Pro Tanto.*

A telephone lineman while engaged at work came in contact with the wire of a power company and was killed. His heirs settled with the telephone

company for \$7,500 and then brought a suit against the power company. Negligence of the latter being shown, the court held that the payment received from the telephone company was a release for the power company only *pro tanto* and is to be considered only as part payment for the damages adjudged by the court against the power company. (*Bogdahn et al. vs. Pascagoula Street Ry. & Power Co.*, 79 Southeastern Rep., 844.)

### MISSOURI.—*Duty to Pay Fare First.*

A person has no right to remain on a street car without paying his fare when asked to do so by the conductor, or to tender the fare only on condition that a transfer is to be issued, even though he is legally entitled to such transfer. (*Green vs. United Rys. of St. Louis*, 206 Southwestern Rep., 237.)

### NEW YORK.—*Injury Arising Out of Employment Under Workmen's Compensation Act.*

An elevated railway guard having two hours off, who stayed on the train to ride to the office for pay and thence to a dentist, and was injured in a collision, was not within the workmen's compensation act, and could recover in a civil action. (*Pierson vs. Interborough Rapid Transit Co.*, 172 New York Sup., 492.)

## New Publications

### The Fusibility of Coal Ash and the Determination of the Softening Temperature

By A. C. Fieldner, A. E. Hall and A. E. Field. Bulletin 129 of the United States Bureau of Mines, Washington, D. C. One copy free from the Bureau of Mines, extra copies 20 cents each from the Superintendent of Documents, Government Printing Office.

A very complete, scientific and practical treatise on the subject, containing not only the laboratory methods of procedure but also many data obtained from experiments.

### Arbitration and Wage-Fixing in Australia

Research Report No. 10. National Industrial Conference Board, 45 Beacon Street, Boston, Mass. Sixty pages. Paper, \$1.

This explains how state regulation of wages and of industrial disputes has become firmly established as a public policy in Australia. Australian experience, it is said, clearly establishes the value of conciliation and of some form of arbitration as a means of reducing industrial friction.

### Economical Operation of Steam Turbine Electric Stations

By C. T. Hirschfeld and C. L. Kerr. Technical Paper No. 204. United States Bureau of Mines, Washington, D. C. One copy free from Bureau of Mines; extra copies

5 cents each from Superintendent of Documents, Government Printing Office, Washington, D. C.

This little pamphlet should be put into the hands of every intelligent power-plant employee. It is non-mathematical in style, and especially in these times of expensive fuel will conduce to more careful power plant operation.

### The Eight-Hour Day Defined

Research Report No. 11, National Industrial Conference Board, Boston, Mass. Ten pages, 50 cents.

In this report, which is one of a series issued monthly by the board, a clear distinction is drawn between the purposes and effects of the straight eight-hour day and the basic eight-hour day. The former discourages and usually prohibits overtime; the latter allows it and even encourages it, so far as the workers are concerned. The two are therefore diametrically opposed to each other. No opinion is expressed as to what constitutes the proper number of hours for a working day.

### Uniform System of Accounts for Electric Railroad Corporations

Public Service Commission for the Second District of N. Y., Albany, N. Y.

This 143-page pamphlet gives the complete text of the uniform system of accounts for electric railways which became effective on Jan. 1, 1919. The classification is an adaptation of the uniform Interstate Commerce Commission classifications, with certain modifications for use in New York. In most cases the difference lies in subdivision of the Interstate Commerce Commission accounts.

It is worthy of particular mention that depreciation accounts for way and structures, equipment, power-plant buildings and power-plant equipment are provided, and while each corporation may determine for itself the amount to be reserved annually, the commission will "necessarily, in deciding rates and other cases, have to pass upon the adequacy or the inadequacy of such charges."

In this connection the commission suggests that a depreciation charge amounting to not less than 2 per cent or more than 5 per cent per annum on the average cost of all ways and structures or to not less than 2 per cent or more than 10 per cent per annum on the average cost of all equipment will under normal operating conditions be generally less open to question than rates which fall above or below these limits. It also suggests that depreciation rates be stated in terms of a percentage of the cost of depreciable property, since this form of statement is on the whole believed to be the clearest and simplest way of expressing the normal depreciation charge and furnishes the readiest basis for comparison between companies. It is not necessary that separate reserves shall be set up for each unit of depreciable property or even for each separate class of property owned by a corporation.

## Personal Mention

J. A. Martin has been elected president of the Cheyenne (Wyo.) Electric Railway to succeed A. T. Young.

O. E. Grim has been appointed chief engineer of power station of the York (Pa.) Railways to succeed L. J. Freed.

F. M. Fritchman has been elected president of the Indiana County Street Railway, Indiana, Pa., to succeed James B. Phelan.

Sedgwick Kistler has been elected president of the Susquehanna Traction Company, Lock Haven, Pa., to succeed Jacob Scott.

G. McCabe has been appointed claim agent of the Seattle & Rainier Valley Railway, Seattle, Wash., to succeed John C. Higgins.

E. H. Derricott has been appointed secretary and treasurer of the Lethbridge (Alta.) Municipal Railway to succeed D. Donald.

Bert Gray has been appointed claim agent of the Galveston-Houston Electric Railway, Galveston, Tex., to succeed C. B. Fisher.

W. E. Pearson has been appointed auditor of the Lackawanna & Wyoming Valley Railroad, Scranton, Pa., to succeed H. E. Yost.

Harry Croyle has been appointed chief engineer of power station of the Johnstown (Pa.) Traction Company, to succeed Norris Orms.

Mary R. Armstrong has been appointed treasurer of the Susquehanna Traction Company, Lock Haven, Pa., to succeed Jacob Scott.

Paul Stark has been appointed auditor of the Eastern Wisconsin Electric Company, Sheboygan, Wis., to succeed William E. McGovern.

O. S. Lamb has been appointed superintendent of the Union Depot Bridge & Terminal Company, Kansas City, Mo., to succeed C. C. Sherk.

Emil Albe has been appointed engineer of power station of the Milwaukee Northern Railway, Cedarburg, Wis., to succeed Harry Shaver.

W. H. Bathinay has been appointed purchasing agent of the Walla Walla Valley Railway, Walla Walla, Wash., to succeed W. N. Voegtly.

W. B. Trier has been appointed assistant auditor of the Eastern Wisconsin Electric Company, Sheboygan, Wis., to succeed Simon Kurtz.

George W. Kuntz has been appointed purchasing agent of the Northwestern Pennsylvania Railway, Meadville, Pa., to succeed F. C. Yockey.

Ed Jacobs, son of the late W. B. Jacobs, the founder of the Shreveport (La.) Railways, has been elected secretary of that company.

E. A. Roehry has been appointed general superintendent of the Cairo

Railway & Light Company, Cairo, Ill., to succeed W. F. Crossley.

L. Coatsworth has been appointed purchasing agent of the Chicago & Interurban Traction Company, Chicago, Ill., to succeed C. S. White.

E. E. Smith has been appointed claim agent of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., to succeed C. R. Innis.

C. E. Gilmore has been appointed a member of the Railroad Commission of Texas, effective about Jan. 15, 1919, to succeed C. H. Hurdleston.

Harold A. Crane, who has been treasurer of the Connecticut Valley Street Railway, Greenfield, Mass., since February, 1916, has resigned.

W. H. Pickard has been appointed auditor of the Jamestown, Westfield & Northwestern Railroad, Jamestown, N. Y., to succeed A. B. Crossley.

E. W. York has been appointed chief engineer of power station of the Citizens' Traction Company, Oil City, Pa., to succeed Charles Monks.

E. B. Smith has been appointed purchasing agent of the Monongahela Valley Traction Company, Fairmont, W. Va., to succeed A. T. Watson.

M. Leahy has been appointed superintendent of overhead construction of the United Traction Company, Albany, N. Y., to succeed L. Calligan.

F. W. Potts has been appointed treasurer of the Lackawanna & Wyoming Valley Railroad, Scranton, Pa., to succeed H. C. Kochersperger.

A. C. Crandall has been appointed claim agent of the Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis., to succeed J. W. Graham.

Ralph Fox has been appointed master mechanic of the Monongahela Valley Traction Company, Fairmont, W. Va., to succeed George H. Hudson.

Robert E. Williams has been appointed chairman of the State Corporation Commission of Virginia to succeed Christopher B. Garnett.

E. Watson has been appointed purchasing agent of the Reading Transit & Light Company, Reading, Pa., to succeed H. H. Reigel, resigned.

H. B. Stufflehead has been appointed purchasing agent of the Nashville Railway & Light Company, Nashville, Tenn., to succeed J. M. Davidson.

E. W. Gross has been appointed treasurer of the Seattle & Rainier Valley Railway, with headquarters at Chicago, Ill., to succeed Edgar Peck.

J. M. Luna has been appointed a member of the State Corporation Commission of New Mexico, effective Jan. 1, 1919, to succeed M. S. Groves.

C. C. Cash has succeeded E. H. Recheberger as auditor and assistant treasurer.

urer of the Northwestern Ohio Railway & Power Company, Toledo, Ohio.

C. C. Hogshead has been appointed chief engineer of power station of the Roanoke Railway & Electric Company, Roanoke, Va., to succeed E. C. Barnes.

Jesse B. Kremer has been appointed secretary and treasurer of the Shamokin & Edgewood Electric Railway, Shamokin, Pa., to succeed Manfred H. Barr.

A. E. Patterson has been appointed roadmaster of the Montreal & Southern Counties Railway, with headquarters at St. Lambert, to succeed W. H. Maxwell.

J. E. Shinn has been appointed superintendent of power of the Lehigh Valley Transit Company, Allentown, Pa., to succeed Howard H. Duff, deceased.

William Milnes has been elected vice-president of the Frankfort, Tacony & Holmesburg Street Railway, Philadelphia, Pa., to succeed C. Bradford Fraley.

Winthrop Coffin, Brookline, has been nominated by Governor Coolidge of Massachusetts as a trustee of the Boston Elevated Railway to succeed Galen L. Stone, resigned.

C. S. Johnson has been appointed secretary of the Vicksburg Light & Traction Company, Vicksburg, Miss., to succeed I. C. Elston, who has been elected president of the company.

F. E. Lyons was appointed claim agent over the lines of the New York, Westchester & Boston Railroad, New York & Stamford Railway and the Westchester Street Railroad of White Plains, effective on Jan. 1.

P. H. Gadsden, president Charleston Consolidated Railway & Lighting Company, Charleston, S. C., has been appointed a member of a committee of three of the Chamber of Commerce of the United States to further the plan of a League of Nations. The other members are Edward A. Filene, Boston, and George E. Roberts, New York.

H. J. Dressel has resigned as superintendent of transportation of the New Orleans Railway & Light Company, New Orleans, La. Mr. Dressel has been connected with the company for more than twenty years. The duties of the office of superintendent of transportation have been transferred to Nelson H. Brown, manager of the railway department.

H. J. Jumonville, formerly auditor of the New Orleans Railway & Light Company, New Orleans, La., and more recently auditor of the American Cities Company, with headquarters at New Orleans, has been appointed manager of the office opened on Feb. 1 in New Orleans by Haskins & Sells, certified public accountants, New York. Mr. Jumonville was born on July 29, 1879. He entered business with the Edison Electric Company, New Orleans, in 1896. All of his business career up to the present time has been with public service corporations.

John S. Bleecker, manager of the operating companies for Stone & Webster at Columbus, Ga., which includes the Columbus Railroad, has been appointed general manager of the New Orleans Railway & Light Company, New Orleans, La., by J. D. O'Keefe, receiver of that company. This is a new office with the company at New Orleans. All of the present departmental heads of the corporation will, it is announced, continue with the company, Mr. Bleecker assuming general charge of operation under Mr. O'Keefe. As at present organized, the company has separate managers for its railway and light departments. Mr. Bleecker has long been connected with Stone & Webster. He was born in Washington, D. C., on April 8, 1878. He is the son of Rear Admiral J. V. B. Bleecker, United States Navy. Mr. Bleecker was graduated from the English High School at Boston, Mass., in 1894 and from the Massachusetts Institute of Technology



J. S. BLEECKER

in 1898. He was employed in the mechanical department of the American Bell Telephone Company at Boston immediately after graduation and remained with that company until 1900, when he entered the service of Stone & Webster Engineering Corporation. In the interests of this large holding system he has filled various positions at Boston, Seattle, Houghton, Blue Hill, Paducah and Columbus, the duties covering a very wide range of activity.

W. E. Coman, vice-president and general manager of the Northwestern Electric Company, Portland, Ore., has been elected vice-president and general manager of the Washington Water Power Company, Spokane, Wash., to succeed Harry L. Bleecker, deceased. He will assume his duties at Spokane about March 1. Mr. Coman is one of the best known electric lighting and power men in the Northwest. He began his career as a clerk with the Oregon-Washington Railroad & Navigation Company. He rose quickly in the freight department through his grasp of transportation essentials and was made in succession chief freight clerk, assistant general freight agent and then general freight agent of the merged Harriman

line. In 1910 the new Spokane, Portland & Seattle Railway opened with Mr. Coman as its general freight and passenger agent. In 1912 he accepted the position of vice-president and general manager of the new Portland power company, the Northwestern Electric Company.

Frank H. Swan, appointed receiver of the Rhode Island Company, operating all the electric railways in Rhode Island, is the senior member of the law firm of Swan & Keeney, Providence. The firm was established in 1916, and for eleven years prior to that time Mr. Swan had been a member of the firm of Edwards & Angell, one of the most widely known law firms in the State. The receiver was born in Windham, Me., forty-five years ago. He received his primary education at Friends School, now the Moses Brown School, Providence, and was graduated from Bowdoin College, Me., in the class of 1898. He entered Boston University and completed the law course at that institution in 1901. After leaving Boston University Mr. Swan took up the practice of law in Portland, Me., and was chosen city solicitor of Westbrook, a city about 5 miles from Portland. He then served as assistant to United States District Attorney Isaac Dyer at Portland for three years, following which he removed to Providence. Mr. Swan has had extensive experience in corporation law and has specialized in public utilities.

Gardner F. Wells, who has until recently been manager of the division of transportation of the United States Housing Corporation, has resigned to enter the consulting engineering field with particular reference to public utilities. For fifteen years, from 1901 to 1916, Mr. Wells was with Stone & Webster. For the first five years of this period he was engaged in property management and in engineering and construction work. For the remainder of the time he was an appraisal expert, making office and field examinations and preparing reports and appraisals of public utilities. This work covered the entire country and included the public utility properties belonging to the New York, New Haven & Hartford Railroad. Before joining Stone & Webster Mr. Wells spent ten years with the Thomson-Houston and General Electric Companies on engineering, construction and management work in connection with electric railway and other utility properties, going with the first-named property from the Massachusetts Institute of Technology where he spent a year in engineering study. Since March, 1916, he has been head of the corporation bond buying department of Arthur Perry & Company, Boston, and during the war period served first as major in the Ordnance Department of the army and later joined the staff of Otto M. Eidlitz, head of the government Bureau of Industrial Housing and Transportation.

# Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,

SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

## White-Cedar Pole Business Outlook

Slow Readjustment of Values to Follow Price Changes for Commodities Used by Producers

The twenty-third annual meeting of the Northern White Cedar Association was held at the Hotel Radisson, Minneapolis, Minn., on Jan. 20, 21 and 22. In his address President Gerich said:

"The year 1919 will develop a readjustment of values much greater in some commodities than in others. Our industry should work with cautious optimism, knowing its cost, watching its expenses, and it would seem to me that with a gradual readjustment of values, not only of our own products but of those we use so heavily in producing poles, the cedar industry should have a gratifying peace future of prosperity."

Among other topics discussed by the various committees and the delegates were the railroad freight rates, insurance, the labor situation and the substitution of metal and other commodities for forest products.

The following officers were elected for the ensuing year: President L. L. Hill of the Page & Hill Company, Minneapolis; vice-president, L. A. Furlong of the Valentine-Clark Company, Minneapolis; treasurer, W. B. Thomas of Manistique; secretary, H. B. Boucher of Minneapolis; directors, F. Finch of Duluth and M. J. Bell of Minneapolis.

## Paints and Varnishes Quiet

Consuming Trade Shows Little Activity—Drop in Price of Materials Brings Slight Improvement

At this time of year traction companies might well consider the question of the application of paint, enamel and varnish to rolling stock. Probably never before in the history of the electric railroads have cars gone so long without attention of this character as they have in the last four years. It is true that the materials entering into the manufacture of paints, enamels and varnishes have been scarce and high in price, but now their supply is ample and prices have begun to decline.

The consuming trade is disposed to hold back as much as possible waiting for lower prices, but the possibilities of quoting very much lower prices on the finished product are not as yet presented by any material decrease in the costs of production. There has been a gradual yet steady improvement in the situation, however.

The manufacturers of brushes are having considerable difficulty in securing materials, and say they cannot see how prices can very well be lower.

The reductions in price of containers, both tin and wood, are so slight as to have little appreciable effect on the price of the delivered covering material.

## Bituminous Coal Output Falling

Anthracite Production, However, Still Showing Gain—Daily Average Shows Increase for Coal Year to Date

A considerable decrease occurred in production of bituminous coal during the week ended Jan. 25, the output declining to the low level of 9,159,000 net tons, according to the regular weekly report of the Geological Survey. This production which falls approximately 750,000 net tons below the preceding week, and approximately 1,000,000 net tons below the corresponding week of last year, is at the rate of 475,000,000 net tons per annum and is considerably below present consumption.

Many consumers are now using coal accumulated during last summer, and the present good weather enables certain consumers to await the outcome of the raising of the zone and price restrictions by the United States Fuel Administration before placing their orders.

The daily production of bituminous coal during the current week estimated at 1,526,000 net tons is 19 per cent below the daily average for the coal year to date and 13 per cent behind the daily average for the same period of last year. The total production for the period April 1 to Jan. 25 is now estimated at 485,656,000 net tons and is 34,855,000 net tons or 7.7 per cent in excess of last year's production for the same period of time.

The production of anthracite increased considerably during the week ended Jan. 25, and was slightly in excess of the average weekly production for the coal year to date. Preliminary estimates place production of anthracite for the current week at 1,886,000 net tons as against 1,786,000 net tons during the week of Jan. 18, and as against 1,719,000 net tons during the week of Jan. 25, 1918. The daily average during the current week, estimated at 314,000 net tons, is a slight increase over the daily average for the coal year to date, and but 3000 net tons, or 1 per cent behind the daily average for a similar period of last year.

## Conditions in Track Supplies Market

Drop in Price Noted On Standard Hardware, But Track Specialties and Ties Unchanged

So much labor is figured in the production of crossings, frogs, switches, etc., that the price of these track specialties has not decreased recently.

Standard track hardware has, however, shown some changes since the signing of the armistice, railroad spikes have come down from 4.5 cents to 3.9 cents per pound, while screw spikes hold at 8 cents. One quarter of a cent has come off the previously reported 31 cents for tie plates, both flat and brace, fish plates, angle plates and angle bars, while tie rods have held at 7 cents. Rail bolts and nuts continued at 4.9 cents per pound, while steel bars have dropped from 2.9 cents to 2.7 cents.

The supplying of cross-ties for steam roads has been taken out of agents' hands. It is reported that the government regional directors in the different sections of the country issue bulletins stating the price they will pay for ties delivered on their right-of-way, this price being in general higher than that which agents would have stated. However, a good maintenance business has been carried on with the electric lines.

Most of the Southern tie camps were worked by negroes. So many of these laborers have been taken into service that production has been materially curtailed. There has been no change in price reported.

## Fare Boxes and Registers Especially Active

Many Traction Companies Taking Steps to Safeguard Income—Jitneys Required to Register Fares

A very active field, both during the war and since the armistice, has been found to exist for fare boxes and fare registers. With the increase in price of all railway maintenance equipment, traction companies apparently have realized the safeguarding of every cent of income to be a most important item.

The increased operating and maintenance expenses were in many cases met by increased fares, either straight increases or the adoption of the zone system. In either case accurate collection and registration of fares was sought in order to safeguard the traction company not only through its employees but also through the traveling public.



Many cities are requiring jitneys operating within their limits to accurately record all fares received from passengers, so that a certain return can be made to the city based on the number of fares paid. The cities in many cases are co-operating with the jitneys in this matter in that the necessary equipment is being bought by the city and sold to the jitney owners on the installment plan.

## Copper Drops to 18½ Cents

Action of Big Producers Brings Market to Life with 7,000,000 Lb.

### Buying

Copper was offered Thursday by the big producers at 18½ cents a pound, a reduction of 4½ cents a pound from the 23-cent level which prevailed after the first of the year when the government price fixing ended. The 23-cent price was quoted for foreign trade by the Copper Export Association and thereupon became the price at which the producers held the metal for domestic trade. The price of 23 cents brought little or no buying into the market and the industry was stagnated with the copper mined piling up as a big surplus.

The smaller producers have, for the last week, been selling copper at 18½ cents and on Wednesday the large producers began offering the metal at the same figure.

John D. Ryan, chairman of the board of the Anaconda Copper Mines Company, declared that the action of some of the companies in cutting the price had cleared the copper situation to some extent at least. He said that he felt more confident about the situation now than he had before, and declared that a "substantial market" had been opened by the price cutting action.

The immediate effect of the cut was the bringing about of sales of approximately 7,000,000 lb. of copper or more than six times the volume of sales of any day in January.

It was asserted that, relatively speaking, demand was lacking. The fact that actual sales were being consummated however was taken as a hopeful sign by some observers.

## New Process Gear Corporation Changes Hands

John N. Willys has purchased outright the New Process Gear Corporation of Syracuse, N. Y., taking over all of the \$3,000,000 capital stock of the concern. There is no change contemplated in the nature of the product the company will manufacture, although it is naturally expected that material expansions in the old field will result. It is the intention of the company to solicit gear business of all kinds, and particularly in so far as the manufacture of gears relates to differentials and transmissions for the automobile trade. Thomas W. Meachem and other members of the Meachem family connected with the corporation

have retired, having sold their interests to Mr. Willys. On the latter's part this step represents complete acquisition of a plant in which he previously had been partially interested. No change of active management has been intimated, immediate control of the enterprise being in the hands of J. Allan Smith. The new officers of the company are: J. N. Willys, chairman; J. Allan Smith, president; J. E. Keppeler, vice-president; C. A. Neracher, vice-president; E. J. Quintal, treasurer and assistant secretary.

## Rolling Stock

Denver & Interurban Railway, Denver, Col.—Fort Collins branch, has just been taken over by the city of Fort Collins. W. B. Cheek, city engineer, has written that the old cars, although in excellent shape, are considered too heavy for local conditions and will be sold, light-weight cars to be operated in their place.

Brocklyn (N. Y.) Rapid Transit Company is placing an order for fifty center-entrance trail cars with the J. G. Brill Company, Philadelphia, Pa. The dimensions and specifications for these trail cars are the same as those given in the ELECTRIC RAILWAY JOURNAL for July 8, 1918, referring to an order for fifty of these cars placed with the Jewett Car Company. This latter order has not been filled.

San Francisco-Oakland Terminal Railways, Oakland, Cal., in addition to the ten cars purchased from the Street Railway Company at Spokane, Wash., as noted in these columns of Nov. 12, and the ten steel center entrance trailers under construction in their own shop, as noted in these columns of Sept. 28, is reconstructing thirteen old California type open cars, the first of which is in operation.

## New Advertising Literature

Wayne Oil Tank & Pump Company, Fort Wayne, Ind.: Booklet dealing with storage and distribution systems for oils, varnishes, gasoline.

Ajax Metal Company, Philadelphia, Pa.: Two booklets, "A Text Book on Babbitt Metals" and "A Text Book on Ajax Ingots." The first tells the way to pick the right babbitt, how to pour babbitt, etc. The second gives interesting facts of the methods of producing and using Ajax ingots.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Reprint No. 71, "The Advantages of Railroad Electrification"; Reprint No. 73, railway motors, acceleration of cars and economical car operation; Reprint No. 74, "Dipping and Baking"; Reprint No. 75, "Trolley Transports"; and Reprint No. 77, "The Success of the Safety Car."

## Trade Notes

C. N. Barney, 115 Broadway, New York City, has been appointed to act as local representative for the Worthington Pump & Machinery Corporation.

C. F. Lamont has recently been released from the navy and resumed his position as Northern representative of the Electric Service Supplies Company, Chicago, Ill.

G. H. Knutson, member American Society of Civil Engineers, who, for the last eight years, has been a partner in the Fargo Engineering Company, consulting engineers, Jackson, Mich., is now associated with the corporation department of the Harris Trust & Savings Bank of Chicago.

Roller-Smith Company, New York City, has appointed Frank R. Ryan to the sales force of its Chicago office in place of C. H. Nicholson, now in charge of the Detroit office. Mr. Ryan has been with the Commonwealth Edison Company, the Krehbiel Company, and the United States Signal Corps.

H. W. Johns-Manville Company is reported to have purchased a tract of 255 acres on the lake shore at Waukegan, Ill., upon which it intends to construct a three-million-dollar plant to manufacture asbestos and magnesia products. The plant is to have a capacity of 35,000 cars yearly, and it is understood that it will employ 2500 to 3000 people.

Ohio Brass Company, Mansfield, Ohio, states that prior to the signing of the armistice the mill supplying brass for O-B extruded trolley ears was so loaded up with government orders that commercial orders were virtually unobtainable. The situation is now, however, clearing up rapidly and the company states that the usual stock shipments of extruded ears can now be expected.

Paul Campbell has been appointed factory manager of the Electric Service Supplies Company of Philadelphia, Pa. Previously he was production manager for James Cunningham Son & Company of Rochester, N. Y.; and superintendent of the F. B. Stearns Company, of Cleveland, Ohio, where he originated the manufacturing methods used in the first successful commercial production of the "Silent-Knight" motor car in America.

P. W. Jenkins, lieutenant, U. S. N. R. F., has been appointed manager of railway sales of the American Rolling Mill Company, effective Jan. 4. Previous to the entry of the United States into the European war, Mr. Jenkins was in charge of sales of castings and forgings for this company. When the war broke out he was given indefinite leave to re-enter the navy from which he had resigned in 1913. Lieutenant Jenkins served as an engineering officer on a navy transport throughout the war. Upon cessation of hostilities he was released from active duty.

### Franchises

Quincy, Mass.—The Massachusetts Highway Service Company has asked the City Council of Quincy for a franchise to operate a trackless trolley line in Quincy from the Braintree line along Quincy Avenue to the Fore River plant, thence into the housing development.

Trenton, N. J.—The Trenton & Mercer County Traction Corporation has asked the City Commission of Trenton for an ordinance to extend its West State Street line through the tunnel under the Delaware & Raritan Canal to a connection with the Trenton Junction line and also for permission for the removal of its tracks along Sullivan Way.

Buffalo, N. Y.—In order to relieve congestion in the downtown section of the city and comply with an order of the Public Service Commission for the Second District of New York, the International Railway has applied to the City Council of Buffalo for permission to lay a single-track loop around the Soldiers' and Sailors' monument in Lafayette Square, together with the necessary switch tracks in Washington Street. It is planned to turn back several east side car lines at Lafayette Square instead of operating the cars over the Washington Street route through the badly congested heart of the retail shopping district. The City Council will investigate the situation, but it is believed the franchise will be issued.

### Track and Roadway

Chickasaw Utilities Company, Birmingham, Ala.—After July 1, the Chickasaw Utilities Company, a subsidiary of the Chickasaw Shipbuilding Company, will take over, maintain and operate its own car line between Prichard and Chickasaw, with current from its own station now under construction. The line is now operated under contract by the Mobile Light & Railroad Company, George Gordon president.

Montgomery Light & Traction Company, Montgomery, Ala.—Repairs and improvements have been begun by the Montgomery Light & Traction Company on its street railway system and cars.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—As soon as weather conditions permit, the San Francisco-Oakland Terminal Railways will reconstruct its tracks on Telegraph Avenue south of Fortieth Street, at a cost of \$104,635.

United Railroads of San Francisco, San Francisco, Cal.—The Board of Supervisors of San Francisco has approved the expenditure of \$45,000 by the United Railroads of San Francisco for the reconstruction of the company's tracks on Taraval Street, between Twentieth and Twenty-third Avenues.

Kensington (Md.) Railway.—A report from the Kensington Railway states that it will probably construct a 3-mile extension to North Sandy Spring during 1919.

Columbus Railway, Power & Light Company, Columbus, Ohio.—Plans are being made by the Columbus Railway, Power & Light Company to improve its tracks on High Street, from Poplar to Fifth Avenues; Broad Street, from Anson to Sandusky Streets; Third Street, from Naghten Street to Livingston Avenue; Main Street, from Allen Street to Alum Creek; Goodale Street, from High to Henry Streets and Livingston Avenue, from High Street to Parson Avenue.

Evansville & Ohio Valley Railway, Evansville, Ohio.—The lines of the Evansville Railway, recently taken over by the Evansville & Ohio Valley Railway, will be improved and extended during the coming summer. The extension from Henderson to Owensboro, which has been surveyed, will be pushed to completion. The company will form a subsidiary company to erect a traction and wagon bridge across the Ohio River, provided the necessary bill is passed by the Legislature.

Grand Trunk-Wabash Railway, St. Thomas, Ont.—It is reported that the lines of the defunct London & Lake Erie Traction Company between Thomas and Lake Erie are being reconstructed and operation will soon be begun by the Grand Trunk-Wabash Railway.

Dallas, Tex.—The construction of an electric interurban line from Dallas to Wichita Falls, a distance of about 180 miles, is being advocated by business men of both cities and of the towns along the proposed route. The development of the oil fields about Wichita Falls is one of the chief reasons for the proposed interurban line. Several routes have been proposed, but the one most favored would touch the following towns: Carrollton, Lewisville, Denton, Decatur, Alvord, Sunset, Bowie, Bellevue, Henrietta and Wichita Falls, and scores of smaller towns along the route. The proposition is being supported by J. F. Strickland, president of the Texas Electric Railway, the Dallas Railway and other traction and electric light and power interests in Texas; C. W. Hobson, general manager of the Southwest General Electric Company; J. A. Kemp and Frank Kell of Wichita Falls, and by other business men of Dallas and other cities in this part of the State.

Virginia Railway & Power Company, Richmond, Va.—Rails are being distributed by the Virginia Railway & Power Company on Liberty Street and Berkley Avenue, Berkley, for the double-tracking and rerouting plan which is to be put into effect early in the spring. The line on Liberty Street will be double-tracked and a single-track line will be laid on Berkley Avenue. The tracks on Pearl, Walnut, Clifton, Patrick, Second Streets and Walker Avenue, will be taken up.

### Power Houses, Shops and Buildings

San Francisco-Oakland Terminal Railways, Oakland, Cal.—A new car overhauling shop has been completed by the San Francisco-Oakland Terminal Railways at a cost of \$10,455.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md.—Application has been made by the Washington, Baltimore & Annapolis Electric Railroad to the Public Utilities Commission of the District of Columbia for permission to construct a terminal station in Washington. The site is adjacent to the line of the company at New York Avenue between Eleventh and Twelfth Streets Northwest. The proposed building will have larger waiting rooms, ticket offices, baggage rooms, etc., than those in the present station at New York and Fourteenth Streets.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The Trenton & Mercer County Traction Corporation is constructing two additional repair pits at its carhouse on Lalor Street and has just completed a new slate roof on the building at a cost of \$12,000. The company has also contracted for a grinding machine to be used in grinding the flat parts of car wheels.

Sand Springs Railway, Tulsa, Okla.—A report from the Sand Springs Railway states that it will construct a new station building at Tulsa during the present year.

Peterboro (Ont.) Street Railway.—The Hydro-Electric Power Commission of Ontario, which operates the Peterboro Street Railway, advises that it proposes to construct a new 1500-kw. rotary substation.

Seattle, Wash.—The Light Department has asked for the sale of \$750,000 in bonds out of the total issue of \$1,755,000 authorized last fall to provide for the following construction work during the present year: Substation on Spokane Street at Whatcom for the purpose of operating the elevated railway, to cost \$165,000; completion of Ballard substation to furnish electricity to the northwest part of the city and to operate the north end of the municipal railway, \$30,000; for strengthening the present distributing system, \$50,000; for general construction work within the city limits, \$100,000; for completing sealing operations at the Cedar River dam, \$200,000; construction of a new 6-ft. pipe line from the dam to the power house at Cedar River, \$125,000; for an interconnection with the lines of the Puget Sound Traction, Light & Power Company, \$75,000. The remainder of the \$1,755,000 will be expended during the next three years in building a substation at the north end costing about \$250,000 and another at the south end, to cost about \$200,000, and in other additions to the lighting system to take care of the power to be secured from the Skagit project.