

Electric Railway Journal

Consolidation of *Street Railway Journal* and *Electric Railway Review*

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Rigid Periodical Inspection Should Be Insisted Upon

THE evils of haphazard inspection, of inspection which is not thorough and rigid, was brought forcibly to attention the other day while details of a certain truck were being examined. One of the motor bearings had collapsed and broken and was on its way out of the housing in pieces. It was caught just in the nick of time by the accident that this particular truck, out of a large number, was selected to be removed for the study being made. Most properties, and this one is doubtless no exception, have a regular schedule for inspection, but since inspection is by human beings, mistakes will be made.

In this case, something was overlooked which points to the necessity of equipment superintendents and master mechanics insisting upon not only periodical inspection but rigid and thorough inspection. The mechanical side of the economies and safety of operation of rolling stock is up to the equipment men. Constant inspection to catch every fault before it becomes serious is the basis of this part of the business. This also emphasizes to the executive the value of a well trained engineer in charge of the equipment. He is always worth more than most companies can afford to pay him.

How Some Proposed Taxation Would Affect the Industry

ONE of the questions which the present Congress will have to settle is that relating to future taxation. A repeal of the excess profits tax seems to be generally demanded, partly because of its complexity and partly because, with present business conditions, it is so much less productive than during the hectic years of business ended by 1920. In its place the substitutes principally recommended have been the sales tax, an increase in the normal tax, as levied on corporations or individuals or both, and a modified tax on corporation profits.

Various forms of "sales tax" have been suggested, but a common form, if not the most common form, provides a tax of 1 per cent each time the merchandise is sold, whether in the course of the manufacture of manufactured articles, or in the course of the distribution of merchandise among wholesalers, jobbers and retailers. Thus, in any merchandise which passes through several hands, the tax would be added each time, but some of the advocates of the sales tax have estimated that this cumulative tax would not amount to more than an average of about $3\frac{1}{2}$ per cent on the cost of the article to the ultimate purchaser. It is generally expected also that the tax would not be laid on sales of certificates of ownership, such as stocks, bonds or notes, or on payment for services, either personal or those furnished by utilities, or on sales of real estate.

The discussions on this tax at the recent meeting of the Chamber of Commerce in Atlantic City as well as discussions on the tax elsewhere have disclosed a con-

siderable diversity of opinion on its merits. Generally speaking, the tax has been favored by the financial, manufacturing and retail interests of the country with certain notable exceptions, however, and has been opposed by the agricultural and labor interests, and others who have proposed other taxes in its stead. This, in fact, is the position of Secretary Mellon, whose recommendations made public May 2 include increases in corporation taxes, increased stamp taxes and licenses for the use of automobiles.

As between the excess profits tax and the sales tax, the interest in the matter by electric railway companies so far has been largely academic. Very few electric railway companies have been affected by the excess profits tax, because they had no excess profits, and the nature of their services would exempt them from the sales tax as usually proposed. In fact, it would be impossible for the electric railways to collect from their patrons 1 per cent on a 6-cent or a 10-cent fare, and it is the understood purpose of the sales tax that it should be paid by the consumer.

The effect on electric railway companies of an increase in the normal tax or of an added corporation tax on net profits would depend entirely on the form and extent of the latter tax. The most serious possibility would be any considerable tax on undivided surplus. No matter what one may think of the principle of taxing the undivided surplus of ordinary corporations, such a policy if applied to the utilities would be detrimental, both to them and the public. It is only by the use of this surplus to finance essential improvements that many companies during recent years have been able to serve their growing communities at all adequately. From one point of view such a policy has been hard on the stockholders, but they have had the satisfaction of knowing that their property was continuing to fulfill its public functions and that, in some critical cases, this plan was better than to borrow money for extensions at the very high interest rates which would have to be paid for it during these abnormal times.

Should Periodical Re-examinations of Employees Be Held?

IN THE issue of this paper for Dec. 18, 1920, there was an editorial reference to the necessity for physical and mental examination of prospective employees. This was in connection with a forthcoming report of the committee on personnel of the American Electric Railway Transportation & Traffic Association. Since that time some of the larger electric railway companies have extended the scope of such examinations with results so satisfactory that an "experience meeting" in connection with the next convention should help to impress on the railway representatives the importance of giving more attention to this feature of successful management.

It is an easy matter for a railway company to require all prospective employees to submit to a physical and

mental examination before entering the service. This affords an opportunity to weed out undesirables before they have come under the protection of a workmen's compensation act and without giving them a chance to endanger the lives of passengers. It is an entirely different matter to carry out a policy of re-examination of employees after they have been working for some time. This involves the question of what to do with an old employee who has been found wanting in some serious particular as to physical requirements. Shall he be carried on a pension roll, or transferred to some less hazardous occupation, or summarily dismissed?

Adherence to a high physical standard undoubtedly would be an advantage to the riding public, to the company and to the employee himself. But if in the carrying out of such a policy a workman faces discharge after twenty or thirty years of faithful service, it is worth while to consider what can be done. Few railway companies are sufficiently prosperous to be able to set aside an adequate pension fund for employees. In some cases where the employees are strongly unionized objection has been raised by their representatives to the establishment of a company pension plan. This probably is due to fear that the men would be won over to a company organization. The alternative plan of finding work for the disabled employee in some other department would be all right until all possible jobs were filled. The last alternative of dismissing the workman meets with objections from the humanitarian standpoint, yet it is one which will have to be faced in a serious recognition of the duty owed to the public of furnishing safe men as well as safe equipment. A defective wheel or brake would have to be discarded. What about the defective employee? The subject opens up a broad field for discussion.

Is It Better to Cut Wages in a Lump or By Installments?

THE Boston Elevated Railway employees have fallen in line with those of Cleveland in accepting without strife a decrease in their basic rates of pay. Conditions governing the decrease, which amounts in all to about 10 per cent, call for its being made in installments. For men on the surface lines in service more than one year, in other words for those in this class receiving the maximum pay, the hourly wages will be decreased 2 cents per hour on July 1 and 3 cents per hour additional on Jan. 1, 1922. This corresponds to a total reduction of 7.14 per cent from the present rate of 70 cents. Elevated motormen and guards have reductions of from 4 to 6 cents per hour, also in two installments of six months each.

It is this method of reduction which makes the Boston program of especial interest. Those who favor the plan will doubtless argue that the division of the reduction into two installments more easily permits the employee to adjust his scale of living to his income, hence that the plan is a wise one. Those opposed will probably declare that where a reduction in wages is no more than in the cost of living no adjustment by the employee in his scale of living is necessary. Such changes, they argue, should be definite for a definite time and future periods can very properly be cared for on their merits whenever there is a material change in living costs.

The more general practice of using the immediate settlement plan of adjustment seems to indicate its greater popularity among railway men. But this is not

conclusive, as it is not known that the installment plan was thought of and considered in other cases. It is worth examining.

Another interesting departure in wage agreements is the recent arbitration award in the case of the New York pressmen, handed down this week and accepted by both sides. This award calls for a reduction in wages of about 12 per cent and is made retroactive to April 1. Retroactive wage increases are common and there is no reason against retroactive reductions, but they are not frequent. The men expect to pay back the sum thus awarded by deductions from their payroll during May.

Philadelphia Co-operative Spirit Carries Down as Well as Up

THE present problem of effecting necessary reductions in wages, no matter by what detail it is actually carried out, places a test on the satisfactory nature of the relations of management to men on electric railway properties which is probably as severe as any which has ever been applied to this relationship. There has already been comment in these columns on some cases which have arisen, Cleveland being an outstanding one. Other recent cases are Altoona, Pa.; Albany, Ala.; Hudson, N. Y.; Saginaw, Mich., and Boston, Mass., commented on above. Another case of interest to the industry is Philadelphia, where wages have been determined according to contract with the men by averaging the rates in effect in Buffalo, Cleveland, Detroit and Chicago. The method of computing the Philadelphia wage is of course a mere mechanism and may be open to the criticism of "letting George do it," but it seems to have worked successfully.

The manner in which the men are reported to have accepted this reduction, voluntarily, is an indication, possibly, of their sense of partnership in the enterprise, certainly of the understanding of the necessity for and justness of the decrease. The way was paved for this present reduction, however, last summer when the last increase went into effect. Mr. Mitten warned the men at the time that this was all temporary and that they should consider the increase in income as "velvet" and store it away, not establishing a scale of living based on the new wage, for this was bound to come down soon.

Each property will develop its own relations in this respect largely as the result of the individual characteristics of the men on both sides. Indications are that these relations are improving all over the country, in spite of the strain on them caused by the past several years. Philadelphia's record of ten years of industrial peace, recently celebrated there at the tenth anniversary of the successful co-operative plan on the P. R. T., is one instance to prove this.

Has Paris Solved the "Incentive" Problem in Railway-City Contracts?

IT IS universally admitted that the most pressing problem before both the electric railway and its community today is to find a means of combining an attractive rate of return to the investor with a continued growth in the usefulness of the transportation system. The service-at-cost and public trusteeship plans are steps in that direction, but many of these agreements are thus far on the wrong side of the ledger and on the wrong side of the traffic count. If, then, the

present agreements do not look like the last word on the subject, what can we learn from those who have had longer experience with contracts of that kind?

Fortunately, a most interesting experience in this direction has come to hand through the changes now taking place in the Paris metropolitan district. Here contracts in which fares went up or down according to traffic density were made as early as 1910. However, it seems that they failed the public before the war in producing the expected enlargement and betterment of service and that they failed the company during the war in proving flexible enough to meet the situation in wages and materials, brought about by the war. Then, too, the division of the territory among six companies, although only one dominated Paris proper, was a hindrance to progress.

It is not necessary to set forth here the detail terms of the superseded contracts and the agreement with the new State-backed operating company, as these are presented elsewhere in this issue, but it is pertinent to see what weaknesses were disclosed during the operation of these early agreements. From the public's point of view, the weakness lay in the fact that the company's rate of return depended too closely upon a definite and undesirable density of traffic. Therefore, as a business proposition, the company hesitated to do anything which would impair this density of traffic, whether in extensions of routes or shortening of headways. From the company's point of view, conditions had reached the point where the rate of return was no longer insured by bearable increases in rate of fare. The mere relinquishment of the city's percentage of gross earnings would have been but a drop in the bucket.

The community, which includes the districts contiguous to Paris, therefore found it necessary to devise a plan whereby the profit possibilities of the transportation system would be made secondary to its usefulness. Obviously, private capital could not be expected to run a transportation system on that basis. On the other hand, direct government ownership and operation did not offer any definite guarantee of efficiency. So it comes about that the plan evolved is one which places the capital invested in the leasing company upon the same plane as a government bond and elevates the management and the employees to the position of supreme responsibility for results.

Now what are the results expected? Does the government expect that there shall necessarily be a surplus big enough to meet the cost of operation and all overhead, including the sinking fund payments to amortize the securities of the superseded companies and 6 per cent to the shareholders in the new company? No. The mark of efficiency will be primarily in enlarging the usefulness of the undertaking—in getting more riders; and secondarily in taking advantage of any improvements that will lower costs but not decrease service. The government frankly does

not expect that the most able management will be able to show a surplus for some years to come, but it is determined to make the transportation system as valuable to the community as possible without incurring extravagance. Hence there is seen a system of awards based upon both greater usefulness and technical progressiveness.

In sum, the outstanding features of this contract, in contrast with the usual service-at-cost plan, are that the rate of return will not have to come out of more revenue from less riders at higher fares, usefulness of the mass transportation system being predominant, and that a reward for attaining this enlarged usefulness will go to those whose brain and brawn are most closely responsible for results.

Use Judgment in Welding Reclamation

EVERY one knows of the great importance and value of welding in the reclamation of electric railway equipment. Welding has virtually saved the lives of many companies, both in its ability to keep the wheels turning and more permanently in the fine economies effected. During the war the inability often to get new equipment at any price justified the use of the welder to an extent that would not be considered good practice from the standpoint of either safety or economy in normal times. Times now are perhaps not normal, but conditions have eased sufficiently so that there is no longer any need to carry the reclaiming work to the extremes that were formerly necessary. The master mechanic particularly should check up on the welding work he is having done with two considerations in mind, namely, safety and cost. The more important of these is safety, for even though an economy may be shown it is inadvisable, at least with the present limited knowledge of the art, to weld at vital points such parts as car axles, flanges of wheels used in high-speed service and other parts that are subject to high strain and the failure of which might mean a serious accident.

The principal points of breakage of axles are between the gears and hub and between the journal bearing and hub of the wheel. These points are the vital points of a car axle, and as these parts cannot be increased in size above normal, because of the necessity for a machined finish at these points, it appears inadvisable to attempt welding repairs at such locations. Until there is more definite knowledge about the molecular effect of welding upon the metal greater caution may well be used.

While one's pride may be flattered by the statement that "we never scrap anything," still it is a very easy matter to be fooled about the relative economy of welding a broken or worn piece of equipment versus the scrapping and replacing it with a new one.

Quotation from the Federal Electric Railways Commission Report

No. 19

THE commission is not pessimistic as to the future. The electric railway problem admits of a satisfactory solution, once the elements that compose it are made known and the principles of ordinary economic and business common sense are applied.

The duty both of the public authorities and of those who control the electric railway enterprises of the country is plainly indicated. The time has come for stable and satisfactory settlements of traction difficulties.

The commission can go no further than to point out the principles upon which readjustment should be based. The task is really that of the state and local authorities upon the one hand and of the companies upon the other. Failure to rehabilitate the industry and the service is possible only if those upon whom the responsibility rests fail to undertake the work or pursue it in a spirit that makes settlement impossible.

The Baby Electric Railroad Is a Buster

Recently Electrified Short Railroad Line in Northeastern Oklahoma Immediately Proves Advantages of Electrification—Gives Excellent Freight and Passenger Service to Zinc and Lead Mining Communities—Contemplates Early Extension to Much Larger System

WHAT is probably the latest member to enter the electric railway field is the Northeastern Oklahoma Railroad Company, located in the northeastern corner of the State of Oklahoma and feeding what is probably the largest lead and zinc field in the world. As was noted three or four months ago in this paper, this railway started electrical operation about the first of February this year. It had previously been a steam road, which had been operating for about eight years, but whose service had been growing more and more unsatisfactory to the mining companies. During the latter part of 1919, in order to purchase the steam railroad property, the Northeast Oklahoma Railroad Company was formed, largely from mine operators and business men in Miami, the principal terminus and location of the main offices of the company. J. F. Robinson, president of the company, is also president of the Commerce Mining & Oil Company, the largest mining group in the Miami field. The road was formerly known as the Oklahoma, Kansas & Missouri Railroad.

The accompanying map gives some indication of the character of the layout of this road. The entire area shown on this map is practically as flat as a table top and twelve or thirteen years ago was Indian farm land of no particular importance. About 1911 lead and zinc were discovered and developed at and around Commerce, though there were some little developments north of that. It was at this time that the Oklahoma, Kansas & Missouri Railroad was started to handle the traffic from this new mining field to the St. Louis & San Francisco and the Missouri, Oklahoma & Gulf (now the Kansas, Oklahoma & Gulf) Railroads at Miami. During the world war the demand for lead and zinc caused a rapid expansion of this field, until at the close of the war there were some 280 lead and zinc mines operating here. Immediately these mining towns took on a new importance, for these are mining towns in the truest sense and remind one very much of the early days of Leadville, Cripple Creek and other centers of mining activity, busy with the creation of considerable new wealth. Practically all of these mines are located on land whose mineral rights have been leased from Indians, who hold title to the land under government supervision. Some of the Indians had fabulous incomes during 1917, 1918 and 1919, tales of \$20,000 to \$50,000 per month being

not unusual. The writer had the opportunity of going over this interesting territory in March to inspect the railroad and its community. Mining activity has, of course, now ceased in many of these mines and here lie the large groups of frame houses or shacks, practically all one-story in height, making up these mining towns, with populations which are ever variable.

Miami itself has a population of about 8,000 and North Miami of 600. This is rather stable population. If a normal figure can be set on the population of the other towns, it is about as follows: Commerce, 3,500; Tar River, practically a part of Commerce, 4,000; Picher, 10,000; Century, 1,500, and Treece, a town just above the end of the spur which reaches up into Kansas,

3,000. The officials of the road figure on a population of about 45,000 on the line and in the contiguous territory. From this, records show a passenger business of about 75,000 per month.

As this territory grew, the old steam road extended its lines to many of the mines, as did also the Miami Mineral Belt Railroad, which came in from the east to tap the field. This road also has connection with the Frisco and K. O. & G., as shown.



MAIN STREET, MIAMI, SHOWING CATENARY OVERHEAD WITH CONCRETE POLE CONSTRUCTION

The main office of the company and a passenger waiting room are in the large building in the foreground

Miami is a Western town which would surprise most people who have not been to Oklahoma. It has wide streets, 90 per cent of which are paved. It has excellent schools, is the home of one of the state mining schools, has one of the best hospitals in a radius of several hundred miles and is the trading center for a large area with which it is connected by excellent roads made from the chat which is the refuse from the lead and zinc mines. Mountains of this chat, by the way, surround each of the mines and give one the impression that the topography is not so flat after all. This chat, too, forms one of the sources of revenue for the company, for it can be secured and hauled away at very low cost for use in paving and in concrete work. Miami is also the home of a new industry of tripolite products, used for polishing purposes in the metal trade and also for facing casting molds. The great Krupp works in Essen, Germany, are said to secure their tripolite from the Miami field.

As to the road itself, the original equipment consisted of four steam locomotives, six passenger cars, used as trailers on the steam trains originally and retained as emergency trailers, and four General Electric

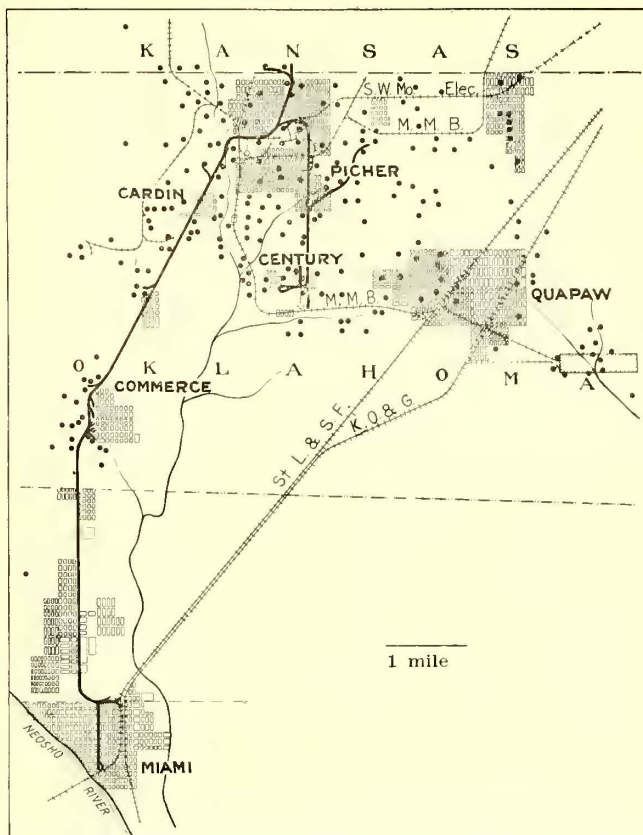
gasoline-electric passenger cars, in addition to freight equipment described later. The steam locomotives are being put into shape to sell, except that one will probably be held to operate work trains in case of making any extensions to the system, as planned, in the next five or six years. The four gasoline-electric passenger cars are also being repaired and overhauled for sale.

The entire system has been overhauled and track regraded and rehabilitated by the new management. The rail is standard 70-lb. rail on red and white oak ties, some of which are treated. The ballast is of the ever-present chat and averages a depth of 12 in. under the tie. The maximum grade in passenger service is 1.26 per cent; in freight, 1.05 per cent; the maximum curvature on the main line is $8\frac{1}{2}$ deg. and in yards 16 deg. All rail joints are bonded with 0000 strand bonds and cross-bonds of the same capacity are placed every thousand feet. The entire line is constructed on private right-of-way varying in width from 150 ft. at stations to 40 ft. at other points to suit conditions.

Necessary sidings, most of which are at least 1,500 ft. long; spurs, wyes, etc., were in the original layout or have been added so that the railroad can adequately take care of all necessary traffic.

The overhead, and all of the electrical work, is naturally new and has been added by the present management. The overhead construction, some illustrations of which are shown herewith, was designed by the Ohio Brass Company and is of the flexible catenary type. It is an example of how to put up overhead. The distribution scheme, with a substation at Picher and with one at Commerce, consists of a 500,000 circ.mil Roebbling feeder cable installed the full length of the main line electrification. A 0000 grooved trolley, hard-drawn copper, furnished by the Standard Underground Cable Company, forms the contact wire and is suspended from the catenary by hangers spaced 15 ft. apart. The feeder is attached to the trolley wire every 1,000 ft. and lightning arresters have been placed at this same spacing.

Western red cedar poles have been used, spaced 120 ft. on tangents, and on curves spaced to suit the curvature. These poles have been butt-treated, with hot application and then cold application, both brush applied. All poles are set 6 ft. in the ground, whether 35 ft. or 40 ft. in length. In the city of Miami, in place of wooden poles, reinforced concrete poles have been used both as a feature of artistic appearance and to give necessary strength. The transverse spans on Main Street, shown in one of the accompanying illustrations, are 60 ft. long, and in order to hold the overhead as rigidly as desired are under very heavy strain. The



MAP OF THE NORTHEASTERN OKLAHOMA COMPANY—THE ORE LINE (INDICATED BY HEAVY BLACK LINES)

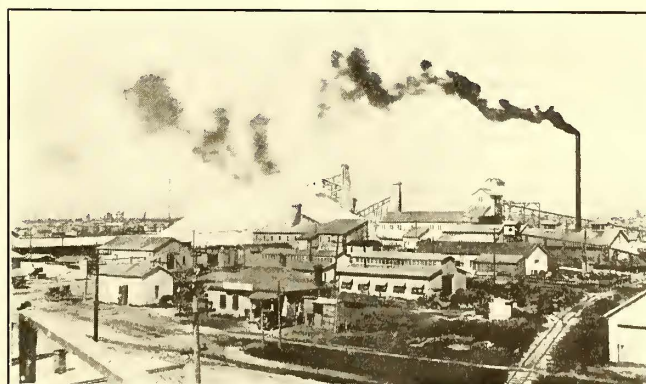
concrete poles used here are what are known as the 1,500 class furnished by the Massey Reinforced Concrete Products Company. They are 33 ft. long, with a 15-in. butt and 5-in. top, round, and reinforced the entire length with six longitudinal rods and also with annular rings of steel.

A telephone line runs the entire length of the main line of the road. To reduce interference to a minimum, this telephone line has been placed on the inside end of the cross-arm, the feeder being on the outside end; in addition to this, the telephone line is transposed every third pole.

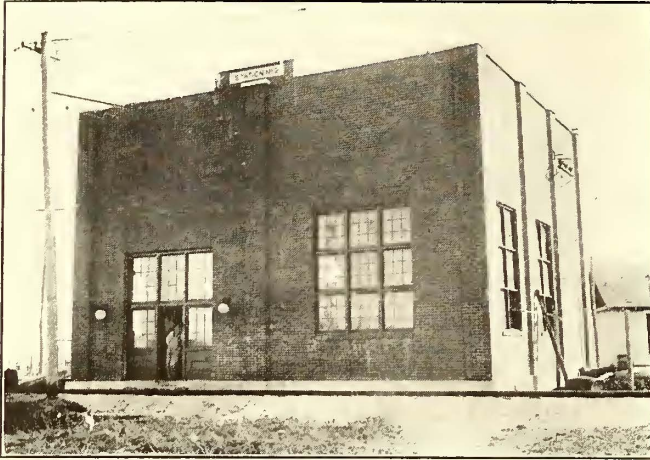
Electrical energy is purchased from the Empire District Electric Company at 33,000 volts, three-phase. In order to have equipment furnished on time, it being found impossible to get satisfactory shipping dates from manufacturers on new equipment, the substation equipment was purchased from the Cincinnati & Columbus Railway. Only one substation is now operating, but the



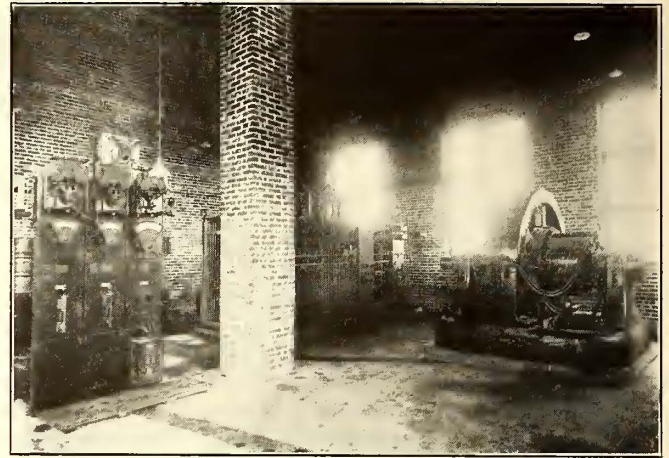
VIEW SHOWING FREIGHT SIDINGS AND OVERHEAD. NOTE THE HUGE "CHAT" PILE AT THE RIGHT



A TYPICAL MINE, AT PICHER, WITH THE NUMEROUS ONE-STORY MINERS' SHACKS IN THE DISTANCE



OUTSIDE SUBSTATION NUMBER 2—AT PICHER—
NOW OPERATING



INSIDE SUBSTATION NUMBER 1—AT COMMERCE—
NOT YET OPERATING

other will be put on the line very soon. The one operating is located at Picher and contains one 400-kw. G.E. converter, fed from three 145-kw. General Electric transformers. The other substation, located at Commerce, contains two 400-kw. General Electric converters and is being equipped with three 250-kw. new Pittsburgh transformers. The original transformers, from Ohio, had been used at 16,500 volts, and it proved desirable to make a new installation for satisfactory operation at the higher voltage rather than try to use the old transformers.

Both stations are being equipped with Westinghouse electrolytic lightning arresters. Both are equipped with Burke remote-control, high-tension switches.

The rolling stock of the company was likewise purchased from other railways, in order to secure it on time. Two large motor cars for passenger service were purchased from the old Blue Grass Line at Nashville, Tenn. These are equipped with four 100-hp. G.E. 205 motors and are of the interurban high-speed type. Four smaller cars, purchased from the Cincinnati & Columbus Railway at Ohio, are used for lighter traffic. These are equipped with four 50-hp. G.E. 57 motors. The road also has one Westinghouse-Baldwin 50-ton locomotive and the former freight equipment of the steam road, namely, ten gondolas, three flat cars, one ice car, two cabooses. The third caboose inherited from the former management has been converted into a line car. There is also a motorized package freight express

and baggage car which is used for handling small package shipments.

The regular schedule calls for sixty-six passenger trains per day over the line and freight service as demanded. The passenger traffic is largely composed of miners, many of whom commute daily from their homes in Miami to the mine, and also an interchange of miners from the other towns back and forth. The average passenger car-miles per day are something over 850. The exact figures for the month of February were 24,922. Already the officials of the road have some statistics which show the advantage of electrical operation. Measured at the substation, and including station loss, conversion, etc., the watts per car-mile are estimated to be about 3.87 in passenger service. At the present cost of electrical energy, this figures about 7.3 cents per car-mile and about 0.7 cents per passenger-mile. With the former operation of motor cars, the fuel cost alone was about 18 cents per car-mile.

On the freight side February showed 2,088 loaded car-miles and 2,196 empty car-miles handled with a locomotive mileage of 629. On a basis of 40 tons per car dead load, with the weight of the car not included, the cost of coal in January figured \$3.50 per car, whereas the cost of electrical energy for February figured \$1.27 per car.

The passenger traffic is handled on a fare base composed of 5-cent units, with, however, a 10-cent minimum fare. The fares are, figured from Miami: To Com-



TWO VIEWS ON THE RIGHT-OF-WAY SHOWING OVERHEAD CONSTRUCTION ON CURVES AND
GIVING SOME IDEA OF THE NATURE OF THE LINE

merce, 4 miles, 10 cents; to Blue Goose, 7 miles, 15 cents; to Cardin, 8 miles, 20 cents; to Picher, 10 miles, 25 cents, and to Century, 13 miles, the end of the main line electrification, 30 cents. A commutation book, with 100 5-cent coupons, is sold for \$4. Only about 10 per cent of the fares are paid by the use of these coupons, however.

The business of this road, as seen, depends almost entirely upon the activity of the lead and zinc industry, and particularly of the Miami field which this road feeds. Traffic in the latter part of 1920 and the early part of 1921, for instance, is considerably off from what could be considered normal. Of course, it is probably never expected that the war-time conditions of two twelve-hour shifts of seven days in the week will reappear. Road building should give some impetus, however, to traffic in this field on account of a possible demand for chat.

More than 4,000 carloads of this chat were shipped over the lines of the Northeastern Oklahoma Railroad alone during 1920.

But there are opportunities for diversifying the business of this railroad near at hand. Some 150,000 acres of coal land lie southwest of Miami; large coal lands also lie near Columbus, Kan., just to the north of the present lead and zinc field. As this territory becomes more and more developed by lease from the Indians or as the Indians obtain the right to sell the land and it becomes more attractive to outside capital there is a large territory which has no railroad facilities at all and which will offer opportunity for this newest addition to the electric railway field to expand. While no definite plans have been made, yet the management of the road realizes the situation and is awake to the possibilities of expansion, which it will probably undertake during the next four or five years.

And all of this expansion will be under electric traction, for the operating personnel of the road is thoroughly convinced of the efficiency of electrification. Compared with operation under conditions prevailing previous to electrification, the certainty of schedule, the decreased running time, the savings in power and other operating expenses, the general increased operating efficiency of the personnel itself are all features which have come on account of electrification and appeal to the management of the road.

Baltimore Tries Loading Platforms

Experimental Platforms Have Now Been in Use for Several Months—Results Show Their Value for Relieving Congestion and Also for Speeding Up Traffic—Thirteen Installed So Far

SOME months ago the subject of loading platforms was actively discussed in Baltimore between the public authorities and the officials of the United Railways & Electric Company and an experimental pair of platforms 5 ft. wide, 100 ft. long and 9 in. high were erected at North Avenue, at its intersection with Charles Street, which at this point is a thoroughfare 110 ft. wide between curbs, with the car tracks located in the center. On this pair of platforms rigid pipe railings were installed. These railings were carried 3 ft. above the level of the platform.

The results attending this original installation were very satisfactory, from the viewpoint of safety and convenience of passengers, from the standpoint of control of traffic by the police department and because of operating advantages to the railway company. Thereafter additional platforms were put in, until at the present time thirteen have been installed. A number of these were put in at the direct request of the Police Department.

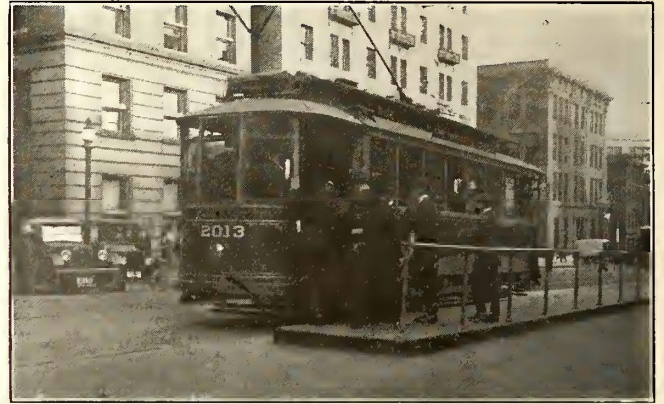
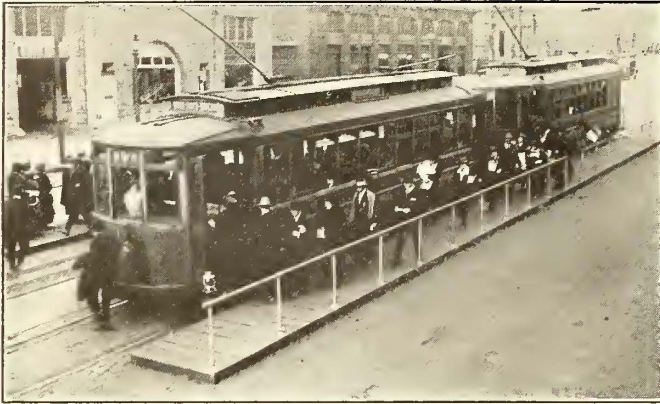
Queue loading is recognized as a very desirable and an effective aid to the rapid handling of passengers onto a car. One very satisfactory development from the use of these loading platforms has been what might be called automatic queue loading, as the comparatively narrow platform, with chains or rails on its outer edge, by its very construction promotes the unconscious adoption of the queue form of loading.

Plans were laid also for the installation of quite a few more platforms, but the Fire Department objected to their being put down in the narrower streets, because it felt that it would interfere with the operation of fire apparatus.

As a result of the Fire Department's objection the railway was unable to put platforms in at a number of locations where a study of conditions at the present time indicated their desirability and the Police Department had requested their installation. The co-operation of the Police Department has been of great assistance in successfully working out the plan, and the results from



LOADING PLATFORMS ON NORTH AVENUE AT CHARLES STREET



AT LEFT, PLATFORMS PRODUCE AUTOMATIC QUEUE LOADING. AT RIGHT, PLATFORM ON LIGHT STREET AT BALTIMORE

the public and operating standpoints have been very satisfactory.

On the original installations pipe rails were erected, but latterly chains have been used attached to upright stanchions, instead of the continuous pipe railing. This was found to be more desirable, because occasionally automobiles run into the platforms, and where the stanchions are connected by chains less damage is done than where a rigid rail extends the whole length of the platform. On the platforms and safety zones the Police Department supplies and maintains red oil lanterns during the night hours. On the ends of the platforms diagonal black and white stripes, similar to those used on railroad crossing gates, have been painted.

At a number of places where the company has been unable to get permission to install platforms because of the narrow streets isles of safety have been established. These were originally constructed with stanchions and iron pipes, making them rigid, but, for the reasons stated above, piping has been abandoned and the stanchions are now joined by chains. In some locations these stanchions had been in use before platforms were introduced, but recently the number of isles of safety have been materially increased.

A special study of traffic conditions at each location was made before platforms were laid down, and where practicable they were located around the corner from congested streets, this necessitating in some instances changing from the standard near-side stop to a far-side stop. This has been of value in relieving congestion.

The platforms are constructed of heavy planking laid on wooden sills and fastened to the street surface with drift pins. Consideration has been given to constructing them in a more permanent manner, with concrete curbs, either filled in with crushed stone or with an all-concrete surface, but for the present, until the experiment has gone further or the present platforms begin to wear out, no change will be made.

The accompanying illustrations indicate the method of locating these platforms and the additional safety which this improvement in the street car facilities of Baltimore provides for the traveling public.

Foreign exchanges record the inauguration of a trackless trolley line $1\frac{1}{4}$ miles in length and with four buses in York, England. The Bradford Corporation Tramway, which already has a number of these cars, has in contemplation a six-wheel trackless trolley bus, with seating capacity of fifty-seven, as well as some one-man buses with seating capacity of thirty each.

Trackless Trolley Demonstration

IN VIEW of the general interest in trackless trolleys, principally because of the present high cost of railway construction and competition from the motor bus, a practical demonstration of a new type trolley bus will be made at the Schenectady works of the General Electric Company the latter part of May.

A thirty-passenger type car, similar in external appearance to the front-entrance trolley car except that it has rubber-tired wheels, will be equipped with trolley pole, controller, motors and other necessary apparatus for the public demonstration. Suitable trolley wires have been strung, forming a loop for demonstration runs.

General Electric engineers estimate the cost of installing a single-track trolley line on an unpaved street as about \$35,000. On a paved street, where the trolley company is forced to pay for the pavement between its rails and 2 ft. outside, the cost jumps to \$75,000 per mile. The overhead for a single trackless trolley costs from \$5,000 to \$7,000 per mile, and where a double set of wires is strung the cost will average from \$7,000 to \$9,000 per mile. Comparing the operating cost with the motor bus, gas and oil costs on an average of 5 cents per mile, whereas with the trackless trolley the cost of electricity is but 2 cents a mile. The maintenance of equipment, including tires, averages $9\frac{1}{2}$ cents per mile for the motor bus as compared with 4 cents for the trackless trolley. For depreciation, figuring the life of the motor bus at five years, as computed from statistics supplied by nine leading auto bus manufacturers, the cost per mile is 3.4 cents, compared with 1.9 cents for the trackless trolley, based on a life of ten years.

Totaling the above figures, the saving in favor of the trackless trolley is 10 cents per bus-mile. Figuring that the average bus runs 35,000 miles per year this means a saving of \$3,500. From this amount there should be a slight deduction because of the lower initial cost of the motor bus, interest on money invested, etc., which, according to railway engineers, brings the saving in favor of the trackless trolley over its gas-driven competitor to \$2,700 per car per year.

With a sliding trolley pole the trackless trolley has a leeway of 18 ft., 9 ft. either side of the trolley wires. This gives it ample facilities to pass other vehicles on the street. Directly over the head of the driver is a lever by which the trolley pole can be pulled down from the wires without the operator leaving his seat.

After test and demonstration in Schenectady the car will be sent to Richmond, Va., for trial.

Features of the New Paris Franchise

Earlier Agreements, Similar to American Service-at-Cost Franchises, Failed to Stand War Strain—New Deal Involves Consolidation of Properties, 4.9 per Cent Net Return to Investor Guaranteed by the State and Rewards to Management and Men Based on Increasing Traffic and Achieving Economies

THE city of Paris and the Department of the Seine (in which Paris is located) have approved a consolidation and refinancing of the local street railway and motor bus facilities of the most far-reaching nature. At last accounts, the new plan required only the formal consent of the stockholders of the absorbed companies before going into effect. The terms of the new arrangement will best be understood if a brief account is given of the conditions leading up to this franchise.

THE AGREEMENT OF 1910

The General Omnibus Company, organized late in 1854, was a consolidation of several small horse-omnibus companies, and soon after it was founded received a franchise for buses and also for street railways. Under this franchise, which was for fifty-five years, the company not only built a great many street railway lines and extended its bus system but had a practical monopoly of all surface transport within the walls of Paris itself, and it was the only system (except the later underground railways) with which the Municipality of Paris had actual contractual relations.* The exceptions to this monopoly were certain bus lines which the steam railroads were permitted to operate to carry passengers to and from their railroad stations and several street railways which were permitted to enter Paris upon payment to the General Omnibus Company of certain royalties. In consequence of this latter development there were in 1910, when this franchise expired, thirteen street railway companies in Paris and vicinity, and these companies were operating with every conceivable form of propulsion—horses, trolley, conduit, storage battery, compressed air, steam, etc.

In 1910 the Municipality of Paris concluded an agreement with the General Omnibus Company which contained a number of features of general interest, aside from the provisions for motorization of the buses and electrification of the street railways, partly to trolley and partly to the conduit system, the latter being compulsory within certain areas. Among these features were the following:†

Change from Unit to Two-Fare System within City.—Although there had been no startling rise in costs by 1910, the General Omnibus Company seems to have realized that a continuation of the unit fare with free transfer was uneconomic on a system with an ever-growing increase in average length of ride. The unit fares of 15 centimes (3 cents) second class and 30 centimes (6 cents) first class (the latter including transfer privilege) were replaced by a zone system in which the base fare was 10 centimes (2 cents) second class and 15 centimes (3 cents) first class.

*For further particulars of this franchise see STREET RAILWAY JOURNAL, January, 1897, page 16; May, 1899, page 275, and Jan. 4, 1902, page 18.

†For further particulars of this franchise see ELECTRIC RAILWAY JOURNAL, Oct. 1, 1910, page 505.

Capitalization.—The capital of the General Omnibus Company was increased from 17,000,000 francs to 80,000,000 francs to take care of the reconstruction and electrification expenses. The company was required to set aside annually a sum amounting to not less than 5 per cent of its net profits to retire each year a portion of its stock, though the holders of the stock thus retired received "participation" certificates, entitling them to share in the profits after an initial dividend of 5 per cent had been paid on the unamortized stock and also to participate in any surplus after all stock had been retired at par when the company should be liquidated.

Return to the City.—In the agreement prior to 1910, the return to the city appears to have been confined to the usual paving upkeep tax and a tax based upon the number of cars. The agreement of 1910 retained the paving charge, but replaced the car tax by a charge on gross earnings. It was agreed that the bus system should pay the city 3½ per cent of gross earnings, with a maximum of 4 per cent if the receipts exceeded a certain set figure. On the other hand, the street railway system was to pay 3½ per cent minimum, if the return to stockholders was not more than 5 per cent, up to 6 per cent maximum according to the increase in return received by the stockholders. The city could call for a reduction in fare if the earnings per car-mile or bus-mile exceeded 32 cents and 33 cents respectively. This figure was based on the size of car then in use, but was to be changed according to a specified formula if cars of different capacity were put in service. The bus contract stated that the company would not be obliged to install certain additional routes until the average earnings per bus-mile attained a stated figure. So, too, the company was entitled to apply for higher fares if the average earnings fell below 33 cents per bus-mile, provided it operated a stated minimum mileage per annum. If all such payments to the city plus the local fuel tax (octroi) exceeded 6 per cent of gross earnings, the General Omnibus Company could apply for a reduction.

Full Regulation Retained.—The Municipality of Paris retained all rights to regulate routes, timetables and fares and to exert other police powers, such as approval of rolling stock and other equipment affecting the public safety and convenience. The company's accounts were to be audited by the city, city inspectors were to be carried free and the company was to pay all regulatory expenses up to a stated maximum per mile of route. Fines and forfeiture clauses to put teeth in the regulatory ordinances were also provided.

WHY THE 1910 AGREEMENT BROKE DOWN

The three or four years following the 1910 agreement, including the change to zone fares, saw heavy increases in traffic despite the large amount of reconstruction going on and the growing competition within old Paris of the underground railways. The public, however, felt that the company was not expanding its facilities and

improving its service as had been anticipated. In all likelihood, the extensive rebuilding program of the company did not tempt it to develop experimental services which would lower the average return per vehicle-mile to uneconomic levels.

With the arrival of the war in August, 1914, all progress naturally had to cease. In fact, it was necessary to make tremendous cuts in service because of man-shortage and other difficulties incident to the war. By 1916, also, the increase in wages, fuel and materials had become so great that the company applied for relief. It was not until 1918, however, that the first increases in fare were granted upon recommendation of a commission which had been appointed by the Prefect of the Department of the Seine to study both the matter of immediate relief and a permanent settlement.

TERMS OF RECAPTURE AND CONSOLIDATION UNDER GOVERNMENT AUSPICES

At this time there were six surface systems in the Paris metropolitan area as follows: The General Omnibus Company, Tramways-Nord, Tramways-Sud, Est-Parisien, Chemin-de-fer-Nogentais and Rive-Gauche, with a total of 943 km. or 584 miles of route. The capital investment of these companies totaled 420,900,000 francs, or approximately \$81,000,000 at pre-war exchange. The General Omnibus Company alone constituted practically one-half of this total. Both the city and the department were agreed that unified operation of all these lines was the indispensable basis of any post-war arrangement. To purchase these lines outright and operate them jointly offered a host of administrative entanglements.

Aside from this it did not seem feasible to the dominant political parties to go to direct community operation if it were possible to devise a plan whereby the business management of the lines would be retained without injury to the life and business growth of the community.

A plan was finally worked out and proposed which was built on the basis of private management. Following this plan, a contract was first made by the department with the city to reimburse the latter for payments in taxes, etc., which it would have continued to receive under the old franchise. Also by agreement with the city, the department purchased from the General Omnibus Company as of Jan. 1, 1921, all franchises and such properties and equipment as were of direct use in operating the lines. A special clause in the agreement reserved for the city council all powers necessary for the fixing and modification of schedules, fares and routes. Certain supplies, cash on hand and in bank remained the property of the company, but the supplies, under the terms of agreement, could be purchased at cost of manufacture. The terms of sale were to be fixed by a group of experts, three named by the Minister of Public Works, three by the company recaptured and three by the unanimous consent of the first six. In case of failure to choose the last three, the judges of the Court of Appeals were to be asked to name the additional experts. The payment was to be made in sixty semi-annual installments and, in accordance with rules applying to properties operated fifteen years or more, was to be based upon the net average earnings of the best five years out of the last seven years preceding the sale, but in no case was this amount to be less than the net receipts of the last of the seven years of the test period.

The capitalization of the companies included was:

	Capitalization, Francs
General Omnibus Company.....	200,000,000
Tramways-Nord	81,300,000
Tramways-Sud	65,200,000
Est-Parisien	41,400,000
Nogentais	21,000,000
Rive-Gauche	12,000,000

THE LEASE AND THE LEASING COMPANY

While the actual contract with the leasing and operating company is made by the Department of the Seine, the city and the department have an agreement for the purpose of retaining for the city such rights as "long possession confer and vital rights demand." By this agreement a certain exchange of jurisdiction is also accomplished so that the city obtains additional jurisdiction over departmentally licensed railways within the city limits and the department over parts of municipally franchised lines which extend beyond the limits.

Most important of the provisions which form Article 3 of the covenant between the two are: The department shall endeavor to make such modifications of tramway lines within the city limits as the city council may demand by special resolution, after consultation with the commission which will supervise the working clauses of the lease; a similar provision regarding autobus routes; an agreement to submit all such changes proposed by the department to the city council; and the city fares cannot be raised or lowered without a special joint resolution of the municipal council of Paris and the council of the department.

The city is also to be the judge as to standards of line, track and paving upkeep, and is to receive certain costs plus a 10 per cent or 15 per cent payment from the company for work done in connection with these matters. Snow removal costs are to be shared equally.

The operation of the superseded companies has been taken over through contract with the Department of the Seine by a new company formed under the direction of Andre Mariage, director-generator of the General Omnibus Company, subject to various conditions as set forth July 12, 1920, by the Prefect of the Seine in a statement to the municipal and departmental councils, and abstracted herewith:

The leasing company is to have a capital of 60,000,000 francs, of which 6,000,000 francs is to be a guarantee fund, provision being made for increasing this fund as the mileage of the railway and bus routes is enlarged. This 6,000,000 francs must be invested in city of Paris bonds or other similarly stable securities approved by the department. The stockholders of the former companies have the first right to subscribe to the new company's stock on an equitable pro rata basis.

The company is to be guaranteed a gross return of 6 per cent on its investment, but the actual return, after income tax deductions and the like, is 4.9 per cent, which is less than the current rate of return on French government bonds.

The department expects that deficits will prevail for some years to come, but it does not wish the company's management to do anything that will limit the usefulness of the system to the public. It has therefore provided two forms of incentive for the operators.

A Reward for Increased Business.—In addition to the guarantee the company is to receive a bonus for increasing the gross receipts. This bonus is 0.75 per cent of the annual gross receipts up to 250,000,000

francs and 1 per cent of the gross receipts in excess of this amount. From this fund must be paid the salaries of the executive officers and of the directing board and inspectors of accounts. Good management is defined as consisting, in effect, of serving the largest population possible; and it is added that any economies realized must not result in a reduction in the number of passengers. (The actual French for the last eight words reads "de la compression des voyageurs!") The rank and file employees will receive a premium equivalent to 4 per cent of the gross receipts from traffic and advertising.

A Reward for Operating Economies.—The company will also be entitled to reward for any operating economies that do not lower the standard of service. This reward may be expressed by the formula: $0.04 \times (R - 0.65E)$ in which "R" represents the gross receipts and "E" represents "operating" expenses as defined hereinafter. Out of this fund, 300,000 francs a year must be placed in a special reserve fund until the latter attains 3,000,000 francs and it must be kept at that amount. The purpose of this reserve is to have funds to make payments to the guarantee fund as the lines grow and to pay any penalties which may be levied against the company.

If the earnings, after subtraction of the awards, permit an 8 to 10 per cent dividend on stock or addition to surplus the extra above 6 per cent is to be divided between the department and the company. If there is enough to pay 10 per cent or more, the department will get three-fourths of the remainder.

ACCOUNTING METHODS

The accounts are divided under three heads as follows:

Financial, operating and remuneration. "Financial" covers all charges relating to the recapture annuities, certain minor war annuities, interest on reconstruction loans advanced by the department, etc. "Operating" not only includes the usual items connected with running a transportation system, but also include the cost of governmental regulation, of certification of accounts, of amortization of new investment in thirty years, of interest on guarantee and reserve funds, insurance, maintenance, renewals, and generally of all items not included under "financial" except the 6 per cent guarantee on investment and the efficiency awards which come under the head of "remuneration."

The company in taking over the properties guarantees to leave all employees undisturbed in their wages, seniority, privileges, etc., reserving merely the right to make changes in the case of employees receiving more than 25,000 francs per annum. It also agrees to continue the system of Workers' and Discipline Councils which were a characteristic of the General Omnibus Company's relations with its men. All employees must be French and must be chosen, so far as possible, from those who have lived at least three years in the Department of the Seine or in the contiguous departments; in the case of the latter the proportion of employees engaged should be in proportion to the mileage in their native department.

While the lease is for thirty years, the Department of the Seine reserves the right to annul the contract any sixth year upon two years' notice. In this event, the company will be reimbursed by the department for any capital not amortized and will receive the following amounts which are intended mainly to indemnify the

executive officials; possibly to liquidate long-term contracts with these officials:

2,000,000 francs if annulment occurs Jan. 1, 1927.
1,750,000 francs if annulment occurs Jan. 1, 1933.
1,500,000 francs if annulment occurs Jan. 1, 1939.
1,000,000 francs if annulment occurs Jan. 1, 1945.

The Prefect of the Seine will form a consulting board made up of an equal number of representatives from the city and departmental councils plus representatives from the company, various government departments, commercial and labor bodies, etc., but these outside members must not outnumber those from the two councils. The chairman, also named by the Prefect, will cast the deciding vote in case of equal division. The functions of this board are purely advisory and cover only such topics as the Prefect assigns to it for consideration. This commission will study the allocation of the 4 per cent gross receipts bonus previously mentioned.

A more important commission is the control board made up only of representatives from the two councils and the administrative staff of the Prefect. This board will be the actual regulatory body so far as operation, audit and changes in executive personnel are concerned.

Trackless Trolleys in Germany

A RECENT inquiry in regard to trackless trolleys in Germany shows that before the war there were only three such lines in that country, one in Saxony, one in South Germany and one in Westphalia. Of these three lines only the first mentioned is now in operation, while the two others stopped work during the war. These three lines had only a total of 12 miles. The line now in operation is used as an auxiliary extension to the electric railway system of the town of Wurzen in Saxony. The two other lines served as communications between small towns.

As to financial results, the cost of installation was found to be only one-fourth to one-third of an ordinary line with tracks, but the maintenance of rolling stock cost 25 per cent more. The running expenses were found to be somewhat lower than in the case of motor-bus lines. A prime condition of the trackless trolley is a well-paved road surface and no attempt has yet been made to use this form of traction with unpaved roads. The cost of installation of the overhead wire before the war was 16,000 marks per mile, and is now from 100,000 to 160,000 marks a mile.

The line in Saxony is using cars of 3 tons in weight, with space for from twenty to twenty-four passengers, ten to fourteen of whom can be seated. The cars have solid rubber tires. In times of ordinary traffic they are run with one man. The cars are using a short-circuit brake, trolley poles of the most simple design and motors of 15 to 25 hp. with worm drive. The cost per car before the war used to be 40,000 marks and is now 100,000 to 125,000 marks. The present wages paid to the attendants on the Wurzen line are 5 to 7 marks per hour. The fare, which before the war was only 5 to 10 pfennigs, has, in the case of the one line in operation, risen to 30 pfennigs. Only in one case are data given as to total cost of running operations and revenue per kilometer. The first was 21½ pfennigs, and the second 24½ pfennigs in 1912. The German Street Railway Association, which collected these data, declares that trackless trolley lines have found little favor in Germany and there is no likelihood of their development in the future.

No Reason to Change Standard Birney Safety Car Design

An Analysis of the Situation Is Convincing Proof that the Present Standard Should Be Retained Until Some Definite and Reasonable Arguments Are Forthcoming

By W. H. HEULINGS, JR.

Vice-President and General Sales Manager the J. G. Brill Company

THE article by J. C. Thirlwall, General Electric Company, which appeared in the April 16 issue of the *ELECTRIC RAILWAY JOURNAL* under the caption "Why Alter the Standard Safety Car Design?" was an excellent presentation of sound and sensible facts which deserve the thoughtful attention of all officials of street railways having safety cars in service or in contemplation.

The advantages of standardization to railway companies are so great that every precaution should be taken that no change in safety car design should be requested which will destroy the manifold advantages of the present standard design by increasing the weight of the car, the cost of operation and the cost of production and by lengthening the time of delivery.

WILL BUILD SPECIAL SAFETY CARS

The J. G. Brill Company built the eight special double-door safety cars for Madison and the four double-door cars for Lancaster, these being the only cars out of 2,839 safety cars our plants have built which have double doors. The remaining 2,827 cars have the standard single door and are responsible for the remarkable savings and earnings which have been attributed to safety cars generally. We do not recommend anything but the standard Birney safety car as designed, but where demanded we will make changes at a higher cost and longer delivery, but we certainly advise against such deviations from standard.

SMALLER CARS AND MORE OF THEM

From reports received from Madison it is evident that both the public and the railway company are satisfied with the double-door arrangement on the cars which we built for them. It would be foolhardy to deny that the simultaneous ingress and egress of passengers is quicker than with the single door, but what does this amount to? If the time saved is sufficient to warrant the additional expense and the loss in power saving which results from the increased weight, then the double-door car possesses an economic advantage. This is, in my judgment, very uncertain; in fact, I should almost say, "It certainly is not." Our experience with the safety car indicates that railways making their installations on ratios which mean more frequent service to the public have had the best results, and there is no overcrowding as there is sufficient space for the standing passengers on each car.

PUBLIC MUST BE CONSIDERED

In installing safety cars on a car-for-car basis advantage is taken by the operating company of the saving in platform wages and power consumption, but the public loses car space. They may get the same number of seats, but if the same number of standing passengers are jammed into a smaller space naturally they'll be dissatisfied and no one can blame them for kicking loud and long.

It is true that Madison tried out five standard Birney

safety cars but, as stated in the March 12 issue of the *ELECTRIC RAILWAY JOURNAL*, the installation was made on a car-for-car displacement basis. This should certainly be taken into consideration when analyzing the safety car experience in that city.

SAFETY CAR MUST BE SMALL

To increase the length and other dimensions of the standard safety car is simply to defeat its object. In order that operating companies may reduce headways to compete with other forms of transportation by running more cars it must be possible to do this at less total cost than previous service, and this is only possible with the use of smaller light-weight units.

Mr. Thirlwall referred to another installation where the manager of the road changed some of his cars to a double-door platform type. This company had already improved its service by reducing its headways and it was only the desire on the part of the manager to speed up loading and unloading by the simultaneous ingress and egress of passengers that prompted him to convert these cars to a double-door arrangement. He soon found that the advantage in loading and unloading time gained was offset by other difficulties which are attendant to double-door operation on one-man cars and then rechanged his cars to the smaller standard single-door platform.

It is therefore evident that there has really been no convincing argument advanced that a change of the standard design of the Birney safety car to a double-door platform arrangement would satisfactorily meet general operating conditions and at the same time retain for the railway companies the maximum economies in initial cost and in cost of operation.

The city of Terre Haute, Ind., has certainly made a success of safety car operation, and since the safety cars have been in service this city has been visited by railway managers not only from cities in this country but also from foreign countries, and the fact must not be lost sight of that, during the course of an address at the convention of the American Electric Railway Association in Atlantic City last year, E. M. Walker, general manager of the railway lines, stated, "We attribute our success with safety cars principally to the fact that we have stuck religiously to the standard car."

Changes Proposed in British Classification

A COMMITTEE of British accountants of tramway undertakings has been considering revisions in the standard form of tramway accounts. The present form was drafted in 1904 by a joint committee of the Institute of Municipal Treasurers and Accountants and the Municipal Tramway Association, and since has been adopted by practically all municipal tramway undertakings and some of the companies operating tramways. Time has shown that different interpretations have been placed upon the directions given in the standard form. In consequence, the municipal tramway managers at Leeds, Sheffield and Manchester and the London group of company-owned tramways arranged for a conference of the accountants of those organizations. The accountants met in December of last year and have now recommended some alterations and additions to the standard form, without, however, fundamentally changing it.

Lists of accounts were also recommended for motor bus operation and trackless trolley operation.

The Engineer and Eminent Domain*

Legal and Engineering Problems in Condemnation Procedure Analyzed
and Various Pitfalls Pointed Out—Determination of Advisability
of Condemnation Sometimes Difficult—Complete History Is
Given of One Condemnation Case, with All Documents

BY CHARLES R. HARTE

Construction Engineer the Connecticut Company, New Haven, Conn.

EMINENT domain is the right or power of a sovereign state to appropriate property to particular uses for the purpose of promoting the general welfare. Whether, as was said by the Supreme Court of Connecticut, it "is a reserved right attached to every man's land, and paramount to his right of ownership," or whether, as is more generally held, it is a power which the state may exercise for the welfare of the community, is of much less consequence to the engineer than the fact that there is a power by which property needed to promote the general welfare of the public may be taken from the owner when for any reason he is unwilling to dispose of it at a fair price. Unlike the police power, however, which regulates the use and enjoyment of a man's own property by himself so that he shall not interfere with the general welfare of his community and compels him to submit, without compensation, to any inconvenience or loss he suffers in consequence of that regulation—the Volstead act being a shining example—eminent domain is a forcible exchange, and the taking can be effected only when just compensation is made to the owner.

THE LEGAL SITUATION

The power is a legislative one and may be delegated by the Legislature, to any one properly authorized, to promote the general welfare of the public. Unfortunately, however, the courts have been by no means agreed as to just what is such a proceeding, and while the Legislature delegates the right and must therefore decide upon what it considers a public use, the correctness of this opinion is subject to the decision of the courts, and as one perplexed judge said, "No question has ever been submitted to the courts upon which there is a greater variety and conflict of reasoning than that presented as to the meaning of the words 'public use' as found in the different state constitutions regulating the right of eminent domain." A striking example of this difference of opinion is seen in Connecticut and Rhode Island decisions. In the first state a transmission line between the power and substations of an electric railway is a public use, and, provided of course the company is authorized to exercise the right of condemnation, the necessary right-of-way may be taken by eminent domain. In the sister state just east, however, "that which pertains simply to means of supply is the private business of the company," and the Rhode Island Suburban Railway was consequently unable to exercise the power that way. And because the power is an unusual and a "harsh" one, the courts quite generally have been very critical both to be sure that the company or person actually had been delegated the power and that its exercise was in strict accordance with the rights it had.

From the legal standpoint, then, in case condemnation

is under consideration, it is essential to know, first, whether the company actually has received the right from the Legislature; second, whether the proposed use of the property desired is one which the courts of the state in which it is, have accepted as "public," or, at least, is not one they have classed as a "private" use, and, finally, that the proceeding itself is in strict accordance with the requirements of the state. It is therefore highly important that the legal advisers be not only good lawyers but that they be also familiar with condemnation proceedings as administered in the state involved.

IS CONDEMNATION WISE?

Before condemnation proceedings are started, it is well for a company to consider what is involved and what is to be gained.

In delivering the opinion of the United States Supreme Court in the Minnesota rate cases, Justice Hughes said of the railroad: "It is equipped with the governmental power of eminent domain. In view of its public purpose it has been granted this privilege in order to prevent advantage being taken of its necessities. It would be free to stand upon its legal rights, and it cannot be supposed that they would be disregarded."

Unfortunately, while this is perfectly true from the legal point of view, it disregards a practical fact that is often of the greatest importance. Under favorable conditions the proceedings may be short and sweet, and in a few states after a preliminary hearing the company, upon depositing an approved bond with the court, may proceed with the work while the lawyers fight out the questions of the final settlement. In the large majority of the states, however, it is possible for the owner to prevent possession for a very considerable time. If the proceedings have been started well in advance of the date on which the property is necessary, this may cause but little trouble; more usually these cases arise at the last minute. Of course, if the owner refuses to sell on any terms, and the project is not to be abandoned, there must be condemnation or relocation. Such cases, however, are comparatively rare. The trouble usually arises over the amount. It then becomes an interesting question what to do; namely, (1) condemn, and have the expenses of the proceeding and the interest on the investment kept idle until possession is obtained, and in many cases the increased cost of the work which has to be done in an adverse time because of the delay to be added to the award for the land, or (2) pay out of hand the price asked and save the costs and annoyances of the holdup, but establish a precedent which may make trouble later on, and is unfair to those who sold at a reasonable price.

At the time of the Minnesota rate cases, although every one who had had experience in buying right-of-way knew that its cost averaged materially higher per acre or square foot than similar adjacent land, there

*See "The Engineer and the Right-of-Way," by Mr. Harte, *ELECTRIC RAILWAY JOURNAL*, June 26, 1920, page 1301.

were available no definite proofs of the claim made by Mr. Cooper of the Northern Pacific, that while city land cost but little more per unit when bought for right-of-way than for other purposes, farm lands averaged in cost three times as much for the one purpose than for the other. The court refused to accept his belief, but recent investigations in connection with the federal valuation of the railroads, however, indicate that Mr. Cooper was quite right. In view of the facts that the ratios for the several classes of land do not materially vary in different parts of the country, it may fairly be considered that the costs of condemnation and the consequent delays, but not including the normal price of the land condemned, in the case of farm lands are at least double the normal price of all the farm lands of the right-of-way; that in the case of suburban land the extra cost is equal to the normal price, while in city land the excess is about one-fourth, normal price referring to the price which would be paid for similar land in ordinary parcels and sales.

The moral of this is that condemnation is expensive, and the possibility of adjustment in a different way should be carefully considered before it is employed.

THE ENGINEERING SITUATION

If it has been decided that condemnation must be resorted to, the engineering features demand consideration. While there are wide differences of opinion as to many legal features, the authorities are quite generally agreed that the actual taking must very closely follow the petition.

If the taking describes a strip of sufficient width for all structures there will be little difficulty provided it is not held unnecessarily large—some of the states are very strict in this respect—but particularly in the case of a transmission line; locations for the individual poles, guys and other elements can usually be obtained with far less trouble and expense, and if the description is properly made and includes right of access, such a taking serves as well as a strip unless changes are necessary at a later date.

Just what should be included in the description depends upon the attitude of the courts. In some states it has been held that the right of the company to exercise the power of eminent domain should be most carefully considered, but once its right to employ it is established the intent of the Legislature rather than a literal interpretation should be considered. In others a most exact compliance with all the forms has been insisted on. As it is desirable to have the taking as elastic as may be safe, this is a matter which calls for close co-operation between engineer and counsel, and the former should not forget that the owner's title extends above and below the surface of the ground, and that the wires between the poles, the overhang of the cross arms, and the underground portions of anchors and braces occupy the property no less than the poles themselves, and, further, that the right of location does not of necessity carry with it the right of entry at a later date for the purpose of maintenance and replacement. Still further, it should be remembered that a long pole cannot be taken around a sharp bend in a narrow right-of-way without overhanging adjacent land and that a right of access to the line for the purpose of maintenance may be held to apply only to the land of the grantor, and not to give the right to team or go over it to reach a part of the line on other land unless it is so stated. Finally, not only should there be set out

the right to trim to a definite distance from the center line all existing trees, but it should also be borne in mind that old trees grow and new ones are planted from time to time, and the right should definitely provide for proper future trimming. In New York "the right to trim such trees as may be necessary to protect said line from interference" was held too indefinite a statement to permit the determination of the damage to be compensated for.

It should not be supposed that every case of condemnation involves such complications, however. Probably in nine cases out of ten, even with a very faulty taking, no questions will be raised, but in case of trouble the matter may prove very serious, as there have been decisions holding that one condemnation exhausted the power, and it is the part of wisdom to be sure rather than sorry.

THE ACTUAL TAKING

The details of the actual taking differ materially in different states, but there are certain general features common to nearly all. It is generally necessary to state that the parties cannot agree upon a price, and there must be a vote by the proper parties that the property in question, so described as to definitely fix it, be taken. Thereafter come such hearings, viewings, determination of damage, awards, appeals, and final decisions as may be required by the state in which the land or property is located.

It may be of interest to see just what steps were followed in a case in Connecticut, where, however, the award was not appealed.

PROCEDURE FOLLOWED IN CONNECTICUT

In 1917 the Connecticut Company found it desirable to build a transmission line between New Haven Station "A" and North Haven, and having made a location, on July 21, 1917, filed with the Public Utilities Commission a petition (Exhibit I) for the approval of the location and the method of construction, whereupon the commission appointed (Exhibit II) a date for a hearing when all parties might be heard, and, following the hearing, made a finding of approval (Exhibit III).

Most of the desired location was secured with little trouble, but one John S. Palmer, while not hostile to the company—in fact, the action was rather a friendly one—asked a price which seemed all out of reason. Accordingly on Nov. 3 the directors of the Connecticut Company voted (Exhibit IV) to locate upon and take the necessary land. The petition to the commission for the taking asked a reapproval of the plans, since the first plan did not show the necessary detail for condemnation. This petition and the notice of a hearing on it were repeated in the finding of necessity (Exhibit V). Then followed a petition (Exhibit VI) to the Superior Court to appoint appraisers; the court order (Exhibit VII) for a hearing on the taking; the hearing, at which appraisers were presented to the court and accepted (taker and owner each select one and these two choose a third); the formal court approval (Exhibit VIII); the trips of the appraisers to the spot to view the land and determine the damage; and, finally, the return (Exhibit IX) of the appraisers to the court, which has the effect of a court judgment. It will be seen that from the vote of the directors on Nov. 3 to the judgment was a trifle over sixty days. This was a friendly suit, speeded by all, with no appeal. In the Stevens case, also in Connecticut, the matter was dragged out for five years.

Documentary Exhibits in the Palmer Condemnation Case

Exhibit I—Petition for Approval

TO THE HONORABLE PUBLIC UTILITIES COMMISSION OF THE STATE OF CONNECTICUT.

The petition of the Connecticut company respectfully represents:

1. That it is a company organized and existing under and by virtue of a charter granted by the General Assembly of the State of Connecticut, for the purpose of constructing and operating street railways, and having its principal office at New Haven in said State.

2. That it has the right to construct a transmission line consisting of two circuits, each of three stranded 2/0 copper cables on porcelain insulators with metal pins bolted to 3 3/4 x 4 3/4 yellow pine cross arms having angle iron braces, all on "Class B" chestnut poles, details being shown on the attached sketches, said line to run from Station A of said Connecticut Company in New Haven on the poles carrying the present Branford transmission line as far as Middletown Avenue, New Haven, and thence on private way and along and across highways as shown on the accompanying plan to the North Haven substation of said Connecticut Company.

3. That it has caused to be made a plan showing the highways in and through and over which it proposes to build said transmission line and also detail plans showing the construction at highway, railroad and wire line crossings, which first named plan is entitled, "The Connecticut Company—New Haven Lines—Office of Construction Engineer, New Haven, Conn.—Proposed transmission line—Station A, New Haven to North Haven substation—Scale 1:20,000 Date July 21, 1917," and which detail plans, of which four show pole top construction and twelve show crossings set forth in their respective titles, the location of each kind of construction and of each crossing.

WHEREFORE, it prays your Honorable Body, after public notice and hearing thereon, to accept and adopt said plan, and make all necessary orders to render available the location of said transmission line and its structures as approved by your Honorable Board.

Dated at New Haven, Conn., this twenty-first day of July, 1917.

THE CONNECTICUT COMPANY,
by Charles Rufus Harte,
Construction Engineer.

Dated at Hartford, Conn., this twenty-third day of July, A. D., 1917.
PUBLIC UTILITIES COMMISSION,
By Henry F. Billings,
Secretary.

Hartford County, ss.

Hartford, July 24, 1917.

Then I deposited in the post office in Hartford, by registered mail, true and attested copies of the foregoing, addressed to the parties as directed in said order.

Attest:

Henry F. Billings,
Secretary.

Exhibit III—Finding of Commission on Petition for Approval

PUBLIC UTILITIES COMMISSION STATE OF CONNECTICUT, DOCKET NO. 2437.

In the matter of petition of the Connecticut Company for approval of proposed method and manner of construction of a transmission line from station A of said petitioner in the City of New Haven to Middletown Avenue in said city, and thence on private way and along and across highways in the town of North Haven.

On July 23, 1917, the following petition was presented.

(Here followed the petition in full.)

The foregoing petition was duly assigned for hearing at the office of the Commission on Monday, July 30, 1917, at 11:30 o'clock in the forenoon, at which time and place the parties appeared and were fully and finally heard. Several of the companies whose lines will be crossed by the proposed construction appeared at said hearing but offered no objection to the granting of said petition. Petitioners stated the general purposes of the proposed construction and the specifications under which it would be carried out. Blue print plans referred to in the petition were explained at said hearing. It was stated that in general the method of construction would follow the specifications approved by the United States Bureau of Standards as set forth in the National Electric Safety Code, so-called, issued November, 1916. It was stated that the normal length of span between poles would be 125 feet but that owing to topographical conditions and presence of structures of other companies, the span distance would be somewhat increased at certain points, but that in such cases the extra span length would be compensated for by additional strength of construction.

Upon consideration of all the facts shown at said hearing we are of opinion and find that approval should be and it hereby is given for the construction by the Connecticut Company of a transmission line from Station A, so-called, of said Connecticut Company in New Haven, on poles carrying the present Branford transmission line of said company, as far as Middletown Avenue, New Haven, and thence on private way and along and across certain highways to the substation of said Connecticut Company, in the town of North Haven, as shown on blue print plan on file in this office and made a part hereof, which plan is entitled: "The Connecticut Company, New Haven Lines, Office of Construction Engineer, New Haven, Conn. Proposed transmission line Station A New Haven to North Haven, Substation. Scale: 1/200,000, July 21, 1917. Drawn by A. L. C. Traced by A. L. C. Approved Charles Rufus Harte, Construction Engineer." Said construction to be in accordance with specifications approved by the United States Bureau of Standards as set forth in the National Electric Safety Code, so-called, issued by said Bureau November 15, 1916, and as more particularly shown on blue print plans on file in this office and made a part hereof which plans, consisting of four blue print sheets showing pole top construction, one blue print sheet showing construction at angle points, and thirteen blue print sheets showing construction at crossings of highways and lines of other companies are sub-titled respectively as follows:

1. New Haven-North Haven transmission line; pole top construction on special crossing poles with 11,000 and 33,000 volt circuits.
2. Pole top construction on poles with 11,000 and 33,000-volt circuits, wood poles.
3. Normal pole top construction, wood poles.
4. Pole top construction on special crossing poles carrying 33,000-volt circuits.

1. New Haven-North Haven transmission line; construction at angle points.

1. Proposed transmission line, station A New Haven to North Haven substation, main highway crossing.
2. Crossing over Northford highway.
3. Old highway crossing, North Haven, Conn.
4. Crossings over main highway and Connecticut Company tracks.
5. Crossing over highway bridge near Muddy River.
6. Crossing over New York, New Haven & Hartford Railroad at Muddy River.
7. Crossing over Montowese Railroad Station.
8. Crossing over New York, New Haven & Hartford Railroad at Middletown Avenue.
9. Crossing over New York, New Haven & Hartford Railroad near Quinnipiac River.
10. Crossing over Ferry Street—Middletown Avenue.
11. Main Street and Peck and Blatchley Avenue crossings.
12. James and Humphrey Streets and Railroad crossings.
13. Grand Avenue crossing.

the normal length of span between poles to be not exceeding 125 ft. and whenever a longer span is found to be necessary the method of construction shall be such as to accord the same factor of safety as exists under the normal construction with 125 ft. span.

We hereby determine and direct that notice of the foregoing be given to the petitioner, to the city of New Haven, to

Exhibit II—Notice of Hearing by Public Utilities Commission

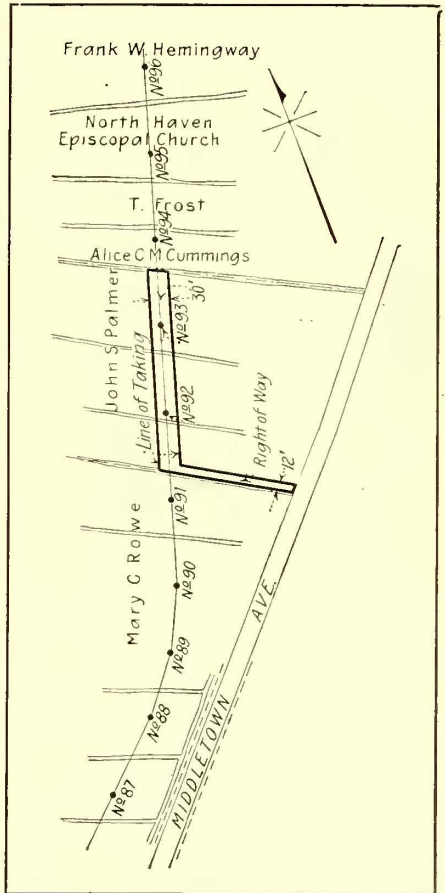
PUBLIC UTILITIES COMMISSION STATE OF CONNECTICUT DOCKET NO. 2,437.

In the matter of petition of the Connecticut Company for approval of proposed method and manner of construction of a transmission line from station "A" of said petitioner in the city of New Haven to Middletown Avenue in said city, and thence on private way and along and across highways in the town of North Haven.

On July 23, 1917, the following petition was presented:

STATE OF CONNECTICUT, OFFICE OF THE PUBLIC UTILITIES COMMISSION.

Upon the foregoing it is ordered that same be heard at the office of the commission in Hartford, Room No. 47, State Capitol, on Monday, July 30, 1917, at 11:30 o'clock in the forenoon and that notice of the time and place of said hearing be given to the petitioner, to the city of New Haven, to the town of North Haven and to the various pole line companies whose wires it is proposed to cross, by Henry F. Billings, secretary of this Commission, by forwarding by registered mail, true and attested copies of said petition and of this order of notice for hearing, addressed one to Victor S. Curtis, secretary the Connecticut Company, New Haven, Conn., one to the Mayor and Board of Aldermen of the city of New Haven, Conn., one to the Board of Selectmen of the town of North Haven, North Haven, Conn., one to the Southern New England Telephone Company, New Haven, Conn., one to the United Illuminating Company, New Haven, Conn., one to George M. Yorke, vice-president Western Union Telegraph Company, No. 195 Broadway, New York, N. Y., one to S. L. Hays, general foreman Western Union Telegraph Company, New Haven, Conn., one to Postal Telegraph-Cable Company, Connecticut Mutual Building, Hartford, Conn., and one to Arthur E. Clark, secretary the New York, New Haven & Hartford Railroad, New Haven, Conn., on or before the twenty-fourth day of July, 1917, and due return make hereon.



CONNECTICUT COMPANY'S PLAN, SHOWING LAND TO BE CONDEMNED AND TAKEN FROM JOHN S. PALMER. THIS PLAN IS PART OF EXHIBIT IV

the town of North Haven, and to the various pole line companies whose wires it is proposed to cross, by Henry F. Billings, secretary of this Commission, by forwarding by registered mail, true and attested copies hereof, addressed one to Victor S. Curtis, secretary, the Connecticut Company, New Haven, Conn., one to the Mayor and Board of Aldermen of the city of New Haven, New Haven, Conn., one to the Board of Selectmen of the town of North Haven, North Haven, Conn., one to the Southern New England Telephone Company, New Haven, Conn., one to the United Illuminating Company, New Haven, Conn., one to George M. Yorke, vice-president,

Western Union Telegraph Company, 195 Broadway, New York City, one to S. L. Hays, general foreman, Western Union Telegraph Company, New Haven, Conn., one to Postal Telegraph-Cable Company, Connecticut Mutual Building, Hartford, Conn., and one to Arthur E. Clark, secretary, the New York, New Haven and Hartford Railroad Company, New Haven, Conn., on or before the Ninth day of August, 1917, and due return make hereon.

Dated at Hartford, Connecticut, this third day of August A. D., 1917.
 RICHARD T. HIGGINS } PUBLIC UTILITIES
 C. C. ELWELL } COMMISSION
 Hartford County, ss.:

Hartford, Aug. 9, 1917.
 I hereby certify that the foregoing is a true copy of the original order as on file and record in this office.

Attest:
 By Henry F. Billings,
 Secretary.

Exhibit IV—Vote of Directors to Condemn Land of John S. Palmer

At a regular meeting of the directors of The Connecticut Company held in the general offices of the company in the Second National Bank Building, 129 Church Street, New Haven, Conn., on Saturday, Nov. 3, 1917 at 10:45 a.m.

On motion, duly seconded, the following resolution was unanimously adopted:

"RESOLVED: That in connection with Authorization No. 2538 to build a transmission line between New Haven and North Haven, public necessity requires that the extension of the already existing transmission line be located upon and across land, the record title of which is in Harry V. Santry, of New Haven, Conn., but to which John S. Palmer, of said New Haven, claims to have an interest, said land being in the town of New Haven, county of New Haven and State of Connecticut, and bounded and described as follows:

"Southeast by Middletown Avenue; Southwest by land formerly of Albert Good-year, now of Mary C. Rowe; Northwest by the creek, and Northeast by land formerly of T. Folsic, now of Alice C. M. Cummings; containing four and one-half (4½) acres, more or less, being salt meadow. All as shown on attached plan, entitled: "The Connecticut Company, New Haven, lines, Office of Construction Engineer, New Haven, Conn. New Haven-North Haven Transmission Line. Location across John S. Palmer, Nov. 3, 1917," and

"RESOLVED: That the Connecticut Company locate said transmission line upon the land above described, and take all land needed therefor."

A true copy of record,
 (Signed) V. S. Curtis,
 Secretary.

Exhibit V—Finding of Commission on Petition to Fix Limits of Taking

PUBLIC UTILITIES COMMISSION, STATE OF CONNECTICUT, DOCKET NO. 2604.

In the matter of petition of the Connecticut company, for recapproval of construction of a transmission line in the city of New Haven and town of North Haven, as appears on file under Dockets Nos. 2437 and 2437A, dated Aug. 3, 1917 and Sept. 13 1917, respectively.

On Nov. 15, 1917, the following petition was presented:

TO THE HONORABLE PUBLIC UTILITIES COMMISSION OF THE STATE OF CONNECTICUT. The petition of the Connecticut Company respectfully represents:

1. That it is a company organized and existing under and by virtue of a charter granted by the General Assembly of the State of Connecticut, for the purpose of constructing and operating street railways, and having its principal office at New Haven in said State.

2. That on the eighteenth day of September, 1917, after public notice and hearing, your Honorable Commission approved plans for locating, constructing, and maintaining certain foundations, posts, poles, and wires and all appurtenances thereto necessary for the operation of the railway of the Connecticut Company by electricity, as more fully appears in Docket No. 2437 and Docket No. 2437A in the files of your Honorable Commission.

3. That the location of said foundations, posts, poles, wires and appurtenances, calls for the same to cross certain land in the city and county of New Haven, the record title of which stands in the name of one Harry V. Santry, as more definitely shown on blue print hereto attached, and entitled: "The Connecticut Company, New Haven Lines, Office of Construction Engineer, New Haven, Conn. New Haven to North Haven Transmission Line. Location across John S. Palmer. Scale 1" = 100'. Approved, Charles Rufus Harte, Construction Engineer."

4. That one John S. Palmer, residing on Quinipiatic Avenue, in the town of North Haven, Conn., also claims an interest in said land.

5. That said John S. Palmer refuses to grant permission to the Connecticut Company to erect its posts, poles, wires and other appurtenances across said land.

Wherefore, said the Connecticut Company prays your Honorable Body, after notice to said John S. Palmer, to re-approve said construction and to prescribe upon said land the limits within which real estate shall be taken for the purposes approved in Docket No. 2437A, and to give written approval to said the Connecticut Company of the location as limited by you.

Dated at New Haven, Conn., this fifteenth day of November, 1917.

THE CONNECTICUT COMPANY,
 By S. W. Baldwin,
 Its Attorney.

STATE OF CONNECTICUT, OFFICE OF THE PUBLIC UTILITIES COMMISSION.

Upon the foregoing it is ordered that same be heard at the office of the Commission in Hartford, Room No. 47, State Capitol, on Monday, Nov. 26, 1917, at 11:30 o'clock in the forenoon and that notice of the time and place of said hearing be given to the petitioner, to Harry V. Santry, in whose name stands the record of title of certain land proposed to be crossed, and to John S. Palmer, also claiming an interest in said land, by Henry F. Billings, secretary of this Commission, by forwarding by registered mail, true and attested copies of said petition and of this order of notice for hearing, addressed one to Victor S. Curtis, secretary, the Connecticut Company, New Haven, Conn., one to Harry V. Santry, 134 Grand Avenue, New Haven, Conn., and one to John S. Palmer, Quinipiatic Avenue, North Haven and City of New Haven, Conn., on or before the nineteenth day of November, 1917, and due return make hereon.

Dated at Hartford, Conn., this nineteenth day of November A. D., 1917.

PUBLIC UTILITIES COMMISSION,
 By Henry F. Billings,
 Secretary.

Hartford County, ss.

Hartford, Nov. 19, 1917.

Then I deposited in the post office in Hartford, by registered mail, true and attested copies of the foregoing, addressed to the parties as directed in said order.

Attest:
 Henry F. Billings,
 Secretary.

Exhibit VI—Petition to Superior Court to Appoint Appraisers

THE CONNECTICUT COMPANY
 vs.
 JOHN S. PALMER

Superior Court
 New Haven County

In the matter of the application of the Connecticut company for the appointment of appraisers to estimate damages for the taking of real estate.

TO THE HONORABLE JAMES H. WEBB,
 A Judge of the Superior Court:

The application of the Connecticut Company, a corporation organized and existing under and by virtue of a charter granted by the General Assembly of the State of Connecticut, for the purpose of constructing and operating street railways, and having its principal office at New Haven in said State, respectfully represents:

1. That your applicant on the third day of November, 1917, by a vote of its Board of Directors of that date, took for railway purposes the land described in said vote, for the construction, maintenance or operation of necessary and properly supported conductors of electricity for the transmission of electricity from New Haven upon its railway where said electricity is generated to North Haven, in said State, where said electricity is to be applied, as more fully appears in said vote which is attached hereto, marked "Exhibit 'A,'" and made a part hereof.

2. That on the twenty-seventh day of December, 1917, the Public Utilities Commission of the State of Connecticut, under its Docket No. 2604, approved the taking of said land and limited the location of said land to be taken, as more fully appears in copy of said Docket No. 2604, which is attached hereto, marked "Exhibit 'B,'" and made a part hereof.

3. The only party now claiming an interest in said land is John S. Palmer, who resides on Quinipiatic Avenue, in the Town of North Haven, County of New Haven, and State of Connecticut.

4. Your applicant is unable to obtain said land by agreement with said John S. Palmer.

Wherefore, your applicant applies to Your Honor to appoint appraisers, as provided by statute, to estimate all damages that may

arise to any person from the taking and occupation of the above described real estate for railway purposes, and asks that Your Honor will further order that reasonable notice of this application be given to said John S. Palmer.

Dated at New Haven, Conn., this twenty-ninth day of December, A.D., 1917.

THE CONNECTICUT COMPANY,
 By S. W. Baldwin,
 Its Attorney.

Exhibit VII—Court Order for Hearing on Taking

THE CONNECTICUT COMPANY

vs.

JOHN S. PALMER

Superior Court
 New Haven County

In the matter of the application of the Connecticut Company for the appointment of appraisers to estimate damages for the taking of real estate.

The foregoing application of the Connecticut Company praying for the appointment of appraisers to estimate all damages that may arise to John S. Palmer from the taking and occupation of real estate for railway purposes, as set forth in said application, having been presented to me, a Judge of the Superior Court, it is

ORDERED that the same be heard and determined before me at ten o'clock in the forenoon on the third day of January, A.D. 1918, at the Superior Court Room in New Haven, and that notice of the pendency of said application and of this order be given to said John S. Palmer, the party in interest, by some proper officer or indifferent person, by personally presenting to said John S. Palmer, or leaving at his place of residence, a true and attested copy of said application and of this order, and return make of his doings under this order.

Dated at New Haven, Conn., this thirty-first day of December, A.D., 1917.

(Signed) JAMES H. WEBB,
 A Judge of the Superior Court.

Exhibit VIII—Court Approval of Choice of Appraisers

In the Matter of the Application of THE CONNECTICUT COMPANY, a corporation, of New Haven, Connecticut.

vs.

JOHN S. PALMER,
 of North Haven, Conn.

Before
 HONORABLE JAMES H. WEBB,
 A Judge of the Superior Court,
 New Haven County,
 Jan. 3, 1918.

JUDGMENT

In the matter of the application of the Connecticut Company in the above entitled cause, dated December 29, 1917, and returnable before me as a judge of the Superior Court on the third day of January, 1918, the parties, having been duly notified, appeared before me in the Superior Court Room in New Haven on said date and agreed upon.

Ernest Brockett, of North Haven, Conn.,
 William A. Wright of New Haven, Conn.,

and David B. Andrews, of North Haven, Conn., as the appraisers.

Wherefore, in accordance with the statutes in such cases made and provided, I appoint

Ernest Brockett,
 William A. Wright,

and David B. Andrews, appraisers to estimate the damage, if any, which may arise to said John S. Palmer from the taking and occupation of the land in the manner and form as limited in Docket No. 2604 of the Public Utilities Commission of the State of Connecticut, as more fully appears in said Docket, a copy of which is to this petition attached.

HONORABLE JAMES H. WEBB,
 A Judge of the Superior Court.

Exhibit IX—Appraisers' Return, Which Is Equivalent to a Judgment by the Court

In the Matter of the Application of THE CONNECTICUT COMPANY, a Railway Corporation, of New Haven, Conn.

vs.

JOHN S. PALMER,
 of North Haven, Conn.

Before
 HONORABLE JAMES H. WEBB,
 A Judge of the Superior Court,
 New Haven County,
 January, 1918.

RETURN OF APPRAISERS

To the Clerk of the Superior Court in and for the County of New Haven, Conn.

The undersigned, appointed Jan. 3, 1918, upon application of the Connecticut Company, by the Honorable James H. Webb, a Judge of the Superior Court, appraisers to estimate and assess all damages arising from the taking and occupation of certain lands, fully described in said application to John S. Palmer, the owner of said lands, respectfully report:

That they gave due notice to said John S. Palmer, and to the applicant, that they would meet for the purpose of their appointment on the nineteenth day of January, 1918, at the Superior Court House, in the City of New Haven, in said New Haven County, at ten o'clock in the forenoon, and on said day they met at the time and place named in their notice, and were duly sworn, and met said John S. Palmer and the applicant, who made appearance, and on said day they viewed the premises described in the application, and they fully heard said parties their witnesses and counsel, concerning the damages aforesaid.

That the lands taken and occupied by the applicant are contained in the land in the city and county of New Haven, State of Connecticut, and bounded and described as follows:

Southeast by Middletown Avenue; Southwest by land formerly of Albert Goodyear, now of Mary C. Rowe; Northwest by the Creek, and Northeast by land formerly of T. Forsie, now of Alice C. M. Cummings, containing four and one-half (4½) acres, more or less, being salt meadow, and the amount taken is limited as follows:

So much of said land as may be necessary for the erection and maintenance of a transmission line, together with the necessary supports, wires and fixtures, over, across and upon the land of said Palmer, the land necessary to be taken for this purpose not to exceed a total width of thirty feet (30 ft.), the same being fifteen feet (15 ft.) in width on either side of the center line of poles; and a right of way easement in said land twelve feet (12 ft.) in width and running in a westerly direction along the southerly boundary of said land, from said Middletown Avenue to that portion of the land hereinbefore referred

to as necessary to be taken for the erection and maintenance of said transmission line, all as shown on plan attached to the petition herein and entitled: "The Connecticut Company, New Haven Lines. Office of Construction Engineer. New Haven, Conn. New Haven-North Haven Transmission Line. Location across John S. Palmer, No. 3, 1917."

That said John S. Palmer appeared and claimed damages arising from the taking and occupation of said land as above described.

Wherefore, the said appraisers, having viewed said land and fully considered the evidence of said parties and their witnesses, and the claims and arguments of counsel, do estimate all damages arising to said John S. Palmer from the taking and occupation by the applicant, for the purposes set forth in said application, at one hundred dollars (\$100).

Dated at New Haven, Conn., this (?) day of January, 1918.

ERNEST BROCKETT }
WILLIAM A. WRIGHT } Appraisers.
DAVID B. ANDREWS }

Equipment and Design Features of Metropolitan District Cars

Improvements Over Cars of Older Design Include Use of 190-Hp. Tapped-Field Motors, Semi-Automatic Acceleration and More Compact Arrangement of Auxiliary Equipment

AN ARTICLE dealing with the new steel rolling stock received by the three railways operating London's rapid transit lines was printed in the March 5 issue of this paper. This dealt more particularly with their ability to permit rapid transfer of passengers as determined by the number and arrangement of doors. Also some attention was devoted to a general description, which included the layout of the seats, the replacement of straps with handrails and posts and interior fittings. Now more detailed information has been forthcoming relating to the general design and equipment features of the Metropolitan District Railway cars.

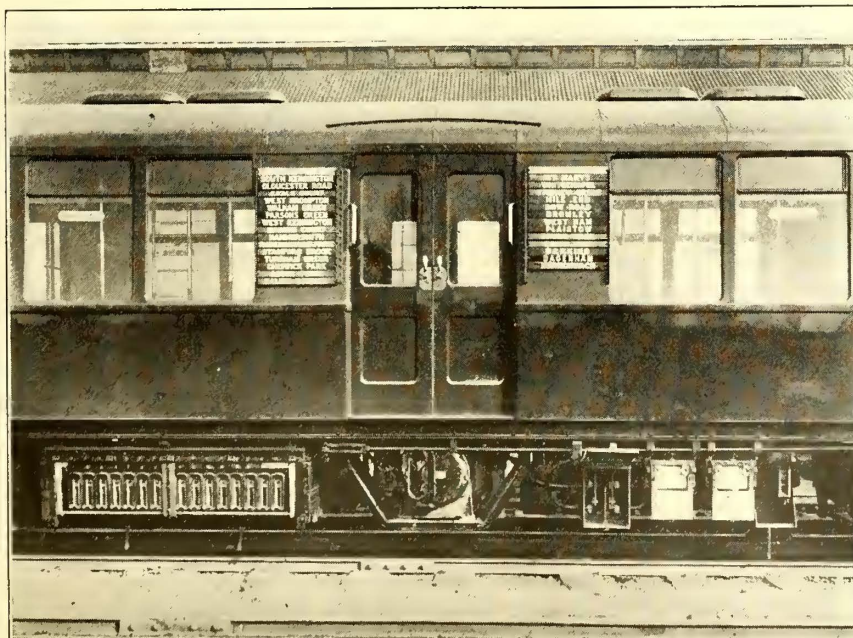
The first cars of the order, comprising 100, were put in service in February. During the first few days an eight-car train was stationed for a few hours at one of the busiest stations, with the view of letting the public familiarize itself with the improved rolling stock as a

concrete example of how Lord Ashfield was overcoming congestion difficulties in the underground railways. The train aroused a great deal of public and newspaper interest and comment.

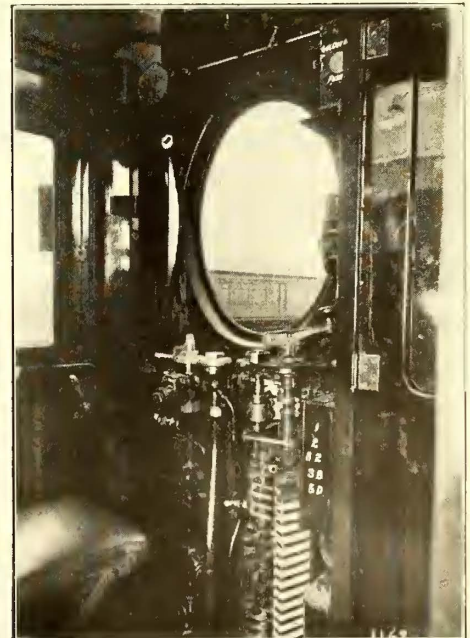
The cars are 49 ft. long and 9½ ft. wide. Their height is about 12 ft. The motor cars weigh about 50 tons each, the control trailers 29 tons and the trailer cars 27.5 tons. The wheel base of the motor trucks is 7 ft. 10 in.

Much thought has been put into the electrical design, for that equipment embodies and co-ordinates the most modern apparatus. The motor cars are each equipped with four G. E. 260 motors, which are of the interpole tapped-field self-ventilating type. They are rated at 190 hp. for one hour and 182 amperes continuously. The motors are fitted with twenty-tooth pinions geared to sixty-three-tooth gears. The wheels are 36 in. in diameter. Each pair of motors with its control gear constitutes a complete unit equipment. The normal rate of acceleration will be 1½ m.p.h.s.

Substantial improvements have been made in the control apparatus. The contactor tips are provided with arcing horns and a molded arc chute. The interlocks are of the disk type, mounted on the back of the contactor.



RESISTORS, COMPRESSOR, ISOLATING SWITCH, MOTOR-FUSE BOX AND CIRCUIT BREAKER ARRANGED ON UNDERSIDE OF CAR



MOTORMAN'S CAB ON LEFT-HAND SIDE OF CAR—CONTROLLER COVER OFF

The contactor box with all its contactors, resistances, etc., is a unit complete with wiring and has its own terminal base. The reverser connected to the motor fields is of the drum type operated by a pair of opposed solenoid coils. The control is non-automatic except that the motor field is weakened automatically by the tapped-field relay when the current decreases as the last parallel point on the controller is reached.

The cars are equipped with Westinghouse clasp brakes of the standard type and are provided with automatic slack adjusters. Hand brakes are fitted to all motor cars and control trailers.

The underframes are constructed entirely of steel, bulb angles form the sole bars and the center longitudinals are rolled steel channels running the whole length of the frame. The cross bearers at the trucks are pressed channel sections. The floor plates are stiffened with short angles and pressings across from the sole bars to the center longitudinals.

The motor car truck side frames are channel sections running the whole length of 13 ft. to the headstocks, but are cut away on the bottom flange to receive the axle boxes. The bolsters are built up of 8 x 3 in. channels 5½ in. apart and stiffened with ⅝-in. plates.

The former arrangement of carrying the draft gear back to the kingpin has been abandoned and a short drawbar fixed to the longitudinal members is substituted. Tight couplings between cars is the result of the use of a central spring buffer through which the drawbar head passes.

Rules for Track Foremen

Eastern Massachusetts Gives Nine Suggestions to Help Them in Their Work

F. B. WALKER, *engineer maintenance of way Eastern Massachusetts Street Railway, has got out the following nine suggestions for the track foreman on that system:*

THINGS TO DO IF YOU ARE TO MAKE A SUCCESS IN 1921 ON YOUR DIVISIONS

1. Keep all tools and equipment properly repaired. Blaming your tools is a POOR EXCUSE.
2. Make requisitions and properly record all material used. Taking material without requisition is THEFT.
3. Secure approved authority for all work not current maintenance. This railway has to have SOME SYSTEM.
4. Know that proper equipment and tools and efficient men are on every job. Lack of these shows POOR PLANNING.
5. Concentrate on more extensive and better repairs to rail joints. Poor joints make POOR TRACK and high maintenance COSTS.
6. Weld as many joints as possible with due regard to costs. Welded joints are a substantial ECONOMY.
7. Drain your track at all seasons—DIG, DITCH and DRAIN. Bad drainage is a CRIME. Its penalty is DEATH to track and motors.
8. Reciprocate in use of tools and cars with other divisions. Because you are a GENTLEMAN.
9. Team work means SUCCESS. Secure this by having all your men know, so far as is consistent, the costs, plans and reasons for doing our work.

One-Man Departments Are to Be Avoided

Chamber of Commerce Meeting

Paper on Arrested Development of Public Utilities Presented by Edward N. Hurley at One General Session at the Annual Meeting Held at Atlantic City

THE annual meeting of the United States Chamber of Commerce, held last week at Atlantic City, concluded on April 29. On the evening of April 28 Secretary Herbert Hoover of the Department of Commerce presented an address. At the final meeting President Defrees was re-elected president.

The only paper directly related to public utilities was on their arrested development and was presented by Edward N. Hurley, formerly chairman United States Shipping Board and now with the Hurley Machine Company, Chicago, Ill. An abstract follows:

Arrested Development of Public Utilities*

BY EDWARD N. HURLEY

Formerly Chairman United States Shipping Board

AMERICA today is at the crossroads of electrical development. It is a question whether we are to go forward or stand still. At this very moment the electrical industry is suffering from arrested development. The industry is awaiting the verdict of the American people. We like to think of ourselves here in America as the pioneers in the science of electricity. We have been the pioneers, but the job we started has not been half done. There are still fourteen million homes in the United States without electric service and which eventually will have it. It is authentically stated that if the present problem of housing the population is to be met, the United States needs 1,500,000 additional homes, 500,000 additional factories, 5,000 public schools, 5,000 churches, 60,000 apartment buildings and 15,000 theaters. These, too, mean electric service. There are 150,000 pending applications for power by existing or new industrial plants desirous of utilizing electricity.

PROPER ENCOURAGEMENT NEEDED

If the proper encouragement is given to the electric light and power industry, the industry will spring forward in the next decade faster even than in the past decade. The result unquestionably will be a lowering of the cost of living and the conservation of national resources which cannot fail to benefit the whole population. I think it will be agreed that upon the development and application of electrical energy, more than upon any other one thing, are dependent both the speeding up of production and the conservation of our natural resources.

The financial standing of a well managed street railway, gas or electric lighting plant is as vital to the life and development of a community as its banks, and should be protected against unfair attacks so that customers and the investing public will have confidence in the properties, resulting in a desire to purchase utility securities when offered. The American people must realize that confidence in public utility securities cannot be had by constant, unjust criticism. If the same kind of public attack should be made upon national and state banks in the same communities where members of state commissions and other public officials are now bitterly assailing the central stations and street railway companies, the public would lose confidence and in a very

*Abstract of address presented at the annual meeting of the Chamber of Commerce of the United States, Atlantic City, N. J., April 29, 1921.

short period these banks would be forced to close their doors.

FINANCING FROM EARNINGS IMPOSSIBLE

No public utility corporation subject to regulation can finance its requirements out of earnings.

For every dollar of additional annual gross revenue from the sale of electric energy by a light and power company it is necessary to provide additional facilities involving an investment of from \$4 to \$6. Thus a company with a gross revenue of, say, \$1,000,000 per year, to provide for a growth of 10 per cent per annum (\$100,000), which is a very moderate rate, would have to spend \$400,000 to \$600,000 for additional generating capacity and distribution facilities. With earnings limited by commission regulation to 8 per cent on the invested property value, which is below the actual cost of obtaining capital, it will be readily seen that additional capital must be secured if the facilities are to be provided to enable the growing service requirements of the community to be met, and such capital can be obtained only if assured a reasonable, permanent return.

Therefore, adequate facilities for the transportation, lighting and industrial requirements of a growing community can be made available only if the attitude of the public and of the commission authorities toward the electric enterprise is such as to encourage the necessary capital investment and to afford it the security as to principal and return without which the investor will refuse to become interested in the situation.

When financing, companies are compelled to make provisions for ample reservations, so that today public utility securities with substantial reserves are gilt-edged.

We must use scales to weigh our local utility problems, and withhold public criticism until the real facts are thoroughly known. For instance, one particular case of snap judgment happened in connection with the National War Labor Board during the war. The employees of the street railway in a town of about 250,000 demanded an increased wage. The War Labor Board granted the increase without giving the management a chance to present its side of the case. The matter was later reviewed after the wages had been put in force. It was then found that the street railway company could not meet the increase awarded and the interest on its bonds. It was suggested that the company increase the rate of fare, but it developed that if the rate of fare was increased to meet this over-night increase in wages, the reduction in the number of passengers carried—in the number of people who would stop riding rather than pay this increased fare—would make it impossible for the company to meet its fixed charges. This hurried decision, in fact, placed the street railway corporation in such an embarrassing position that a readjustment of wages and conditions was necessary in order to permit the street railway to survive.

GOVERNMENT OWNERSHIP OR PRIVATE OWNERSHIP

Although at one time sympathetic toward government ownership, I am certain, after a number of years in government service, that no community can receive the industrial service to which it is entitled under municipal or governmental management. The cause for this fact lies in the human element. No city, state or national industrial enterprise can expect to obtain from management, or from men, an average of more than 50 per cent of personal efficiency, or more than 50 per cent of per-

sonal interest in their work, and it must be remembered that this percentage will gradually decrease the longer the individual manager or the individual employee is in this industrial government service.

I say again that it is not humanly possible to obtain the same effort or interest from managers or men employed in industrial government service that exists in competitive private ownership, and that as a result, if the advocates of government ownership investigate the facts carefully and impartially, they will find that government operation in industrial service is a flat failure from a "service to the public" standpoint. This is true not only in America but it is a proved fact throughout the world.

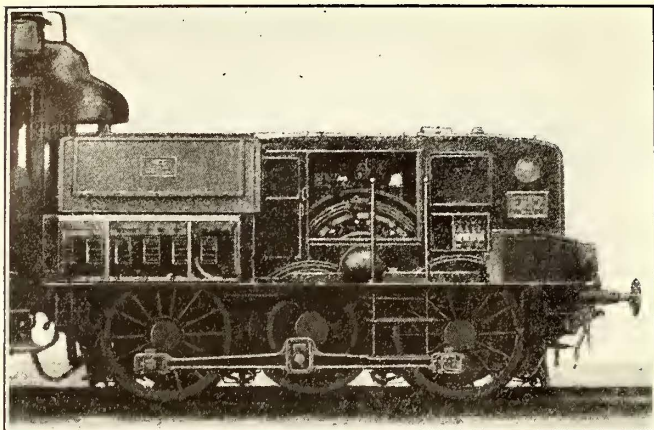
If the members of the Chamber of Commerce of the United States of America, with their great power and influence, were to take a keen personal interest in public utilities in their respective states, insisting that justice be given the public and the utilities, a permanent step toward solving this most important problem would be taken.

Swiss Comment on American Electric Locomotives

IN A RECENT issue of *Schweizerische Bauzeitung*, I. A. Laternser, an engineer of Zurich, Switzerland, compares the qualities of a number of electric locomotives. These, with the conventional designations used abroad,* were as follows: General Electric freight locomotive for Milwaukee Railway (2B + B + B + B2), direct current; General Electric express passenger locomotive for Milwaukee Railway (1B + D + D + B1), direct current; Westinghouse freight locomotive for Pennsylvania Railroad (1C + C1), alternating current; Westinghouse express passenger locomotive for Milwaukee Railway (2C1 + 1C2), direct current; Oerlikon freight locomotive for Swiss Federal Railway (1C + C1), alternating current; Oerlikon express passenger locomotive for Italian State Railways (2C2), three-phase.

Comparing the geared and gearless types, Mr. Laternser disapproves of the latter on account of the low center of gravity and the former on account of the decreasing gear efficiency with increase in speed. He also objects to the large unsprung load in all three types of Milwaukee locomotives mentioned, stating that this produces excessive wear of rails, and calls attention to the fact that the two leading American firms building electric locomotives are not agreed as to the best construction for express passenger and freight types of heavy locomotives. It seems strange to him that both the General Electric Company and the Westinghouse company have had such excellent results with their respective types of construction. He considers the American designs for regeneration to be complicated and not fully reliable, and the whole design of electrical equipment of American locomotives to be more complicated than that of the Swiss Federal type. The two Oerlikon locomotives mentioned are the most powerful yet built for use abroad and are both equipped for regenerative braking.

*The wheel arrangement of locomotives is designated thus: Beginning at the front end of the locomotive the number of pony axles is designated by a number, then the number of driving axles on the successive trucks by letters, A representing one driving axle, B two axles, C three axles, etc., a final number being used to indicate the number of pony axles at the rear. If there are any intermediate pony axles their number and position are indicated by numbers properly placed in the symbol.



EXPERIMENTAL ELECTRIC TRACTOR FOR USE ON BERLIN RAPID TRANSIT LINES



EXPERIMENTAL MULTIPLE UNIT TRAINS IN OPERATION IN BERLIN DURING PAST FEW MONTHS

Novel Electric Train Drive in Berlin

Experiments Indicate Superiority of Multiple-Unit Over Locomotive Operation in This Service—Ingenious Application of Electric Tractor Principle Suggests Early Days in This Country

IN THE article by E. C. Zehme appearing in the issue of the *ELECTRIC RAILWAY JOURNAL* for March 5, 1921, page 438, mention was made of some experiments in Berlin with rapid-transit trains. In a recent issue of the *Zeitschrift des Vereines deutsches Ingenieure* considerable detail is given of the experimental multiple-unit train which is in use, and also of the small electric tractors.

Referring first to the tractor, which is of noticeably low construction (being less than 5 ft. high), it is of interest to note that a complete suburban train, consisting of twelve coaches, has been propelled by two of these tractors, one each front and rear, controlled from the front platform of the first coach. The tractor draws current from a pantagraph mounted on the roof of the first coach.

The tractors contain each a single-phase commutator motor of 600 hp., hourly rating, or 580 hp., continuous rating, with forced air cooling. This drives a jackshaft through a reduction gear with a ratio of 1 to 3.54, and the jackshaft is in turn rod-coupled to the two driving axles. The framework of the tractor is made up largely of cast steel, the lower part of the motor being part of the casting.

Directly above one of the axles is mounted the main transformer, of 650-kva. hourly rating. It is of the air blast type. About one-sixth of the transformer output is required for train heating. A 15-kw. fan provides forced circulation for transformer and motor. On the other side of the motor, and above the second axle, is located an air compressor for operation of brakes, oil switch, pantagraph and rail sanders. Nine taps on the low-voltage winding of the transformer, two choke coils and two small resistors provide for twelve positions of the controller.

The wheelbase of the tractor is 9½ ft., the wheel diameter 4 ft. 5 in., the complete weight about 75,000 lb., the "unsprung" load 11,500 lb., the maximum speed 40½ m.p.h., the maximum speed of the motor 900 r.p.m., and the drawbar pull at the start 21,200 lb.

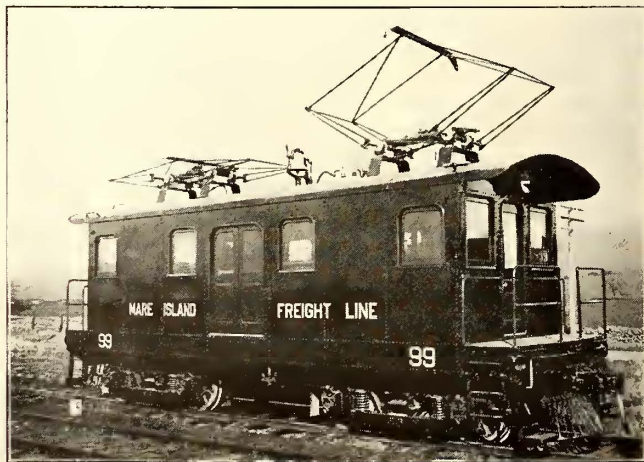
The tractor or locomotive plan for operating rapid transit trains in Berlin is, of course, highly experimental. It is doubtful if the rate of acceleration which can be produced with this arrangement is sufficient for

local conditions. Another experiment which has been tried within the past few months is the use of motor cars and trailers, each motor car having an hourly rating of about 350 hp. and weighing completely equipped about 68 tons. The experimental train which has been in successful operation during the past winter consists of two motor cars and three trailers.

A Small Single-Phase Locomotive for Use at Mare Island

THE San Francisco, Napa & Calistoga Railway has just completed in its shops at Napa a 50-ton single-phase locomotive. It is to be used to handle government freight between the company's connection at Napa Junction with the Southern Pacific Company and the government's delivery yards at the Mare Island Navy Yard. Mare Island was recently connected with the main land by a causeway built by the government and electrified by the railway.

This locomotive, which was built especially for this service, has an over-all length of 35 ft. and a width of 9 ft. 6 in. The cab itself is 26 ft. long and at each end is a 30-in. platform. It is equipped with four Westinghouse 132-A motors mounted on heavy Baldwin trucks. Westinghouse AMM brake equipment is installed. The motors are geared with a ratio of 16 to 67 to the 34-in. steel-tired wheels. The locomotive takes its power from the 3,300-volt, 25-cycle line through a sliding pantagraph trolley. A 250-kw. transformer fed through an auto-



THE 50-TON SINGLE-PHASE LOCOMOTIVE USED ON THE MARE ISLAND CAUSEWAY

matic oil circuit breaker provides suitable secondary voltage through the usual combination of switch groups and preventive coils.

The steel underframe for this locomotive is made in one piece. This single casting, weighing 7 tons, has 13-in. center sills and 10-in. side sills. Buffer plates of $\frac{3}{4}$ -in. boiler iron were riveted around the ends, dropping low enough in the center to carry the pilot and extending around the sides a distance of 30 in. beneath the ends of the cab. Standard A.R.E.A. engine pocket couplers with 3-in. pins are attached through these plates to the steel end sill which forms a part of the underframe casting. The floor space provided for the equipment is 4 ft. x 18 ft. A structure of 3-in. x 3-in. angles with eight posts and suitable screens forms a cage for the inclosure of all apparatus.

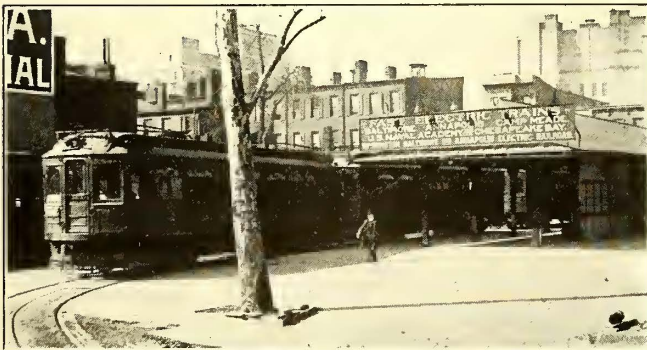
Ammeters are placed in the engineer's cab and an Economy wattmeter is provided on the high tension side of the transformer for metering the total energy consumed.

The locomotive is owned jointly by the San Francisco, Napa & Calistoga Railway and the Sacramento Northern Railway.

George A. Hearn, superintendent of equipment, was the designing and construction engineer.

W., B. & A. Has New Terminal in Washington

AS ANNOUNCED in the news columns of this paper for March 19, 1921, the Washington, Baltimore & Annapolis Electric Railroad has begun the use of its new terminal in Washington, D. C. The terminal is located but three blocks from the Treasury Building. The railway purchased approximately one-half of the



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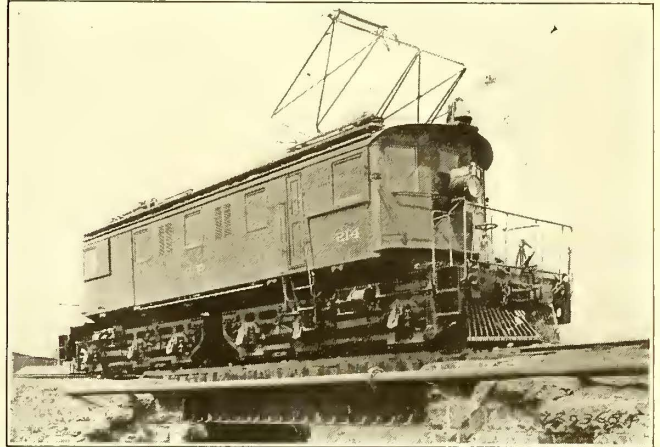
TAKE ELECTRIC TRAIN HERE FOR BALTIMORE

city block bounded by New York Avenue, Twelfth, Thirteenth and Eighteenth Streets, N. W., laid three new 200-ft. tracks into this yard and constructed new loading platforms. Buildings which were previously on the site have been utilized for waiting room, ticket office and news-stand and also with numerous offices on the upper floors.

Previous to the construction of this terminal the cars came up only as far as Fifteenth Street on New York Avenue, and loading was done from the street at these locations. The crowds waiting for cars in the streets led to such an interruption of traffic that protests were constantly being made and there were also general objections on the part of the public to the practice of loading these large interurban cars from the street. The new special trackwork was furnished by the Lorain Steel Company.

Paulista Locomotive Ready for Delivery

THE first Baldwin-Westinghouse freight locomotive for the Paulista (Brazil) Railway has been completed and tested. The passenger locomotives are nearing completion. The initial service on the double-track line between Jundiáhy and Campiñas, a route-mileage of 28, will be furnished with eight freight locomotives



BALDWIN-WESTINGHOUSE 3,000-VOLT DIRECT-CURRENT FREIGHT LOCOMOTIVE FOR PAULISTA RAILWAY

and four passenger machines. Orders for two of each type were obtained by the Westinghouse Electric & Manufacturing Company. The remaining eight locomotives are being built by the General Electric Company.

This electrification marks a milestone in the broad application of the natural resources of Brazil through the replacement of imported coal for power development. These locomotives are to be used in main-line freight service on the Paulista Railway, which is the main broad-gage trunk line of the most prosperous and productive part of the State of São Paulo.

This type locomotive weighs 105 metric tons (231,000 lb.) and has six driving axles each equipped with one 280-hp. direct-current motor. The motors are arranged for operation with two in series on the 3,000-volt line. Each locomotive is designed to handle trailing loads up to 770 tons over a line having a maximum grade of approximately 2 per cent. It is equipped with M.C.B. couplers for testing purposes, which will later be replaced with Continental draft gear. Also vacuum train brakes will replace the temporary pressure brake.

Enormous quantities of coffee, beans, rice, cereals and cattle are transported over this line by thoroughly modern and efficient railroading methods. Electrification is the latest step in the growth and progress of this notable railway, which is one of the most important lines in all South America.

The Denver & Interurban Railroad, Denver, Col., is planning to span South Boulder Canyon at Eldorado Springs with a suspension foot bridge. This canyon is one of the most picturesque chasms of Colorado and the new bridge will afford a wonderful view of the mountain scenery. The cliffs rise above the water of South Boulder Creek more than 1,000 ft. on the north side. On the south side of the canyon Castle Rock Cliff is a precipice of only 650 ft., so the bridge will be suspended in the air about 600 ft. because of the topography of the cleft forming the gateway. The company expects to go ahead with the proposition as soon as financial conditions will permit.

Electric Locomotive Characteristics

Engineer of Manufacturing Company Discusses Qualities of the Several Types of Locomotive Available and Outlines the Well-Known Advantages of Electric Motive Power

ON APRIL 14 N. W. Storer, of the general engineering department of the Westinghouse Electric & Manufacturing Company, read a paper before the electrical section of the Franklin Institute, Philadelphia. With the aid of a large number of lantern slides he showed how the electrical and other characteristics of different types of electric locomotives compare among themselves and with the characteristics of the steam locomotive. The accompanying set of curves was one of the series which he showed.

Mr. Storer discussed his topic under a number of different heads, listing thus the salient features of the electric locomotive and accompanying the summary with comments and illustrations. The principal points which he made were briefly as follows:

With the electric locomotive the power that can be applied to a train is in no way limited by the size of the individual motive-power unit. Theoretically the locomotive can draw the maximum amount of power that can be utilized at one point in the train.

With the electric locomotive the length of the operating division of a railroad is no longer limited by the locomotive. A record for a continuous twenty-four-hour run of 766 miles has been reached by passenger locomotives on the Chicago, Milwaukee & St. Paul. Electrification permits radical changes in terminals, due partly to the absence of smoke, dirt and noise and very greatly to the application of multiple-unit car equipment for the suburban traffic. The advantages in the use of the electric locomotive for long tunnels is obvious.

Electrification involves conservation in fuel.

Due to the greater capacity which can be secured from the locomotive unit, electrification results in greater effectiveness of labor.

Increased reliability of motive power is also an important feature of electrification.

The characteristics of the electric locomotive that make it so desirable may be summarized thus: Its maximum tractive effort is from two to four times its normal continuous running tractive effort. Due to the fact that the capacity of the electric locomotive is limited by the heating of the motors, it can easily develop considerably more power in cold weather than warm. Practically all of the wearing parts of the electric locomotive have normally a long life.

Mr. Storer then discussed the characteristics of the several types of electric locomotives. He said that the characteristics of the direct-current locomotive are especially suited for railway service, since the speed curve falls rapidly as the tractive effort increases. The alter-

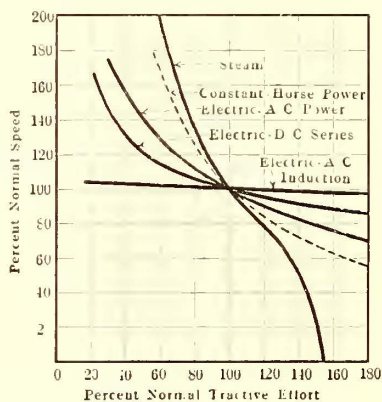
nating-current locomotive does not have the ability to produce the high starting torques which are possible with the direct-current locomotive, but on the other hand the speed control is more easily and efficiently obtained by voltage variation. The induction-motor locomotive utilizes the constant speed characteristics of the induction motor. This motor is capable of producing very heavy starting torques and of carrying heavy load, but on heavy loads the speed is maintained at practically constant value and the power required increases practically in proportion to the tractive effort. It is necessary, therefore, to have a motor of greater capacity than with the series motor to take care of peak load. Regenerative braking may be obtained with any of the three classes of locomotives. It should be applied on locomotives which are to be operated over heavy grades, but for level or light grade sections the advantage will hardly be worth the complication.

Wheel Welding in Terre Haute

FOR two and one-half years M. M. Nash, superintendent of railways and master mechanic of the Terre Haute Division, Terre Haute, Indianapolis & Eastern Traction Company, has been making extensive use of the resistance type of electric welder in reclaiming all manner of car equipment, including interurban car wheels and axles. During this period 2,500,000 interurban car-miles have been operated on the division and only one set of eight wheels has been replaced for flange wear. On all other wheels thin flanges and wheels otherwise worn have been built up and corrected by welding without removing them from the car. Not only have flanges been welded but they have been re-welded, and some of them have mileage records approaching 200,000 miles. These wheels are put out on the road in fairly fast interurban service just as the welders leave them, without any smoothing up, as the company has no wheel lathe in the Terre Haute shop. In exceptional cases a wheel-truing brakeshoe is used for a short time. Mr. Nash says the wheels are sometimes a little noisy when they are first put out on the road, but the rough surface soon smoothes out and he claims he has never had a derailment or flange breakage, more than a small chip, as the result of the welding work. "Railox" electrodes are used for welding the wheel flanges. Where a chip breaks out of the flange it is filled in again, but the projection of the new metal is not smoothed off. This takes care of itself.

A further step recently devised to prolong the life of a pair of wheels, in the absence of a lathe, is the burning off with an acetylene torch of the second flange which sometimes develops on the tread of a wheel. After this burning process is completed no attempt is made to smooth up the tread. The tread and flange are merely permitted to wear smooth in service.

The new Materials Handling Division of the American Society of Mechanical Engineers is planning sessions for the discussion of design and construction of machinery for road building, at the society's spring meeting, to be held at the Congress Hotel, Chicago, May 23 to 26. Four papers will treat this problem from the viewpoint of the contractor, the road builder, and possible future development of mechanical equipment in road building. The work of this division, whose membership is rapidly approaching one thousand, is now well under way.



CURVE SHOWING SPEED-TRACTIVE EFFORT CHARACTERISTICS FOR STEAM AND ELECTRIC LOCOMOTIVES

Removable Tower Used for Making Overhead Repairs



REMOVABLE TOWER IN USE

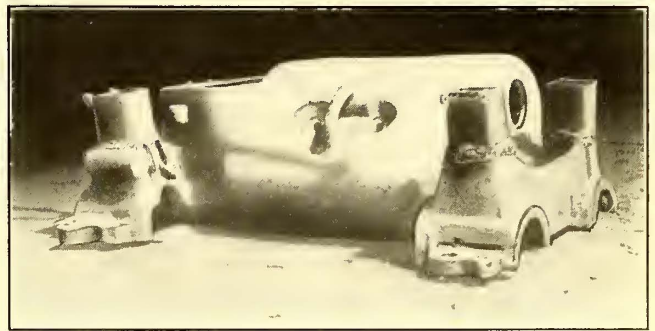
THE accompanying illustration shows a removable tower used by the Edinburgh Corporation Tramways which is bolted to a lorry for use in making overhead repairs and which is readily lifted off when not needed. This leaves the lorry free for other work. This type of tower has also been found very convenient as an aid in the erection of some new overhead runway in the machine shop extension of this road. The tower was bolted to

a low truck to facilitate its being moved about and the overhead railing was removed to provide necessary clearance.

One Way to Enlarge Oil Boxes

THE disadvantage of the small oil box on the frames of old motors such as the GE.-57 has, of course, been recognized for a long time and many ways of enlarging these have been tried.

The Little Rock (Ark.) Railway & Electric Company has some of these motors and has found a novel and satisfactory way of enlarging the oil boxes. Sections of old boiler tubes, 4 or 5 in. long, $3\frac{1}{2}$ in. in diameter, are first squared up and made to fit the opening of the box on the motor frame. The section of pipe is then welded to the motor frame, thus adding considerable capacity to the oil box. A cover, retained with a spring, is then put on top of the section of pipe. This work was started with the use of the two Indianapolis welders which the company has for doing trackwork.



GE-57 MOTOR FRAME WITH SQUARED SECTIONS OF $3\frac{1}{2}$ -IN. PIPE WELDED TO ENLARGE OIL BOXES

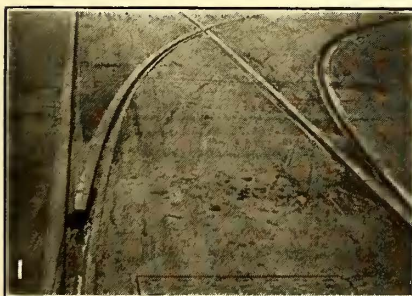
Recently a Wilson motor-generator set was added. This is now used for most of the work in the shop and also for bonding, and the Indianapolis welders are being used for trackwork. In an accompanying illustration is shown a GE-57 motor frame with the enlarged oil box.

Reclaiming a Cast-Steel Mate

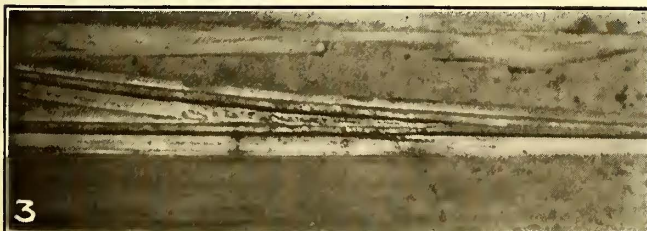
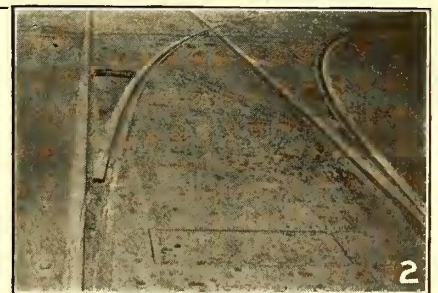
FOUR accompanying pictures illustrate the success which is being obtained in the track department of the Dallas Railway under the direction of B. R. Brown, engineer maintenance of way and overhead construction, in reclaiming bad special trackwork. The particular job pictured shows a cast-steel mate in which a hole was broken down through the casting. The hole was filled up with slugs of iron and soft metal was fused into a solid mass to support the surface welding.

The mate was then built up by means of a hard steel electrode known as the A-steel of the Indianapolis Switch & Frog Company. The plane surface was properly finished by means of a reciprocating grinder and an Atlas rotary grinder was used for shaping up the point and flangeways. This job was done in forty hours by a welder and helper. After being in service for a period of six months the mate showed no signs of deterioration.

Very good success has also been had in welding solid manganese railroad crossings when in extremely bad condition. Mr. Brown says that the secret of this work lies in the mechanic who does the job and that it is simply a matter of knowledge as to how best to handle the metal.



NO. 1—HOLE BROKEN THROUGH CAST-STEEL MATE IN DALLAS. NO. 2—APPEARANCE AFTER HOLE HAD BEEN FILLED WITH SOFT METAL. NO. 3—APPEARANCE AFTER THE MATE POINT HAD BEEN FORMED AND WELDING COMPLETED. NO. 4—THE COMPLETED JOB AFTER GRINDING

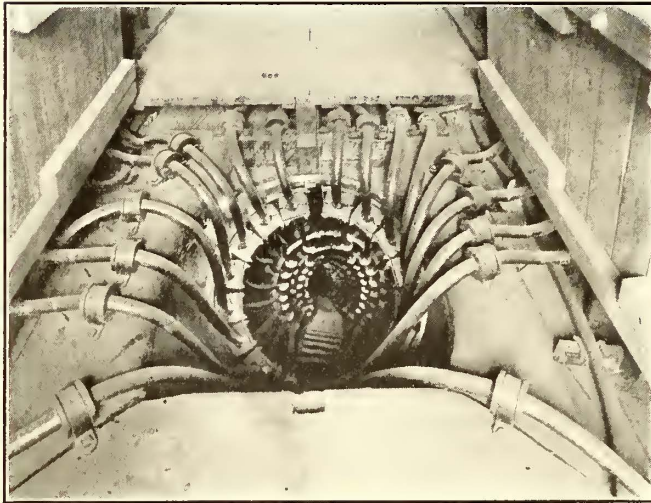


Painting Under Difficulties

Inside of Submarine Pipe Had to Be Painted by Workers in Pipe Using an Air Spray Brush—Work Done at Night, When Power Was Off

PAINTING the inside of a pipe 36 in. in diameter and more than 340 ft. long is a job to be avoided rather than sought, is the probable opinion of the two operators who recently completed such a job for the Connecticut Company at Bridgeport.

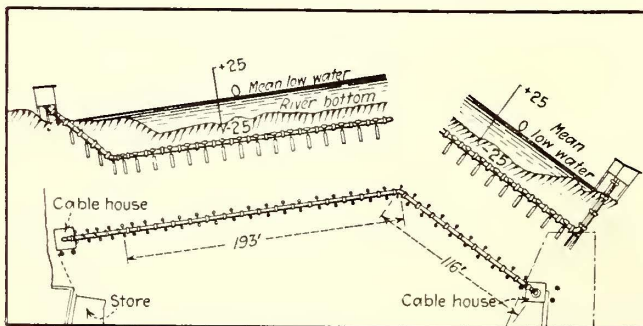
In order to get its feeder cables across the Pequon-



LOOKING DOWN INTO WEST END OF PIPE, SHOWING CABLES MOUNTED ON INSULATORS

nock River at Bridgeport the Connecticut Company in 1906 laid down this 36-in. pipe, as shown in an accompanying illustration. At that time nine 750,000-circ.-mil lead-covered cables were installed, just laying them in the pipe. In 1913 eight 1,000,000-circ.-mil cables were added, and at that time, in order to arrange the cables more satisfactorily in the pipe, they were placed on insulating brackets, as shown in another accompanying illustration. The third illustration shows a view looking down into the top of the 45-deg. section of pipe on the west side of the river.

It was found a few months ago that the inside of the pipe was corroding badly and it was decided to paint it. On account of the fact that it was desired to have the cables remain insulated from the pipe itself it was necessary to use an insulating paint.



SKETCH OF FEEDER CABLE PIPE INSTALLATION, SHOWING RELATION TO RIVER

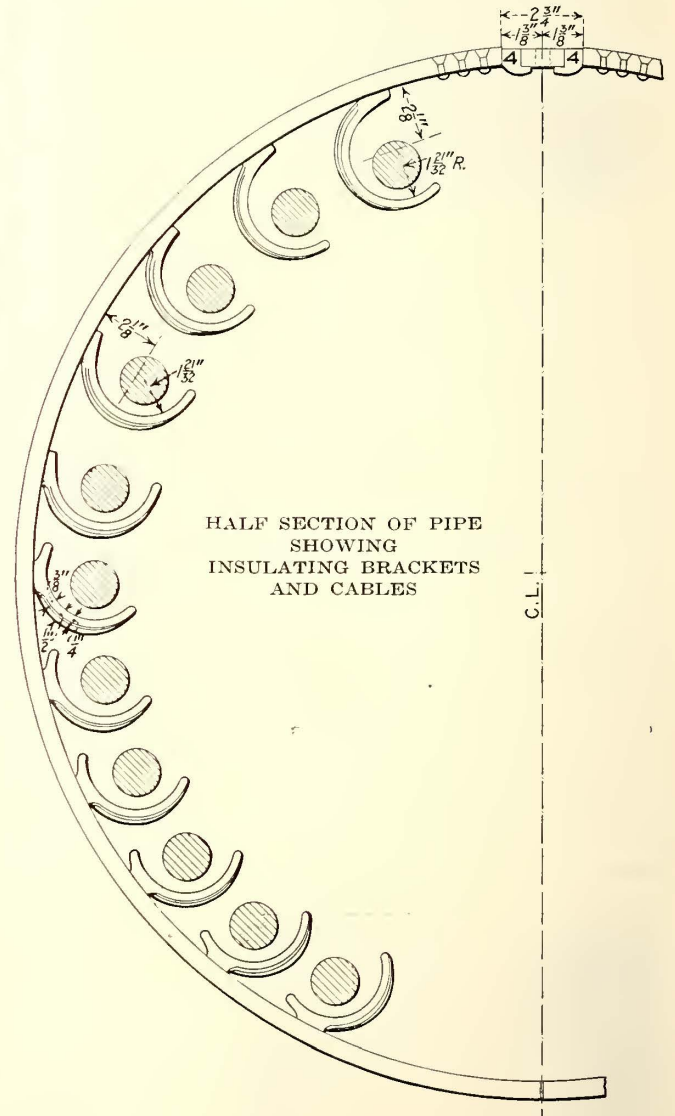
The paint was thinned with gasoline and applied with an air spray brush. The work was done by two men, working four hours at a time at night, when the power was off; they progressed about 45 ft. per night.

When the men approached the point where the ver-

tical section of pipe meets that section which goes directly under the river, which is the lowest point on the whole system, the men were overcome by the gasoline fumes, it having been found impossible to force air through the pipe satisfactorily. After a day or two of rest, they tried it again and were a second time overcome. Strenuous efforts to ventilate the pipe were made, and finally a suction fan was installed, which gave sufficient circulation to allow the men to work in the pipe satisfactorily and finish the job.

About 120 gal. of Sterling insulating paint were used to complete the job.

An interesting sidelight on this installation is that after these cables were installed on the insulating brackets a workman felt a shock, and, upon test, a string of five lamps in series were lighted to full bril-



HALF SECTION OF PIPE SHOWING INSULATING BRACKETS AND CABLES

liancy between the cable sheath and ground. All such tests were made for a period of a minute or more, each time, and no explanation could be found. Finally, one string of lights was left on for several minutes, and it was noted that after about two minutes the lights went out. This was found always to be the case, as the test was applied to other cables, and it was finally decided that there was enough static charge in the cable sheath to maintain this current for that length of time. Accordingly, all cable sheaths were grounded, through 2-amp. fuses, and no trouble has been noted.

Association News

National Electric Railway Day

THE association's advertising section for the committee on publicity reports that the success of the National Electric Railway Day idea far exceeded their anticipations. Much publicity for the industry attended the demonstrations both in the papers and by the film service weeklies. Where there were no demonstrations local papers gave considerable space to stories pertaining to the development of the local traction company.

Of the demonstrations marking the day that of Richmond, Va., the home of the electric railway, is probably the most striking. After several weeks' search the body of one of the cars used on the original electrified line was unearthed, fitted with new trucks and, with the Mayor and other city officials as escorts, was paraded over the streets used by the original route.

Other demonstrations of importance were held in Minneapolis and St. Paul. Here horse car No. 1, which was first put in service in St. Paul on July 17, 1872, was driven through the business section of both cities by the employees who formerly used the car in their daily runs. A score or more persons who also used the car when it was in service again rode as passengers. The trainmen's band led the demonstration, which also showed the growth of the cars used on that system.

Many of the various news film service companies as well as national still life photographers were busy in each of these places obtaining pictures for showing all over the country in the topical news weeklies.

In New Bedford there was also a unique demonstration. The company got out one of the old horse cars and in order to arouse enthusiasm on the part of the public offered a year's free transportation to the oldest person riding on the car. It is understood that there were more than a dozen competitors, the oldest one of whom was 82. The Boston papers gave considerable space to the event.

The papers also took hold of the news features and in many cities a considerable amount of space was given over to the history and development of the local traction company. A particularly good story concerning Reading, Pa., was printed in the local papers. The Eastern Pennsylvania Railways made wide use of the folders and other publicity sent out by the association.

The association's department of publicity has asked the various railways to send clippings and photographs showing what was actually done in their community not merely as a matter of record but for use in helping others to put over similar ideas at a later day.

Car Design Committee at Work

APPOINTMENT by President Gove of the committee of the American Electric Railway Engineering Association authorized at the last convention for the purpose of developing "anticipatory standards" of car design has been made. Under the direction of the chairman, H. H. Adams, superintendent of equipment Chicago Surface Lines, the work of this committee is already well under way. The rest of the personnel of the committee is equally divided between representatives of the car

builders and railway companies, as follows: H. A. Benedict, mechanical engineer Public Service Railway, Newark, N. J.; J. A. Brooks, chief draftsman the J. G. Brill Company, Philadelphia, Pa.; J. W. Hulme, superintendent of equipment International Railways, Buffalo, N. Y.; G. L. Kippenberger, assistant to vice-president St. Louis Car Company, St. Louis, Mo.; John Lindall, superintendent rolling stock and shops Boston Elevated Railway; V. R. Willoughby, assistant general mechanical engineer American Car & Foundry Company, New York.

In a recent interview, Mr. Adams summed up the objects of the committee as being "to develop uniformity of car design out of the chaotic conditions existing at present, and ultimately leading up to the question of standardization." The committee has started out on its work by proceeding to gather information and data covering present practices in car design, limiting itself at first to a study of double-truck closed city car construction. To this end, Mr. Adams prepared a questionnaire which was sent to the members of the committee only, and which will bring back data to the chairman from which a comprehensive compilation of car dimensions can be made and analyzed and summarized. Through the very generous co-operation of the car builders represented on the committee, it will be possible readily to secure accurate data on a wide range of car designs built during the last five years, without having to call upon the railway companies.

After these data are compiled, Mr. Adams plans to call the committee together to make a study of the situation and endeavor to arrive at certain uniform dimensions to be embodied in car design, such as post centers, height and widths of body, side and roof dimensioning and construction, window sizes, seat dimensions and numerous elemental parts. Mr. Adams is of the opinion that it should be readily possible to bring about such uniformity in these details of design that cars of varying lengths can be made by simply adding or subtracting standard sections. Whether a car is of the double-end, center-entrance or Peter Witt type does not enter into the consideration, for each of these types could be built with a large part of the car body made up of the uniform sections.

C. E. R. A. Committees Announced

PRESIDENT A. C. Blinn of the Central Electric Railway Association has announced the following committee appointments for the current year:

Auditing.—Walter Shroyer, chairman, Anderson, Ind.; L. T. Hixon, Indianapolis, Ind.; E. O. Reed, Lima, Ohio.

Annual Transportation.—Bert Weedon, chairman, Indianapolis, Ind.; C. J. Laney, Akron, Ohio; J. F. Starkey, Sandusky, Ohio; W. S. Rodger, Detroit, Mich.; C. O. Sullivan, Lima, Ohio.

Constitution and By-Laws.—Arthur W. Brady, chairman, Anderson, Ind.; Charles L. Henry, Indianapolis, Ind.; F. W. Coen, Sandusky, Ohio; Frank R. Coates, Toledo, Ohio; E. F. Schneider, Cleveland, Ohio.

Finance.—James P. Barnes, chairman; Louisville, Ky.; T. A. Ferneding, Dayton, Ohio; F. R. Coates, Toledo, Ohio; F. W. Coen, Sandusky, Ohio.

Hotel and Arrangements.—S. D. Hutchins, Westinghouse Traction Brake Co., chairman; Harry L. Brown, ELECTRIC RAILWAY JOURNAL; John Benham, International Register Co.; L. E. Gould, Economy Electric Devices Co.; C. Dorticus, General Electric Co.

National Safety Council.—Harry A. Nicholl, chairman, Anderson, Ind.; J. W. Giltner, Akron, Ohio; R. A. Crume, Dayton, Ohio; A. Swartz, Toledo, Ohio.

Publicity.—Harry L. Brown, *ELECTRIC RAILWAY JOURNAL*, chairman; H. J. Kenfield, *Electric Traction*; C. J. Laney, Akron, Ohio.

Resolutions.—Robert I. Todd, chairman, Indianapolis, Ind.; Garrett T. Seely, Youngstown, Ohio; Samuel W. Greenland, Fort Wayne, Ind.

Rules Governing Interchange of Equipment.—John F. Collins, chairman, Jackson, Mich.; F. R. Coates, Toledo, Ohio; F. W. Coen, Sandusky, Ohio; G. B. Dobbin, Akron, Ohio; Harry Reid, Indianapolis, Ind.

Education and Training of Employees.—James P. Barnes, chairman, Louisville, Ky.; H. C. DeCamp, Westinghouse Electric & Manufacturing Co.; Edwin M. Walker, Terre Haute, Ind.

Standardization and Bureau of Standards.—H. H. Buckman, chairman, Scottsburg, Ind.; P. V. C. See, Akron, Ohio; J. W. Osborne, Lebanon, Ind.; G. H. Kelsey, Elyria, Ohio; John Oll, Louisville, Ky.; M. F. Skouden, Anderson, Ind.; Charles Ellis, Cincinnati Car Co.; K. D. Leavitt, Dayton, Ohio; R. C. Taylor, Taylorville, Albion, Mich.

Uniform Changes for Repairs to Interchanged Equipment.—F. W. Coen, chairman, Sandusky, Ohio; J. W. Glendenning, Jackson, Mich.; Harry Reid, Indianapolis, Ind.

Program.—Samuel W. Greenland, chairman, Fort Wayne, Ind.; F. D. Carpenter, Lima, Ohio; H. A. Nicholl, Anderson, Ind.; L. G. Parker, Cleveland Frog & Crossing Co.; H. C. DeCamp, Westinghouse Electric & Manufacturing Co.

Transportation.—Harry Reid, chairman, Indianapolis, Ind.; C. J. Laney, Akron, Ohio; J. F. Starkey, Sandusky, Ohio; W. S. Rodger, Detroit, Mich.; Bert Weedon, Indianapolis, Ind.

Electric Railway Express.—C. J. Laney, chairman, Akron, Ohio; W. S. Rodger, Detroit, Mich.; J. F. Starkey, Sandusky, Ohio; G. K. Jefferies, Indianapolis, Ind.; H. A. Nicholl, Anderson, Ind.

Suppliyen.—E. C. Folsom, Railway Materials Co.; C. B. Arthur, Universal Lubricating Co.; W. D. Hamer, W. D. Hamer Co.; Nic LeGrand, National Safety Car & Equipment Co.; H. C. DeCamp, Westinghouse Electric & Manufacturing Co.; C. F. Wickwire, Ohio Brass Co.; L. G. Parker, Cleveland Frog & Crossing Co.; C. Dorticus, General Electric Co.; Myles B. Lambert, Westinghouse Electric & Manufacturing Co.; J. E. McLain, Trolley Supply Co.; James H. Drew, Drew Electric & Manufacturing Co.; F. N. Root, Root Spring Scraper Co.

Track and Roadway.—F. R. H. Daniels, chairman, Indianapolis, Ind.; T. H. Sundmaker, Springfield, Ohio; L. A. Mitchell, Anderson, Ind.; A. V. Brown, Sandusky, Ohio; H. D. Sanderson, Jackson, Mich.; E. D. Eckroad, Akron, Ohio.

These Ties Have Long Life

SOME facts regarding track laid with cedar ties in 1869 by the Chicago, Milwaukee & St. Paul Railroad were recently reported by the railway maintenance engineer. After fifty-two years about 2,000 of the original ties, or 15 per cent, are still in the track. The ties are in a stretch of 14 miles between North Milwaukee and Cedarburg. During the period mentioned the track has been relaid with several sections of rail, and the ties have also undergone one shifting and shortening.

Auto Transportation in California

Motor Truck and Bus Must Get Permission to Operate for Hire Over the State's Improved Highways—
A Veritable Network of Auto Lines

A MARKED feature of the work of the California Railroad Commission during the year ended June 30, 1920, according to the commission's report, resulted from the development of the state's youngest utility—transportation by motor truck and stage. Given impetus during the war by the demand for added transportation facilities, the auto, both freight and passenger carrying, developed rapidly as a common carrier. California's wonderful road system lent itself to this development. Today the state is served by a veritable network of auto lines, and the demand for operating permits is ever increasing. The extent of this type of service is indicated by the number of certificates issued by the commission. There are about 900 legally established operative rights on file.

The usual mistakes have been made during the course of its development prior to the time jurisdiction was vested in the commission. Inexperienced persons, armed only with a desire to enter the auto traffic field, without any knowledge of the dangers that lurk in all new businesses, without training to fit them for conducting a transportation utility (except ability to drive a truck or car), took advantage of the fact that there was need for additional carriers and entered the lists. The number of transfers of permits authorized by the commission shows better than anything else the fate of the pioneers. Exigencies of the rapidly growing service, resulting from financial needs and traffic demands, which they could not meet, forced them to dispose of their routes. This later development, under the extended jurisdiction of the commission, has been carefully guided. Today the auto transportation field is receiving the most careful attention. Haphazard operation is not possible; permits are issued only on a showing that public convenience and necessity require additional transportation facilities in the district sought to be served. There has been established by this commission a high standard of service by auto carriers, maintained through a system of inspection, that insures for the traveling and shipping public a maximum of safety and comfort and efficiency. Rules and regulations have been designed by the commission for the guidance and control of the public patronized auto, and their enforcement, in the opinion of the commission, will ultimately result in the high standard of service sought.

One of the reasons for this auto transportation development is that in the last nine years the counties of California have spent more than \$125,000,000 on highway development. In this time the state has also spent \$50,000,000, so that now there is said to be in California five times the mileage of hard surface roads that exist in any other state. The climate is conducive to all-year-round automobile travel and electric railways must concede that these two things are bound to increase automotive competition.

Competition, however, is not altogether an urban proposition, for it is possible to travel from San Francisco to Los Angeles, a distance of more than 500 miles, by auto bus. All motor buses operating outside the city limits come under the jurisdiction of the Railroad Commission.

Recent Happenings in Great Britain

From Our Regular Correspondent

Increasing attention attaches in England to the trackless trolley because of the general need for economy and the desire to make haste slowly with respect to expenditures for new undertakings. In London, on the other hand, the co-ordination plan for the transit lines appears to be off for the present. The news, however, all points to the spirit of caution with which changes of all kinds are being approached.

FROM several parts of Great Britain comes evidence of a pending development of the use of the trackless trolley system. For a number of years a few installations of this system have been in successful use in England, but hitherto it has not been largely adopted. Before the war tramway track construction as well as labor were comparatively cheap, so that a tramway could meet expenses though the traffic was not very heavy. The railless car was accordingly used on routes where traffic was really light.

Even in districts of that sort some traction authorities preferred the petrol motor omnibus, partly because it is not confined to fixed routes of travel and partly because there is no initial expenditure on providing and erecting poles and overhead wires. There is also the fact that in many cases Parliamentary powers are necessary to authorize the poles and wires, while, except in the case where a local authority is the operator, no Parliamentary sanction is required to run petrol omnibuses.

TRACKLESS CAR COSTS LOW

All along, however, the trackless electric car could be worked at a lower cost per mile run than the automobile bus, and since the war this difference has been accentuated owing to the fact that the price of petrol has gone up more than the price of electricity.

Some tramway authorities—indeed probably a good many of them—possess Parliamentary powers to construct extensions which have not been carried out owing to the prohibitive cost of track construction. Other tramway undertakings would no doubt during the last two years have sought powers for extensions, but have refrained for the same reason. Most of the contemplated lines would be on suburban routes of light or medium traffic. To meet this case, therefore, the trackless trolley system is having a favorable eye turned on it.

In Bradford especially there is much prospective activity in this direction. There is the drawback that it seems to a local authority even if engaged in working tramways cannot work trackless cars without getting specific Parliamentary authority. Even if this is so, the difficulty is far from insuperable. So far, however, as Bradford is concerned, the powers now exist for the Bradford Town Council has already run trackless trolley cars, and the same is true of several other local authorities. The Minister of Transport has agreed to Bradford Town Council operating one-man railless electric vehicles, so further economy is in sight.

R. H. Wilkinson, the borough tramway manager at Bradford, has designed a car of the sort which will be driven by one electric motor. It is a single-deck car and will seat thirty passengers. To remove objections to the weight of a larger double-deck trackless car, Mr. Wilkinson has got out a design for a six-wheel vehicle. Half the weight is on the rear axle and the other half distributed equally between the other two axles. The seating capacity is twenty-four on the lower deck and thirty-three on the upper, and the overall length is 23 ft. 10 in. A 60-hp. motor will be used.

The Town Council at Leeds, which also already run trackless cars, is about to experiment with a vehicle of this kind fitted with pneumatic tires. It will be double-deck car seating fifty passengers in all. Another novelty is that the drive from the motor will be through the front wheels. In Glasgow it is proposed to proceed with the construction of some authorized tramway extensions, and also to experiment with the trackless trolley system on one route.

The prospect of a co-ordinated development of all methods of London local passenger transportation has again been postponed indefinitely. Sir Eric Geddes, Minister of Transport, stated in the House of Commons on March 21 that a bill for the establishment of a London Traffic Authority had been under consideration by the government but in view of the general need for economy, both in money and in Parliamentary time, it had been decided that it was not desirable to proceed with the bill at present. Moreover, the proposal was so highly contentious that it seemed impossible to deal with it until some of the matters in dispute had been eliminated. Further, it seemed hopeless to carry out the proposal unless the British Exchequer financed it, and that was a matter of great difficulty at present.

TRAFFIC BOARD FOR LONDON

It may be recalled that within the last year or so a select committee of the House of Commons and an advisory committee of the Ministry of Transport after inquiries recommended the constitution of a traffic board for London to co-ordinate services and guide new development. This proposal only confirmed the recommendations of various expert bodies which examined the subject in past years. Broadly it may be said that the transport undertakings of the metropolis are in favor of having a traffic board, but there are so many local authorities and other bodies en-

titled to have a say and there is so much difference of opinion among them that prospects of a solution are not bright. Apart from that the government is now engaged in a great economy campaign. It is cutting down expenditure in many directions, and there is little chance of any new expenditure being sanctioned except for objects that are urgently necessary.

LARGEST BRITISH POWER STATION

One or two interesting points may be cited from the speech of R. P. Sloan, manager of Newcastle-upon-Tyne Electric Supply Company, at the annual meeting which was held on March 22. The company, long a successful one, supplies electricity for many purposes, including traction. Mr. Sloan said that the profits for the year were £392,643, or £144,449 in excess of those for 1919. This was a disappointing year, as the increase was only £50,249 above 1918. The extensions of Carville power station were now completed, making this station, which now had a capacity of more than 130,000 hp., the largest electrical generating station in operation in the United Kingdom. The North Eastern Railway main line electrification scheme had not yet materialized, but negotiations had been re-opened by the railway company and there was reasonable hope that the scheme could be proceeded with although on a somewhat smaller scale than was first contemplated. In the event of the scheme maturing and proving a success there was every likelihood of its leading to much larger developments.

J. H. Armstrong, the chairman, referred to his retirement from that post and said that on his suggestion Mr. Sloan would become chairman and managing director. Mr. Sloan had been manager for more than sixteen years. He came to the company with the birth of the power scheme—the first one to be established in the United Kingdom and he believed in the world—and had nursed it into the powerful and well-developed being it was now. Mr. Armstrong will continue in office as vice-chairman of the company. He received from the meeting tributes of appreciation of his services.

Proposals are being made by Manchester and by some other places to give the local authority power to prevent other vehicles from being driven past tramcars on the nearside when the cars are stopped for setting down and taking up passengers. The idea is to secure the safety of passengers, and though the plan has been worked for some time in Glasgow it seems likely, in the case of streets of very dense traffic, to cause much street obstruction.

Arrangements are being pushed forward for electrifying the whole of the cable tramway system of Edinburgh at an estimated cost of £825,000. The manager is of the opinion that the saving in working expenses will more than cover the interest and sinking fund charges on the new capital.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

Franchise Surrendered

Duluth Street Railway Company Goes Under New Law, but Rejects Cost-of-Service Proposal

The Duluth (Minn.) Street Railway has elected to operate under an indeterminate permit perpetuating the existing franchise grants and permitting fares to be fixed by the State Railroad & Warehouse Commission, under authority of a statute passed by the 1921 Legislature. At the same time the company has announced its intention to reject the cost-of-service franchise, prepared by a committee of Duluth engineers. The company's attorneys hold that the proposed franchise conflicts with the city charter in so far as the provision with reference to rates is concerned.

Request for an indeterminate permit has been filed with the city clerk and under the law recently passed by the Legislature it becomes the duty of that officer to furnish the company with a certificate, which is then filed with the Secretary of State. The city, in turn, is also required to issue the indeterminate permit. Under the proposed engineers' franchise the rates would be determined by means of a contract between the city and the company providing that the fare charged should vary inversely with the dividend rate allowed.

As noted in the ELECTRIC RAILWAY JOURNAL for April 30 the recent legislation gives to the City Council complete control over services, extensions and routing and makes the local governing bodies parties to the valuation proceedings before the state commission. The state commission, however, is given exclusive and initial right to regulate rates, subject to appeal to the courts. Indeterminate permits are authorized to take the place of the present franchises of the railways. These permits, however, are subject to revocation by the Legislature.

In Duluth the company will withdraw its action now pending in the federal court by which it hopes to obtain a temporary injunction against the city from proceeding with an action in the state courts to enforce it to give additional service on several of its lines, providing that the State Railroad & Warehouse Commission looks favorably on an application for an increase in fares.

A. M. Robertson, president of the Duluth Street Railway, has made a statement covering the company's views on the matter of the rejection of the proposed cost-of-service franchise and on its election to proceed under an indeterminate permit. He said in part:

Our attorneys have given us legal opinion that the cost-of-service franchise prepared by the Engineers' Club, with reference to rate of fare, is in direct conflict with the city charter and could not be made operative without an amendment to the city charter. In view of this opinion there is no other course open to the company than to file with the city clerk written declaration that it desires that its existing franchise grants shall become an indeterminate permit under the provisions of chapter 278, laws of Minnesota, 1921.

It is of the utmost importance that the company obtain financial relief through an increase in fare, which will enable it to make necessary permanent improvements, render satisfactory service and give to its stockholders a reasonable rate of return on a fair value of the company's property, as provided for in the state law. The company will, as soon as possible, make application to the Railroad & Warehouse Commission for an emergency or temporary rate of fare pending a valuation of the property.

The officers of the company believe that the new state law affords a foundation upon which its credit may be restored and which will put it in a position to meet the demands of the city for extensions, additional service and permanent improvements, as the same are needed from time to time.

As soon as the company shall receive the needed financial relief through increased revenues it proposes, in co-operation with the City Council, to do first those things for which there is the most pressing demand, and it asks from the City Council and the people of Duluth reasonable co-operation in its efforts to build up the property to its pre-war physical condition.

Injunction Invoked in New Orleans

In anticipation of hostile action by the State authorities to the collection of the present 8-cent fare Receiver O'Keefe of the New Orleans Railway & Light Company petitioned Judge Foster, of the Federal District Court, for a temporary injunction against the Attorney-General and Assistant Attorney-General of the State, enjoining them from bringing suit in any form against the company.

The injunction was granted on April 29, hearing upon the prayer of the receiver's petition having been set for May 3. Decision was expected to be made then whether the injunction will be made permanent or set aside and the State allowed to proceed with the suits which it is alleged Assistant Attorney-General Hall contemplates filing against the company.

The application for a temporary injunction against the State authorities grows out of threats which Receiver O'Keefe alleges Judge Hall, Assistant Attorney-General, has made in the public press and elsewhere of taking action against the railway or some of its units for forfeiture of charters, franchises and rights.

It is further alleged by Receiver O'Keefe that such action is contrary to the decree of Judge H. B. Clayton, issued on April 21, in which the city was enjoined from interfering with the collection of an 8-cent fare by the railway.

Ambitious Missouri Project

Preliminaries Being Arranged for Construction of Electric Railroad from Kansas City to St. Louis

The Missouri Central Construction Company is underwriting and doing construction work on an electric interurban railway to connect Kansas City and St. Louis, 248 miles. The line is to be known as the "St. Louis-Kansas City Short Line." The company has now secured three-fifths of the right of way, and more than 30 miles are now graded. It is said that \$380,000 has to date been put into the project. The company is moving slowly, with a minimum of local publicity through the state and at terminal cities.

Two of the principles governing location of route hold particular interest. The electric line is being located to serve rural Missouri between the terminals, and therefore (1) avoids rather than touches the larger towns; (2) does not parallel closely the steam lines.

The company is not selling stock to farmers, nor offering it to them, in connection with right-of-way negotiations. This policy was taken because of the possible implications that might rest against the company should it make stock subscriptions a condition of route location. It is said that one of the most serious handicaps to present location and securing of right-of-way is the remembrance by farmers of previous similar projects not carried through in connection with which stock was sold to farmers selling land for right-of-way.

The president of the Missouri Construction Company is George R. Collins, president of the National Benevolent Society, a fraternal insurance organization with headquarters at Kansas City. Mr. Collins was active in securing a right-of-way between Kansas City and St. Joseph, Mo., a suit concerning this right-of-way resulting in a judgment under which the Kansas City, Clay County & St. Joseph Railway paid a large sum to Mr. Collins and associates, this company eventually building and operating an electric interurban between the two cities.

Thomas F. Marshall, vice-president of the company, is a capitalist at Marshall. He is active in the work of securing right-of-way. Harvey D. Taylor, secretary, is an attorney. Frank E. Lott, treasurer, is a real estate operator at Kansas City, who has been active for several years in promoting the enterprise. The consulting engineer is W. B. Cauthorn, Columbia, Mo. The right-of-way office is at 501 Finance Building, Kansas City.

Philadelphia Wages Cut

Seven and One-Half Cents Taken Off Trainmen Under Wage Average Plan

Announcement was made on April 28 by the Philadelphia (Pa.) Rapid Transit Company that a general reduction of 7½ cents an hour would be made in the wages paid to the company's trainmen, the reduced wage scale to become effective on May 1. It is also proposed to reduce the wages of track laborers, trackmen, pavers, rammers, switch cleaners and drivers by 14½ cents an hour, this cut also to become effective at once.

The change in wages, it was said, will adjust the company's scale to the average of the scales of the railways in Buffalo, Cleveland, Detroit and Chicago, on which average the Philadelphia scale is based. In three of those cities a reduction in wages has been declared, thus lowering the average for the four. Adjusting the Philadelphia scale to the new average, it is said, will enable the Rapid Transit Company to save \$1,000,000 or more a year. The company's announcement was as follows:

The co-operative plan for collective bargaining of the Philadelphia Rapid Transit Company provides as a basis for determining wages the average of the wage scale of the street railway companies of Buffalo, Cleveland, Detroit and Chicago.

In conformity with the wage decrease of the Cleveland Railway and the Detroit United Railway to be made effective on May 1, 1921, the general committees under the co-operative plan agree that the scale of wages (in cents per hour) of the trainmen of the Philadelphia Rapid Transit Company to be established effective as of May 1, 1921, should be as follows:

Surface motormen and conductors	60, 63 and 65
Elevated motormen	63, 66 and 68
Elevated conductors	60, 63 and 65
Elevated guards	60, 62 and 63

In conformity with the decreases made in Cleveland and Detroit, effective on Jan. 1, 1921, and in Buffalo to be made effective on May 1, 1921, the wage scale of the regular employees of way department track forces, namely: track laborers, trackmen, pavers, rammers, switch cleaners and drivers, should be reduced 14½ cents an hour, effective May 1, 1921.

In conformity with the wage decrease of the Cleveland Railway and the Detroit United Railway the wage rates of other employees who received the increase of 7½ cents an hour, or \$15 a month, effective on June 1, 1920, and those employees who have been engaged at wage rates including the June 1, 1920, increase, should be decreased 7½ cents an hour or \$15 a month, effective on May 1, 1921.

Wage Cut Rejected in Salt Lake

Platform, shop and track employees of the Utah Light & Traction Company, Salt Lake City, Utah, have voted unanimously to reject the proposal of the company to reduce wages, ranging from 14 to 20 per cent. All other conditions of the proposed new working agreement, to run from May 1, 1921, to May 1, 1922, have been accepted by the employees. Arbitration of the wage section of the new agreement has been asked by the employees. H. F. Dicke, general manager of the company, states, however, that the question of arbitration will have to be passed on by the directors of the company. It is

claimed by Mr. Dicke that the arbitration clause in the present contract provides for arbitration of questions concerning the present contract, and does not cover negotiations in regard to a new contract.

The present shop scale is from 50 cents to 68 cents an hour. It was proposed to cut this scale approximately 20 per cent, making it from 40 cents to 56 cents an hour.

At the present time the trackmen are receiving a maximum wage of \$5.25 and a minimum of \$4.50 for a nine-hour day. The company proposes a maximum of \$4.20 and a minimum of \$3.60 for the same length of workday.

Platform men are receiving at the present time a maximum of 64 cents an hour for a nine-hour day. It is proposed to reduce this maximum to 55 cents an hour. The minimum pay of trainmen is 57 cents an hour. This it was proposed to cut to 48 cents an hour. The reductions here are approximately 14 per cent. The proposed minimum of 48 cents an hour would prevail only for first-year platform men, their wage thereafter to be 55 cents an hour.

New Utility Bill Submitted in Illinois

Plans for a radical change in the Illinois public utilities law will probably come to a head in the Legislature of that State in the near future. This is in accord with the campaign pledges made by Governor Small. A draft of the new bill has been submitted and while it is subject to change it is expected to be approved with the important features retained.

Summarized, this bill provides for a repeal of the present public utilities act and abolition of the present commission. It also provides that in case a contract is entered into between a city and a public utility concerning rates or service, this cannot be abrogated except by a majority vote of the people in the city affected. The people of any community would also be permitted to adopt home rule through its council or any governmental commission. Likewise, home rule may be abandoned by majority vote of the people. Any public utilities which are not within a municipality and all public utilities in municipalities which do not adopt home rule are to be placed under the jurisdiction of the Illinois Commerce Commission. This commission would consist of seven members to be appointed by the Governor for terms of four years. There would also be eight assistant commissioners to hold hearings or make investigations. Appeals from the commerce commission would be taken to the Circuit Court of the county in which the case arises.

The Governor has been working in harmony with the Chicago city administration which is endeavoring to form a transportation district with electric railway service based on a 5-cent fare and taxation to make up any deficit which may occur.

Fifteen Cent Reduction

Final Proposition Made by Manager Blinn at Akron—Arbitration Likely

In referring further to a discussion which took place on April 14 between representatives of the Amalgamated and officers of the Northern Ohio Traction & Light Company, Akron, Ohio, in regard to wages to be paid trainmen beginning May 1, A. C. Blinn, vice-president and general manager of the company, said in a communication to the men dated April 22 that the question of wages must be determined not only by the cost of living, but by the company's financial condition. He said that it was his understanding that the proposal made on April 14 had been rejected. A marked reduction from the present wage scale was absolutely necessary. He submitted as final:

1. A straight reduction of 15 cents an hour from the present scale.

2. Submission of the entire question of wages to arbitration if the proposed wage scale was not accepted.

Under the reduction suggested the wages in cents per hour would be as follows:

	City Lines	Suburban Lines	Interurban Lines
First year.....	44	45	50
Second year.....	47	48	52
Thereafter.....	50	51	55
Brakeman.....	50	50	50

Three cents per hour additional over the city scale would be paid for the operation of one-man city cars:

Mr. Blinn further explained that in case the first proposition was accepted the following working condition should prevail:

The company reserves the right to make and change all schedules; said schedules to provide for necessary lay over.

All runs on working schedule shall conform to a ten-hour work day as near as possible.

All runs on working schedule to be not less than eight hours. Working schedule shall not include tripper runs.

Motormen, conductors or brakemen working runs of eight hours or more who are called to work extra shall be paid time allowed plus one hour.

Any motorman, conductor or brakeman assigned for work at a specified time, and if for any reason, not their own, do not start to work at the time specified, shall be paid for the time elapsing between the time they reported and the time they actually started work in addition to time worked.

Any motorman, conductor or brakeman assigned for work at a specified time and on account of the weather or for other reasons, not their own, do not do any work, shall be allowed one hour time for reporting.

Motorman and conductor who properly make out accident report or reports, at the completion of their day's work and same is O.K'd by dispatcher on duty will be paid for one hour's time.

Mr. Blinn further said that in the event the second proposition was accepted the working conditions previously noted should likewise be subject to arbitration, the board of arbitration to settle the question by May 20.

The men rejected the company's arbitration proposal on Tuesday night and threatened an outlaw strike. P. J. Shea, international officer, declared the charter would be taken from the local organization if the men walked out on Thursday as threatened.

\$32,000,000 Terminal Improvement

Electric Interurban and Steam Lines at Los Angeles Ordered to Start Work at Once on New Union Depot

The Railroad Commission of California has ordered the Southern Pacific, Santa Fe, Los Angeles and Salt Lake Railroad Companies and the Pacific Electric Railway at Los Angeles to proceed with the construction of a union passenger station on the Plaza site. Construction of the station, as set forth by the commission, is considered as the first step in a comprehensive plan of transportation development in Los Angeles, embracing the gradual elimination of all the important grade crossings in the city.

THE commission orders that the railroad lines, affected by the order, must name a joint committee in thirty days, while plans for the union depot must be filed within six months. In the event that the committee is unable to agree upon a chairman, this official will be selected by the Railroad Commission.

The commission states that the Pacific Electric's most urgent service and traffic problems dealing with the Hill Street and Hollywood situation are not affected by the present proceedings and nothing contained in same will prevent or need delay a partial or complete solution of these difficulties. Both the Pacific Electric and the Los Angeles Railway, said the commission, will have to make provision for adequate local street railway service to and from the new union passenger depot which is proposed.

In concluding its reference to the terminal controversy, the commission said that, in selecting the Plaza site, it "assumes that the city will carry out its repeatedly announced intention to further in every possible way the consummation of the general plan, which by resolution the city authorities have so strongly urged the commission to promulgate in these proceedings."

The commission indicated that it was not practicable at this time to deal extensively with the matter of cost and division of expenditure, and that these features would be reserved for a subsequent decision. The cost of the Union Station would be much less than that of the entire plan, the commission stated, and the figure would be made known after the plans of the engineering committee have been filed with the commission. The commission declared it was not contemplating an unreasonably large expenditure, and that the Southern Pacific and Salt Lake Roads, and the Pacific Electric Railway contemplated the expenditure of approximately \$17,000,000 for incomplete development.

The campaign for a union terminal in Los Angeles began in the year 1911, following a series of grade crossing accidents in the city and county, and the Railroad Commission was petitioned to order the elimination of grade crossings. Fearing that it lacked full authority to cope with the situation, the commission ruled against itself to get the opinion of a higher court. When an appeal was made to the State Supreme Court the commission was informed that it had full authority in the prem-

ises and that it should lose no time in satisfying its petitioners.

Richard Sachse, chief engineer of the commission, was placed in charge of the work, and with his staff of engineers spent two years in preparing a study and survey of the traffic conditions in the city of Los Angeles. This survey covered more than 1,000 pages when it was finally completed.

At the time Mr. Sachse reported on this union terminal to be located at the Plaza, in accordance with his recommendations, it was stated by him that the completed improvements could be had for \$32,233,445. His report figured grade crossing elimination along the Los Angeles River at \$4,596,000; carrying this work through to Pasadena, \$6,700,000; Butte Street trackage, \$192,000; union passenger terminal and yards, \$10,933,000; union freight station, \$2,575,000; new freight yards, \$2,835,000; doubling tracking from Los Angeles to Colton, \$136,000 (S. P. Lines); team yards, \$629,000; additional trackage, \$710,000; subway and elevated work, \$5,741,000; release of sites, \$2,800,000.

Throughout the proceedings, all three of the steam roads and the Pacific Electric Railway opposed the union passenger terminal proposed. It is apparent that the railroads intend to appeal to the courts before they submit to the commission's orders—that the matter will first be carried to the Interstate Commerce Commission, then to the highest courts of the United States, if necessary, in order to obtain relief from what the railroads term a drastic order of the commission.

Tacoma Company Cannot Proceed with Extensions Now

At a public meeting held in Tacoma, Wash., recently, attended by members of the City Council, officers of the state department of public works, and officials of the Tacoma Railway & Power Company, 300 residents of the so-called Jefferson Square District, lying between Sixth Avenue and the Point Defiance car line, presented their urgent need of extensions to street car service, and received assurances of the city and state officials that the matter would be thoroughly investigated.

E. V. Kuykendall, state director of public works, stated that the state engineering department would take any action found necessary by the investigation. Tacoma Railway & Power Company officials present explained

that the company had been unable to extend the line because its returns were insufficient.

N. L. Robbins, statistician of the company, presented figures to show that the cost of operating one extension of the line would be \$51 a day, with estimated income of \$20.36. He pointed out that since 1918 the company has been trying by various means, such as bus and stage lines, to cover this district, all efforts being financially unsuccessful. Richard T. Sullivan, manager of the company, stated that during the year 1919 the company lost \$103,000 in operating its lines in Tacoma and that while the present outlook was more hopeful the company could not be burdened with any further expenditures until returns had begun to show an increase. He expressed his willingness to co-operate in any way to secure the extensions.

Strike Narrowly Averted

Walkout of Detroit United Employees Put Off for Week Pending Resubmission of Pay Cut

After employees of the Detroit United Railway had voted eight to one in favor of suspension of work and the City Council had met with the Mayor to consider the situation a conference between the company officials and the representatives of the four unions resulted in a truce which averted for at least one week the threatened tieup.

At the conference the day before the company's proposed reduction of 20 per cent to 28 per cent in its platform men's wages was to go into effect an agreement was reached whereby the company agreed to postpone for one week the posting of bulletins announcing the wage reduction. In event the men accept the company's proposal at the end of the week the reduced rate will be retroactive from May 1.

After a conference the president of the Amalgamated Association and company officials expressed the belief that the questions voted on by the men had not been thoroughly understood when they voted to reject the proposition submitted to them and empowered the joint committee to call a strike. The propositions on which the men voted are:

1. Do you favor acceptance of the company's proposed working agreement based upon the Cleveland agreement calling for a wage scale of 55, 58 and 60 cents an hour?
2. Do you favor submitting the entire question of wages, hours and working conditions to a board of arbitrators?
3. Do you authorize a suspension of work, if necessary?

According to a report on the ballot, 273 of the union members voting favored the first plan, 154 were in favor of arbitration according to proposition number 2, and 3,321 voted to authorize a walkout.

The vote Saturday is the outcome of negotiations carried on by the company and the men since the company announced its proposed wage cut from 70, 73 and 75 cents an hour to 50, 55, and 60 cents an hour, effective on May 1.

The unions voted unanimously to reject the cut and offered to arbitrate the question of wage reduction only. The company in turn insisted that any arbitration must include the entire working agreement between the company and the unions. No agreement being reached the company offered a new plan based upon the Cleveland wage scale of 55, 58 and 60 cents per hour.

Announcement by Mayor Couzens that the street railway commission would reduce the wages of employees of municipal lines from 70, 73 and 75 cents an hour to 55, 58 and 60 cents an hour was followed by a vote of the city employees to follow the union lead.

It will be explained to the men that the offers made by the company are the only conditions that can be secured without a strike. With this in view the representatives of the union asked the company to withhold the bulletins for seven days and leave the proposition that they had submitted stand for the men to consider and ballot on again. To this the company agreed.

Elevated Men Accept Cut

New Agreement between Trustees and Amalgamated Involves Reductions to Take Effect in Installments

The trustees of the Boston (Mass.) Elevated Railway have entered into a new agreement with their employees who are members of the Amalgamated Association, involving wage reductions of from 7 to 10 per cent, effective during the twelve months beginning July 1. For blue uniform men who have reached the senior grade of pay—after one year's service—the reduction is to be 7 per cent, divided into two parts, approximately half the reduction being applied July 1, and the balance Jan. 1, 1922. For the balance of the employees under the Amalgamated agreements the straight reduction of 10 per cent will be effective July 1.

As practically all the blue uniform men now employed are of the senior grade, the company will only save about 3 per cent on trainmen's wages during the first six months of the new agreement. It is estimated that the total savings to the company, under this new agreement will be approximately \$1,000,000 during the twelve months. The total wages for 1920 were \$17,216,445.

A considerable number of employees who are working under agreements of the various skilled crafts unions are not affected by this new wage scale, but as their various agreements expire it is not unlikely that they may be renewed with moderate reductions in wages to conform to labor market conditions in Boston.

The negotiations attendant upon the formation of this new agreement were unique because of their brevity and harmonious character. After brief preliminaries between the officials representing the company and the men, the wage proposals were submitted to vote of the union membership and accepted without dissent in less than two days.

The old agreement expires, as far as wage scale is concerned, July 1, and sixty days' notice is required of either party of any desire to change any portion of the agreement.

The wage scale (in cents per hour) for blue uniform men as at present and as agreed for the next year follows:

	SURFACE TRAINMEN		
	Present	July 1 to Jan. 1	Jan. 1 to July 1
Minimum (3 months)...	58	52	52
Intermediate (9 months)...	64	58	58
Maximum (thereafter)...	70	68	65

Operators of one-man cars are to receive a differential of 10 cents an hour, instead of 15 cents as at present.

It is expected that other than the wage scale, the old agreement will be renewed without any important changes in working conditions. Minor

	MOTORMEN—RAPID TRANSIT TRAINS		
	Present	July 1 to Jan. 1	Jan. 1 to July 1
Minimum (3 months)...	65	61	61
Intermediate (9 months)...	66	62	62
Maximum (thereafter)...	72	70	67

	GUARDS—RAPID TRANSIT TRAINS		
	Present	July 1 to Jan. 1	Jan. 1 to July 1
Minimum (3 months)...	62	56	56
Intermediate (9 months)...	63	57	57
Maximum (thereafter)...	65	63	60

matters are now being negotiated. The 8-hour day with 60 per cent of all runs coming inside an 11-hour spread is in effect. The trustees issued the following statement to the men as indicative of their policy:

In reaching this conclusion the trustees have given consideration and weight:

1. To the fact that although a substantial decrease has already taken place in many items affecting the cost of living that cost is not yet upon any settled basis so that it is peculiarly a fitting time to put in practice the belief of the trustees that to be consistent they should be as deliberate and conservative in following the cost of living when it is upon a downward trend as in following it when it is in an upward movement.

2. To the fact that the trustees thoroughly appreciate the co-operation that the men have given to the management during the past year which has made possible what would otherwise be impossible in the saving of expenditures amounting to large economies; in other words the existence of the spirit which has financial as well as other value in the conduct of this service.

3. The fact that as public officials they are in charge of a public business entirely disconnected from any private or competitive industries and that in this attitude they should be careful not to adopt as a standard for the payment of compensation any other rule than that of a full fair wage for work that is earnestly performed.

Wages Reduced in Lexington.—

Wages of motormen and conductors employed by the Kentucky Traction & Terminal Company Lexington, Ky., have been reduced 5½ cents an hour. The reduction was made through agreement between A. A. Babblitz, Lexington, arbitrator for the men, and George MacLeod, Versailles, arbitrator for the company. The negotiations were based, it was stated, upon an agreement between the men and the company which provided for changes in the wage scales in accordance with cost of living increases and decreases as reported by U. S. Department of Labor. The minimum wage under the new agreement is 38½ cents an hour and maximum 41½ cents.

Strike Averted

Eastern Massachusetts Company and Employees Agree to Arbitrate Wages and Other Details

Through concessions made at practically the last moment by both the company and the employees, the expected strike on the lines of the Eastern Massachusetts Street Railway failed to materialize on May 2 as anticipated. The important question of the handling of discipline cases was settled in conference, and with this point finally agreed upon, both sides consented to leave the question of wages and other details to the Massachusetts State Board of Conciliation and Arbitration. The company withdrew its demand for settlement on the open shop basis, in view of the agreement on the discipline question.

A three-cornered agreement has been made between the company, the employees and the State Board, looking toward a prompt hearing and settlement of the entire problem. James H. Vahey, the attorney for the Amalgamated Association, is to take not more than two days to present the case of the employees, the company is to have the next two days, and the State Board in turn has agreed to render its decision on or before Saturday, May 14. Many of the minor points of the new agreement were settled in conferences.

The handling of discipline and discharge cases was the stumbling block which kept both sides from getting together sooner. Under the old agreement, the trustees found themselves embarrassed in maintaining discipline, due to the fact that any man discharged by the company could go before his local union, demand arbitration and secure it on a favorable oral vote. In its practical application, this meant that the management had before it the likelihood, if not certainty, of arbitration in every discipline case.

In the new agreement, a man who is discharged will have the right of appeal to the assistant general manager. If dissatisfied with his decision, he may appeal to the labor committee, consisting of four members named by the vice-president, the assistant general manager, the general counsel and one of the trustees. Failing to be satisfied with their decision he may go before his local union and request arbitration. If his union sustains him, by ballot, his case is first to be reviewed by Trustee Wadeigh and Attorney Vahey, who will make a report on it. If they report against the man or disagree, another referendum vote of the local union is required before the actual arbitration proceedings are undertaken.

This procedure is designed to permit of the most thorough review before resorting to the expense of an arbitration.

It was not until this point was settled on the above described basis, on Saturday, April 30, that both sides agreed to leave the wage scale and other contested questions to the State Board of Arbitration.

Franklin Medal to Frank J. Sprague

The Franklin Institute of the State of Pennsylvania will hold a meeting on May 18 for which an interesting program has been arranged. A certificate of honorary membership will be presented to John J. Pershing, General of the United States Army. M. Jusserand, the French Ambassador, will be presented with the Franklin Medal and certificate of honorary membership on behalf of his government for Professor Charles Fabry, University of Paris. Frank J. Sprague will also be honored with the Franklin Medal and certificate of honorary membership. After other honors have been conferred papers will be read. "Studies in the Field of Light Radiation," prepared by Charles Fabry, D.Sc., will be read by Joseph S. Ames, Ph.D., the Johns Hopkins University, Baltimore, Md., followed by "Electric Traction—A Review," by Frank J. Sprague.

News Notes

Accept Wage Cut.—Employees of the Auburn & Syracuse Electric Railroad, Auburn, N. Y., have decided to accept the 25 per cent wage reduction pending settlement by a board of arbitration. The possibility of a strike is now averted. Conferences will continue between the railway and men and an agreement may be reached before arbitration proceedings are started.

Bus Company Makes Improvements.—The Central Auto Stage Terminal, a company organized by twenty-one motor stage lines operating eighty stages out of Seattle, is remodeling a two-story masonry building at Western Avenue, Madison, Post and Marion Streets, from which approximately 5,000 passengers will be discharged and loaded daily. The company is expending \$20,000 in improvements to the structure.

Arbitration in Syracuse.—It has been announced that arbitration will be resorted to in the wage dispute on the Rochester & Syracuse Electric Railroad, Syracuse, N. Y. T. C. Cherry, vice-president of the road, and union officials have agreed on the manner of selecting arbiters and names will be announced soon. The wage adjustment will be similar to that under which the New York State Railways' wage dispute is being settled.

More Employees Accept Cut.—Conductors and motormen of the Bay City division of the Saginaw-Bay City Street Railway voted to accept a reduction of 10 cents an hour in their pay from May 1. The action was voluntary on the part of the men, who said they realized that the jitney bus competition, practically unregulated by the city, had so reduced the revenues of the

company that they could no longer pay rates under which they had a working agreement.

Arbitration in Des Moines.—The Des Moines City Railway has appointed B. F. Elbert as its representative on the arbitration board which will decide the wages of its trainmen for the coming year. The railway men's union has its representative also in line and it is expected that a third arbitrator will not be needed. This will be the seventh arbitration committee which has been formed since 1905 to settle disputes between the railway and its men. The employees recently rejected the company's wage offer which placed the maximum wage at 60 cents.

Court Hears Attack on Commission.—Justice McAvoy in the special term of the Supreme Court on April 27 heard argument made by Hiram W. Johnson, as special counsel for the city of New York, to restrain George McAneny, Major-General John F. O'Ryan and Le Roy T. Harkness, from acting as transit commissioners in New York City. Mr. Johnson also seeks an order restraining the newly appointed commissioners from taking over the books, papers, etc. Decision in the matter was reserved. Justice McAvoy allowed the attorneys five days in which to submit briefs.

Programs of Meetings

American Society of Mechanical Engineers

The Western Society of Engineers is co-operating with the Chicago committee in the preparation of a program to be presented at the spring meeting of the American Society of Mechanical Engineers at Chicago, May 23-26. This session will be devoted to a consideration of the problems of Chicago as the Rail-Water Gateway of the Middle-West.

This revelation of the magnitude and complications of one of the world's greatest railroad centers will be of vital importance. The program will be supplemented by an address on the Development of the St. Lawrence Waterway. The titles of the addresses follow:

"The Relation of Steam Roads to Rapid Transit Development," by Bion J. Arnold.

"The Function of the Terminal Survey," by J. R. Bibbins.

"Some Aspects of the Problem of Chicago as the Mid-Interior Rail-Water Gateway," by J. R. Bibbins.

"Freight Tunnel System as a Terminal Distribution Agency," by J. R. Bibbins and E. J. Noonan.

"Development of Air Rights in Connection with City Freight Houses," by E. J. Noonan.

"Freight Movement by Motor Trucks, View Point of Carrier and Public," by Hugh E. Young.

Well developed programs will be presented by the Professional Divisions of the Society devoted to forest products, fuels, machine shop, management, material handling, power, railroad, and a specially important session will be devoted to Training for Industries.

H. B. Reynolds of the Interborough Rapid Transit Company, will present the results of a series of tests on a

30,000 kw. General Electric steam turbine installed at the Fifty-ninth Street power house of the Interborough Rapid Transit Company, New York.

Southwestern Electrical & Gas Association

At the opening session of the seventeenth annual convention of the Southwestern Electrical & Gas Association at Galveston, Tex., on May 18 the president's address and report of the secretary will be heard. On May 19 at the first session of the Street & Interurban Railway Section "problems of the minute" in electric transportation will be discussed. On the afternoon of May 19 the first general session will be held at which speakers of prominence in the utility and scientific field will make addresses and answer inquiries. Among these will be Martin Insull, "The Public's Business," J. H. Gill, "The Utility Association as a Permanently Profitable Investment." At the second meeting of the Street & Interurban Railway Section the usual "Round-the-Table" session will be held. This informal "get-together" method where no technical papers are read but where the members discuss freely the status of the electric railways covered by this association (Texas and Louisiana) has proved very successful. At the second "general" session W. G. Busby, chairman, Mo. Public Service Commission, will read a paper, "State Utility Commissioners." There will also be two addresses on "Hometown Financing of Local Utilities," by those who have had recent practical experience in this matter and an address—from the banking side—on the same subject by a Texas banker.

International Street & Interurban Railway Congress

A meeting has been called to begin May 29 and end June 3, 1921, in Vienna of the International Strassenbahn und Kleinbahnverein, recently organized in Nuremberg. Papers are scheduled on the following topics:

(1) Roller bearings in street railway operation, (2) economic condition of steam railroads, (3) relation between cars and tracks, (4) outlook for the light railway, (5) co-ordination of traffic facilities in large German cities, (6) standardization and maintenance, (7) the Copenhagen street railway, (8) technical difficulties in operating a railway in Amsterdam, (9) car construction, (10) ball bearings for trolley cars, (11) psychological tests for employees, (12) proposed electric line in Christiania, Norway, (13) fares and headways and their effect on receipts; (14) high-tension direct-current railways; (15) mercury-arc rectifiers and automatic substations, (16) trackless trolleys, (17) one-man car operation.

The secretary of the association is Dr. Arthur Ertel, Favoritenstrasse 9, Vienna. The president of the association is Ludwig Spängler, general manager, Vienna Municipal Tramways.

Financial and Corporate

Twin City Earnings

Company Is Able to Increase Dividends Nearly 7 per Cent Gain in Traffic

The annual report of the Twin City Rapid Transit Company, Minneapolis, Minn., for the year 1920 indicates an improved financial condition over 1919. The net earnings of the company for the year were sufficient to declare a 3 per cent dividend on the common stock, in addition to the regular dividend on the 7 per cent preferred stock.

The accompanying tables give in detail the income account for the year in comparison with the year 1919. The percentage change is also shown. Details of the traffic handled and other miscellaneous statistical information are given in another table.

During the year the basic fare in both St. Paul and Minneapolis was raised to 6 cents. This rate became effective in Minneapolis on Aug. 16 and in St. Paul on Sept. 13. These increases in fare were made necessary by a substantial increase in wages to the men on the cars. A substantial increase in service was also made to meet

the demands of the cities in return for the right to change the basic rate of fare. Practically 1917 schedules are now in operation. The results for the year, so far as traffic was concerned, were better in Minneapolis than in St. Paul.

The physical condition of the property is being improved as rapidly as the finances of the property will permit, and it is anticipated that the property will soon be restored to as good a physical condition as existed prior to the war. Cars are being remodeled to provide front exits, for which there is a public demand. Other cars are being rebuilt for trailer operation to facilitate handling rush-hour traffic more economically than with single-car operation. During 1920 nearly 13 miles of track in the downtown districts were laid in enlarging the loop facilities. The expenditure for these extensions has been justified by the company being better able to reduce congestion during the rush hours.

During the year ten-year gold notes were issued by the subsidiary companies, namely, the Minneapolis Street

Railway, the St. Paul City Railway and the Minneapolis & St. Paul Suburban Railroad, as evidence of their indebtedness to the holding company, the Twin City Rapid Transit Company. These notes total \$9,850,000 and are to be held in the treasury of the Twin City Rapid Transit Company until such time as the condition of the money market and the earning power of the subsidiary companies warrant their being offered to the public for general investment.

Return of Trolleys to Steam Road Urged

Return of the stock of the Connecticut Company, now held by federal trustees, to the New York, New Haven & Hartford Railroad, its former owners, was urged by Vice-President Edward G. Buckland of the railroad at a hearing on a resolution containing such provisions on April 27 before the committee on railroads of the Connecticut Legislature.

Mr. Buckland said that the electric railway company's lines would continue to be operated "if they could be made to pay"; and stated that the future of the lines, so far as their operation was concerned, would not be affected one way or the other by the proposed transfer of the stock.

A history of the trusteeship was briefly outlined by Mr. Buckland. He told of the action initiated against the New Haven railroad in 1908 for alleged violation of the Sherman anti-trust law; of how the suit was dropped during the Taft administration and renewed under Wilson in 1914. The "New Haven" road then agreed to the separation of the Connecticut Company because it did not wish to jeopardize certain pending financing. Mr. Buckland read an extract from a report by Howard Elliott, then president of the road, to the stockholders in which he pointed out that the road consented to the separation only under financial pressure.

Richard T. Higgins, chairman of the Public Utilities Commission, said he believed that a public utility operating only within the state should be under the supervision of a state body and not of the federal government, adding that the stockholders who were most interested in the prosperity of the lines should be vested with responsibility and control.

George D. Watrous, New Haven, counsel for the trustees, said that the trustees did not think it necessary to appear before the committee but he gave assurance that most of them would carry out an order to release the Connecticut Company's stock.

While Mr. Watrous and Mr. Higgins were disagreeing as to the possibility of the trustees disposing of the company's physical property, Mr. Buckland interposed the suggestion that a sale of the stock might result in the acquisition of the company's property by interests "even more undesirable than the New Haven Railroad."

INCOME STATEMENT — TWIN CITY RAPID TRANSIT COMPANY

Year Ended Dec. 31	1920	1919	Percentage Change
Revenue from transportation.....	\$12,879,281	\$11,351,739	13.5
Revenue from other railway operations.....	107,125	90,705	18.1
Total railway operating revenue.....	\$12,986,406	\$11,442,444	13.5
Way and structures.....	1,234,266	1,102,568	11.9
Equipment.....	1,475,076	1,245,070	18.5
Power.....	1,185,182	1,175,293	0.8
Conducting transportation.....	4,652,777	3,788,711	22.8
Traffic.....	43,561	62,450	30.2
General and miscellaneous.....	1,229,237	1,090,668	12.7
Transportation for investment-credit.....	25,266	19,702	28.2
Total railway operating expenses.....	\$9,794,834	\$8,445,059	16.0
Net operating revenue.....	\$3,191,572	\$2,997,385	6.5
Taxes assignable to railway operation.....	1,161,507	1,126,338	3.1
Operating income.....	\$2,030,065	\$1,871,047	8.5
Non-operating income.....	84,332	51,034	65.3
Gross income.....	\$2,114,397	\$1,922,081	10.0
Rent from leased roads.....	3,000	3,000	—
Interest from funded debt.....	1,080,684	1,087,446	0.6
Net loss miscellaneous physical property.....	21,264	32,829	35.2
Miscellaneous debits.....	10,349	10,454	1.0
Total deductions from gross income.....	\$1,115,297	\$1,133,729	1.6
Net corporate income transferred to profit and loss.....	\$999,100	\$788,352	26.8

STATISTICAL INFORMATION—TWIN CITY RAPID TRANSIT COMPANY

Year Ended Dec. 31	1920	1919	Percentage Change
Total miles, first main track.....	249.79	243.07	2.9
Total miles, second main track.....	184.82	177.40	4.2
Total single-track miles (all tracks).....	466.86	452.65	3.1
Average total trackage operated per year (miles).....	454.17	451.70	0.5
Revenue passengers carried.....	238,388,782	222,186,823	7.3
Transfer passengers.....	77,531,776	73,458,262	5.5
Total passengers carried.....	315,920,558	295,645,085	6.9
Gross passenger revenue.....	\$12,792,277	\$11,179,535	14.4
Gross passenger revenue per mile of line (average for year).....	\$53,969	\$47,303	14.1
Gross passenger revenue per mile single track.....	\$28,166	\$24,750	13.8
Average fare:			
Per revenue passenger (cents).....	5.37	5.04	6.6
Per total passenger (cents).....	4.05	3.78	7.1
Operating ratio (per cent).....	75.40	73.70	(b) 1.70
Taxes (per cent of gross revenue).....	8.90	8.90	(b) 0.74
Dividends paid:			
7 per cent on preferred stock.....	\$210,000	\$210,000	....
On common stock (a).....	\$660,000	\$550,000	20.0

(a) 3 per cent in 1920. 2.5 per cent in 1919. (b) Difference in points. Italics indicate decrease.

Canadian Road Does Well

Ten Per Cent Increase in Net Revenue Allows British Columbia Electric Railway to Pay Dividends

The annual report of the British Columbia Electric Railway, Ltd., Vancouver, B. C., for the year ended June 30, 1920, recently issued, reflects the prosperous financial condition of the country for that period. As a result of the increased population and trade expansion, the revenues of the company increased so that the annual gross receipts were the largest in the history of the company. Despite the heavy increases in the cost of operation and a proper allowance for depreciation, it was possible to declare reasonable dividends free of income taxes.

The growth of population has necessitated a substantial expenditure of capital during the past year. Past financial management has enabled the company to meet this expansion with-

abolition of the Public Utilities Commission.

The net income transferred to profit and loss from operation and other sources during the year amounted to £590,971 as compared with £530,327 the previous year. Adding the balance of the previous year gives a total revenue of £418,585 as against £369,105 in 1919.

\$466,159 Profit for Interurban

The annual report of the Utah-Idaho Central Railroad, Salt Lake City, Utah, shows a net profit of \$466,159 for the year 1920. This is \$199,277 less than the 1919 figure. The company operates 117 miles of road.

The report shows total operating revenue of \$1,056,001 and total operating expenses of \$690,815. The operating revenue was \$60,871 more than received in 1919, and the operating expense was \$26,259 less than it was the year before.

The total investment is \$5,221,900.

Monongahela Valley Succeeds

6 Per Cent Paid on Preferred Stock and More Than \$1,000,000 Put Into Property

According to the annual report of the Monongahela Valley Traction Company, the year ended Dec. 30, 1920, was considered to have been a reasonably successful one. The company formerly was engaged solely in the transportation service, but at the present time the railway revenues, amounting to approximately \$2,610,000, are only 44 per cent of the total; electric power sales produce 13.4 per cent, while gas production and coal mining operations provide the balance.

Eight one-man safety cars were purchased and installed in Clarksburg, W. Va., during the year. These cars cost \$50,000, or about \$6,250 each.

In the latter half of 1920 the company, according to the report, did not have sufficient railway equipment to carry all of the passenger traffic offered and this demand can only be met through the purchase of additional equipment and extensions to the railway lines. In view of this situation, the company officials believe that certain rates now charged can be advanced so as to permit the company more nearly to earn a fair return on its investment and thereby enable it to market securities with which to provide capital for necessary betterments and improvements.

Sunbury Line Sold Under Foreclosure

Bondholders of the Sunbury & Susquehanna Railway, Sunbury, Pa., represented by John W. Whitaker, on April 25 bought the property at receivers sale for \$55,000. This includes 6 miles of line operating between Sunbury and Selinsgrove and a mile opposite the Pennsylvania Railroad yards North of Northumberland, and known as the Sunbury, Lewisburg & Milton Railway. The property has been in the hands of receivers for eight years.

Brooklyn Earnings Improving

The Brooklyn (N. Y.) City Railroad, formerly included in the system of the Brooklyn Rapid Transit Company, recently issued a statement of income for February, 1921, compared with February, 1920. Income figures covering the period of July, 1920, to February, 1921, also were announced. The earnings reported are shown in the accompanying table.

STATEMENT OF INCOME—BRITISH COLUMBIA ELECTRIC RAILWAY, LIMITED

Year Ended June 30—	1920	1919	Per Cent Change
Net revenue, including profit on exchange and less depreciation in securities	£609,045	£530,182	14.8
Registration fees, etc.	318	145	119.3
Total revenue	£609,362	£530,327	14.9
Charges against revenue during the year			
Depreciation, sinking fund and renewals	£164,745	£154,727	6.5
Office rent, salaries, printing, legal, audit and agency expense	18,413	9,898	86.1
Trustees' fees	877	864	1.5
Corporation profits tax	13,000	.....	.....
Capital amortization fund	.....	1,818	.....
Total charges	£197,035	£167,307	17.7
Net revenue for the year from all sources	412,327	363,020	13.6
Add revenue from previous year	6,258	6,085	2.9
Gross income	£418,585	£369,105	13.4
Deductions—			
Interest and debentures and debenture stock	132,339	132,447	— 0.08
Dividend (5%) on perpetual preference stock	72,000	72,000	.....
Interim dividend on preferred ordinary stock with income tax thereon	65,032	36,000	80.5
Dividend on deferred ordinary stock with income tax thereon	£115,200	£86,400	33.4
Dividend on preferred ordinary stock with income tax thereon	21,368	36,000	— 40.6
Total deductions	£405,939	£251,058	61.7
Balance to carry forward	£12,646	£6,258	101.9

TRAFFIC STATISTICS—BRITISH COLUMBIA ELECTRIC RAILWAY, LIMITED

	1920	1919	Per Cent Change
Passengers carried	66,411,030	53,326,288	24.5
Tons of freight carried	430,931	331,794	30.0
Freight cars interchanged with steam railroads	9,861	7,463	32.1
Light and power customers added	3,981	.....	.....
Kilowatt-hours of energy sold	116,196,981	94,953,424	22.4
Cu.ft. of gas sold	545,191,200	431,093,000	26.5

out having to issue additional securities. It was possible only because the debentures are irredeemable and consequently a considerable part of the provision for co-depreciation has accumulated in cash and is now being utilized for necessary extensions and developments. Had the debentures been redeemable, much of the provision made for depreciation would have been absorbed by the reduction funds, and it would have been necessary to ask for additional capital to meet the extensions in the community served.

Existing fares, the company says, were granted to enable it to meet the increased cost of operation, including higher wages. It is still necessary for the continuance of railway operation on an efficient basis that there should be some authority to whom appeal can be made to sustain or increase if necessary rates and fares in view of the

The total amount of stock issued was \$1,426,640. The funded debt outstanding at the close of the year was \$3,735,000.

During the year the road carried 1,036,727 passengers. Three passengers, twenty-five employees, and one other person were injured during the year and one employee was killed. The 371 persons employed during the year received \$409,788 in wages.

INCOME ACCOUNT—BROOKLYN CITY RAILROAD

	Feb. 1921	Feb. 1920	July 1, 1920 to Feb. 28, 1921
Passenger revenue	\$777,236	\$693,780	\$6,345,329
Other revenue	27,256	23,452	242,045
Total	\$804,492	\$717,232	\$6,587,374
Operating expenses and taxes	753,459	773,585	7,039,877
Gross income	\$50,033	\$43,647	\$452,503
Income deductions	58,573	71,560	456,491
Net corporate income	\$7,540	\$12,793	\$908,994

NOTE:—Italics denote deficit.

Depreciation in San Francisco

Table Showing Full Depreciation Allowances for Municipal Railway and United Railroads

In the last issue of this paper a letter was published from the chief engineer of the city of San Francisco referring to the way in which the depreciation accounts for the Municipal Railway and the United Railroads of that city were treated in one of three tables published on page 697 of the issue of this paper for April 9. While the figures as printed were correct, they

addition to the sum included in the maintenance accounts. The wording of a footnote in the table as printed may have given the impression that the latter amount was the total amount charged to depreciation.

The accompanying table is a reprint of the table in question except that the sum of \$550,000 charged by the United Railroads to its depreciation reserve is now included in the operating account and the percentages and other figures are changed to fit this plan.

In connection with the above analysis of the operations of the Municipal Railways of San Francisco M. M. O'Shaugh-

Cleveland Traffic Decreasing

The report of the Cleveland (Ohio) Railway for March showed an ordinance surplus of \$41,335, of which \$28,234 was a tax refund due to a reduction in the company's valuation ordered by the state tax commission following a lengthy dispute. This ordinance surplus reduced the deficit in the company's interest fund, which is the fare barometer, from \$53,425 to \$12,090.

During March the company over-expanded its maintenance allowance by \$19,686, making the total current deficit in the maintenance, depreciation and

COMPARISON OF OPERATIONS—YEAR ENDED JUNE 30, 1920

	United Railroads of San Francisco					Municipal Railway of San Francisco				
	Actual	Per C.-M. Cents	Per C.-H.	Per Cent of Operating Revenue	Per Cent of Operating Expense	Actual	Per C.-M. Cents	Per C.-H.	Per Cent of Operating Revenue	Per Cent of Operating Expense
Passenger revenue.....	\$8,938,987	34.85	\$3.08	99.30	.....	\$2,702,289	36.41	3.399	99.63	.....
Revenue from other railway operations.....	63,124	.34	.02	0.70	.....	10,147	.14	.013	.37	.....
Total operating revenue.....	\$9,002,111	35.19	\$3.100	100.0	.....	\$2,712,436	36.550	3.412	100.00	.....
Way and structures.....	423,853	1.651	\$0.145	4.69	6.08	\$102,130	1.374	\$0.128	3.76	4.06
Equipment.....	548,955	2.140	.189	6.09	7.88	186,947	2.520	.235	6.90	7.44
Depreciation.....	(a) 550,000	2.150	.189	6.11	7.90	378,429	5.099	.476	13.98	15.08
Total maintenance.....	\$1,522,808	5.941	\$0.523	16.89	21.86	\$667,506	8.993	\$0.839	24.64	26.58
Power.....	1,357,225	5.300	.467	15.05	19.52	348,383	4.700	.438	12.86	13.87
Conducting transportation.....	3,471,854	13.550	1.194	38.55	49.98	1,293,309	17.420	1.628	47.65	51.40
Traffic.....	.....	.....	.....	.....	.....	666	.009	.001	.03	.02
General and miscellaneous.....	695,874	2.720	0.240	7.72	10.00	202,554	2.730	.254	7.49	8.06
Add general miscellaneous comparison charge.....	.....	.....	.....	.....	.....	4,912	0.066	.006	0.16	0.19
Total general and miscellaneous.....	\$695,874	2.720	\$0.240	7.72	10.00	\$207,466	2.796	\$0.260	7.65	8.25
Credit transportation for investment.....	94,463	0.368	0.032	1.05	1.36	.....	.....	.....	.....	.....
Total operating expenses.....	6,953,298	27.150	\$2.394	77.29	100.00	\$2,517,330	33.918	3.166	92.83	100.00
Net operating revenue.....	2,048,813	8.040	.706	22.71	29.48	195,106	2.632	.246	7.17	7.76
Taxes.....	513,200	2.005	.176	5.17	7.37	226,535	3.058	.284	8.36	9.02
Net earnings.....	1,535,613	6.035	0.530	17.54	22.11	31,429	0.426	80.038	1.19	1.26
Revenue miles.....	25,610,023	.....	8.84	.....	.....	7,419,272	.....	9.32	.....	.....
Revenue hours.....	2,906,503	.....	.....	.....	.....	795,578	.....	.....	.....	.....

(a) Allowance from profit and loss account for the year. Italics indicate deficit.

The figures shown for way and structures and equipment also include in part some allowance for current depreciation.

may have been misleading to some owing to the difference in practice of the two systems in the way of treating the depreciation account. In the report of the Municipal Railway as given out by the city and as printed in the table, the full amount allowed for depreciation, 14 per cent of the passenger revenue, appears in the operating report. In the report of the United Railroads for the year ended June 30, 1920, \$550,000 was charged to the profit and loss account as a depreciation reserve in

nessy, chief engineer of the city, has submitted the accompanying figures.

The company, he states, has, besides building two car houses, extended the original 45 miles of track called for in the bond issues by 18 miles, so that at present there are 63 miles of operated trackage exclusive of 4 miles in car houses, sidings, etc.

The following figures do not take into account the comparison charges that are required by the city charter. These charges are about \$1,000,000.

renewal account \$222,361. The over-expenditure for the month of the company in its operating allowance was \$30,775, making the total current deficit in the operating account \$254,638.

These two deficits have now reached such a considerable sum that company officials say they will soon have to ask City Council for some sort of an adjustment, particularly in view of the fact that the company's maintenance allowance and its operating allowance were each reduced 1 cent a car mile on April 1 under the terms of the ordinance. The need is great for carrying for these deficits speedily.

During March the company carried 35,900,733 riders, a decrease in traffic of 7.04 per cent over the same month a year ago. The February traffic decrease was about 4 per cent as compared with the previous year.

Although the company officials and Fielder Sanders, street railway commissioner, took steps to curtail service in proportion to the traffic decrease they could not keep pace with the rapidly declining number of car riders, as the number of car miles run in March was 3,157,360, a decrease of only 9.41 over the same month in 1920. Further curtailments of service, however, have been made during April.

The 20 per cent wage reduction accepted by the company's trainmen, effective on May 1, will result in a saving of approximately 1 cent a car mile.

FUNDS VOTED BY THE CITY

Bond Issues:	
Geary Street, 4½ per cent bonds, dated July 1, 1910.....	\$1,900,000.00
Market Street, 4½ per cent bonds, dated July 1, 1910.....	120,000.00
Municipal 5 per cent bonds dated Dec. 1, 1913.....	3,500,000.00
Contribution from General Taxes:	
From city and county of San Francisco during the fiscal years 1910 to 1915 inclusive, to meet interest on funded debt.....	\$239,901.83
Cost of bond election Dec. 30, 1909, and referendum election April 22, 1913.....	29,628.54
Provisional charges for legal and clerical services rendered by city employees.....	37,022.10
	\$5,826,552.47

REVENUE RECEIVED

Total revenue received from the railway for eight years ending Dec. 31, 1920.....	\$15,078,490.49
Operating expenditures for same period.....	9,561,758.63
Net earnings, exclusive of taxes and depreciation.....	\$5,516,731.86

DISTRIBUTION OF NET EARNINGS

Interest on outstanding bonds.....	\$1,642,322.03
Redemption of maturing bonds.....	899,300.00
Extensions and betterments.....	1,188,150.20
Depreciation.....	1,266,832.01
Compensation insurance.....	156,628.69
Materials and supplies.....	150,578.72
Advanced to Twin Peaks Tunnel.....	82,152.52
Accidents, damages, etc.....	130,767.63
Total.....	\$5,516,731.86

Twenty per Cent Revenue Increase with Seven-Cent Fare

The income statement of the Philadelphia (Pa.) Rapid Transit Company for the months of February and March, together with the three months' period ended March 31, is shown in the accompanying table. Since the inception of the 7-cent fare in November, 1920, the Philadelphia Rapid Transit Company has realized a 20 per cent increase in revenue with a corresponding decrease in traffic of only 4.1 per cent. In connection with the record of traffic handled it is disclosed that the number of 3-cent exchange tickets sold decreased about 10 per cent and that joint rate passengers from foreign lines increased about 28 per cent. For the five months' period ended March 31, 1920, with the 5-cent fare in effect 12,644,723 more passengers were carried than in the corresponding period with the 7-cent cash fare and the four for a quarter ticket rate.

**Financial
News Notes**

New Lease Approved.—A lease of the Medway & Dedham Street Railway to the Milford & Uxbridge Street Railway, Milford, Mass., has been authorized by the directors and stockholders, and approved by the Massachusetts Department of Public Utilities.

Assessment Still Under Protest.—The County Board of Equalization at Louisville, Ky., has reduced the tentative assessment of the Louisville Railway's property from its first figure of more than \$14,000,000 to \$9,000,000 flat. The previous assessment was \$4,000,000. The assessment of the Louisville &

Interurban Railway was not changed by the State Tax Commission, but remains at the same figure, \$1,750,000.

Court Orders Interest Payment.—The United States District Court recently ordered Joseph K. Choate, receiver of the Aurora, Elgin & Chicago Railroad, Aurora, Ill., to pay the coupon on the first 5 per cent bonds of that company, which was due on Oct. 15, 1920, together with interest thereon from that date.

Colorado Road Gives Up the Ghost.—The electric railway property of the Durango Railway & Realty Company, Durango, Col., is being dismantled. The company operated 2.5 miles of standard gage electric railway with five motor passenger cars. It is the first electric street railway in Colorado to give up the ghost.

Merger May Be Made Compulsory.—A bill which will permit the electric railways in Washington, D. C., to effect voluntarily the merging of their lines is being drafted in the District of Columbia committee of the House of Representatives. If prompt action does not follow the enactment of such legislation it is expected that another bill will be reported out promptly which would, in effect, compel the local companies to merge.

Capital Increased \$10,000,000.—Papers have been filed with the Secretary of State of West Virginia by the Monongahela Valley Traction Company, Fairmont, certifying to an increase in its capital stock from \$10,000,000 to \$20,000,000. The same company in filing with the New York Stock Exchange an application to list notes a change in name of the company from the Monongahela Valley Traction Company to the Monongahela Valley Traction & Light Company. It is understood that this change was made in order to indicate more accurately the field of operation of the company, which is engaged in railway operation, electric light and power service, mining coal and kindred activities.

Approval Sought for Purchase Financing.—To carry out its plans for the purchase of the Sacramento Northern Railroad the Western Pacific Railroad has applied to the California Railroad Commission for authority to issue \$4,180,000 of its first mortgage 5 per cent gold bonds. The bonds are to be exchanged for bonds of the Sacramento Northern now in the hands of a trustee. The Sacramento Northern bonds deposited for exchange amount to 90.906 per cent of the total issue. The bonds are to be exchanged on the basis of \$80 face value in Western Pacific bonds for \$100 face value of Sacramento Northern bonds. Of the Sacramento Northern stock issue 90.639 per cent, or \$4,065,094, has been deposited with the trustee. The Western Pacific is to pay \$27.50 a share for trust certificates representing first preferred stock, \$15 for trust certificates representing second preferred stock and \$6 for certificates representing common stock.

INCOME STATEMENT PHILADELPHIA RAPID TRANSIT COMPANY

Month Ended	March		Per Cent Change	February		Per Cent Change
	1921	1920		1921	1920	
Operating revenue.....	\$3,757,508	\$3,179,961	18.2	\$3,207,373	\$2,698,457	18.8
Operation and taxes.....	2,765,136	2,234,354	23.8	2,442,504	2,049,795	19.2
Operating income.....	\$992,372	\$945,607	4.9	\$764,869	\$648,662	18.0
Non-operating income.....	46,637	45,109	3.4	36,996	38,900	4.9
Gross income.....	\$1,039,009	\$990,716	4.9	\$801,865	\$687,562	16.7
Fixed charges.....	820,823	816,476	0.5	818,297	813,585	0.6
Net income or deficit.....	\$218,186	\$174,240	25.2	\$16,432	\$126,023	87.0
Three months ended March 31:						
			1921	1920		Per Cent Change
Operating revenue.....			\$10,583,230	\$8,921,677		18.7
Operation and taxes.....			7,878,546	6,499,627		21.2
Operating income.....			\$2,704,684	\$2,422,050		11.7
Non-operating income.....			121,226	123,997		2.2
Gross income.....			\$2,825,908	\$2,546,047		11.0
Fixed charges.....			2,461,362	2,446,666		0.6
Net income.....			\$364,546	\$99,381		266.5
5% return on P. R. T. paid in capital—Three months to March 31, 1921.....		\$375,000				
Amount by which gross revenues were insufficient to provide for operating expenses, taxes, fixed charges, and the 5% return upon P. R. T. Stock for the year ended Dec. 31, 1920.....		\$1,117,934				
			\$1,492,934			
Accumulated deficit for the fifteen-month period to March 31, 1921.....			\$1,128,387			

PASSENGER STATISTICS

March	Passengers		Per Cent Change	Revenue		Per Cent Change
	1921	1920		1921	1920	
7-cent fares.....	4,796,271	.....	.....	\$355,738	.....	.....
61-cent tickets.....	50,658,385	.....	.....	3,166,149	.....	.....
5-cent fares.....	.....	58,858,900	.....	.....	\$2,942,944	.....
3-cent exchange tickets.....	4,454,332	4,881,467	8.8	133,629	146,444	8.8
Joint rate passengers—foreign lines.....	728,297	667,891	9.1	29,908	21,271	40.5
Transfers.....	13,083,915	13,184,661	0.8	.....	.....	.....
Frees.....	397,173	460,982	13.8	.....	.....	.....
	74,118,373	78,053,901	5.0	\$3,665,426	\$3,110,660	17.8
Five months ended March 31:						
7-cent fares.....	27,316,031	.....	.....	\$1,912,122	.....	.....
61-cent tickets.....	241,613,470	.....	.....	15,100,841	.....	.....
5-cent fares.....	.....	281,574,224	.....	.....	\$14,078,711	.....
3-cent exchange tickets.....	20,968,808	23,353,740	10.2	629,064	700,612	10.2
Joint rate passengers—foreign lines.....	3,876,818	3,010,147	28.8	159,310	95,647	66.5
Transfers.....	61,952,081	62,778,117	1.3	.....	.....	.....
Frees.....	2,101,834	2,184,412	3.8	.....	.....	.....
	357,829,042	372,900,640	4.1	\$17,801,338	\$14,874,970	19.7

PASSENGER EARNINGS

	1920	1919	Per Cent Change
Ten months ended October 31.....	\$30,522,922	\$28,564,928	6.8
November.....	3,656,497	3,003,672	21.7
December.....	3,786,442	3,129,467	20.9
Total for twelve months.....	\$37,965,861	\$34,698,057	9.5
1921			
January.....	3,552,152	2,987,814	18.8
February.....	3,140,821	2,643,357	18.8
March.....	3,665,427	3,110,660	17.8
Total for five months ended March 31.....	\$17,801,339	\$13,874,970	19.7

Italics show decrease or deficit

Traffic and Transportation

New Jersey Case Concluded

**Counsel Reserves Right of Appeal—
Company Must Have Compensation Rate**

Valuation of the property of the Public Service Railway, Newark, N. J., at \$125,000,000 or any other figure will not be considered by the Public Utility Commission in reaching a decision on the company's application for a 10-cent fare. The Utility Board made this announcement on April 22 when the rate hearing was resumed, although it was indicated at first that the valuation figures would be injected into the fare case.

That means the case will be decided along the lines laid down by Thomas N. McCarter, president of the railway; namely, a decision as to whether the company can continue operation on its present fare, regardless of the valuation of property. It is a clear-cut case of determining whether the company's operating expenses justify a 10-cent fare.

On the day that this decision was made the municipalities that would be affected by any increase in fare began the presentation of their side. George L. Record, counsel for Jersey City, introduced as a witness Walter Jackson, Mount Vernon, N. Y. Mr. Jackson testified as to his study of various rates of fare in other large cities, the effect of increases in rates upon gross receipts and upon the riding habit as shown by the index figure. He stressed more particularly the fact that while Boston had gone to a 10-cent fare the Boston Elevated, at least, had tried to increase the usefulness of the system to the public by operating 5-cent short haul lines. He also urged that any fare change that was made should contemplate the sale of tickets at reduced rates as a wise merchandising idea and that different self-sustaining rates of fare should be considered for different traffic districts.

The hearing was resumed on April 27 with Mr. Jackson again the witness.

The Public Service Railway called in rebuttal both Edward Dana, general manager of the Boston Elevated Railway under the public trustees, and W. J. Flickinger, assistant to the president of the Connecticut Company. Mr. Dana testified that the company was getting a reasonable return with a 10-cent fare. From 5 cents the rate with that company went respectively to 7 and 8 cents, but each time, he said, the company knew that it would not be enough return and continued its fight for a 10-cent rate.

At the conclusion of the case Edmund W. Wakelee, counsel for the Public Service Railway, said:

The Public Service Railway will ask the commission to fix such rate as it approves as a reasonable fare. The company stipulates that it will follow such a rate fixed by the board, at the same time reserving the right to test the validity of whatever rate may be fixed in the higher courts.

Present Fares Held Adequate

The Pennsylvania Public Service Commission refused to approve an increase in the rates of the Warren (Pa.) Street Railway previously established by the commission where it appeared that the applicant had always been in a financial position to pay an annual 6 per cent dividend. The new rate proposed by the company was a 7-cent cash fare, with ten tickets for 65 cents.

Reduced Fares Abolished

Reduced fares at a half-penny per mile with a minimum of a penny, which were applicable under the Tramway Act for persons defined as artisans, mechanics or daily laborers, have been abolished and uniform rates are now charged on all the city tram cars in Glasgow, Scotland. Under the order granted by the Ministry of Transport these rates will be in effect until Feb. 15, 1923, unless previously revoked by the Minister of Transport. Any further increase in fares made before that date will not affect the rates paid by workmen.

The abolition of the lower rates heretofore conceded to workmen was granted on the understanding that the corporation of Glasgow would not grant sums in relief of rates or otherwise to the common good until reasonable provision had been made for the proper repair, maintenance and renewal of the entire railway property.

Zone Fare Works Well in San Diego

**Change from 5 Cents to a 10-Cent Zone System with 5-Cent Base
Has Produced an Increase of 36.9 per Cent in Revenue**

According to an advance copy of the annual report of the San Diego (Cal.) Electric Railway for 1920, furnished through the courtesy of E. J. Burns, "the zone system as operated in the city of San Diego has demonstrated conclusively that it is entirely reliable, free from objectionable complications and has produced very satisfactory financial results. Operations for the first nine months were reviewed in the ELECTRIC RAILWAY JOURNAL for Nov. 13, 1920.

CONTINUING, the report states significantly that:

The zone system did not disturb real estate values; was not responsible for lowering or raising of rents; and has not changed the population insofar as being directly or indirectly responsible for any congestion in the closely built-up sections of the city, or at the boundary lines of the inner and outer zones. In fact, 90 per cent of the building activities during the year 1920 was confined within the outer zone, and this is also true of contemplated future improvements.

FARE COLLECTION POPULAR AND FASTER THAN BEFORE

It should be understood that the San Diego system is not of the multi-fare collection type, but a true zone system in which but one collection is made for the entire trip. It has been found that the pay-leave plan for outbound traffic and the pay-enter plan for inbound traffic actually has speeded up collection and therefore permitted fewer cars to handle the peak-load traffic than

was the case under the old method of operating pay-enter always, especially on cars with limited loading space. The pay-leave plan outbound is pleasing to the public inasmuch as it is not necessary to shift parcels or packages on boarding cars for the purpose of paying fares. As to pay-enter inbound, the only change due to the zone system was the issuing of identification checks which has worked out with no inconvenience or complications.

MORE REVENUE AND MORE RIDERS

The financial success of the zone system is indicated by the operating figures for the year 1920. The revenue received from the transportation of 20,909,587 cash fare and revenue ticket passengers under the zone system amounted to \$1,330,275 as compared with an amount of \$1,026,445, representing the revenue that would have

TABLE I—CASH FARE AND REVENUE TICKETS, SAN DIEGO ELECTRIC RAILWAY, YEAR ENDED DEC. 31, 1920
(Includes suburban lines)

Passengers Carried	Cash Fare and Revenue Tickets	Rate	Amount
5c. cash fares.....	7,973,635	5c.	\$398,682
10c. cash fares.....	695,375	10c.	69,538
15c. cash fares.....	17,696	15c.	2,654
20c. cash fares.....	9,887	20c.	1,977
25c. cash fares.....	6,019	25c.	1,505
Total cash fares.....	8,702,612		\$ 474,356
Revenue tickets:			
Four-strip, two-zone ticket.....	8,139,734	7.5c.	\$610,480
\$4.00 calendar month book.....	484,127	7.2c.	37,766
Sixteen varieties of school and suburban line tickets.....	3,583,114	1.66c.	\$207,673
		to	
	12,206,975	20c.	\$855,919
Grand total.....	20,909,587		\$1,026,445

been received from the same number of passengers based on the rates of fare that existed prior to Jan. 1, 1920, an increase of 29.6 per cent.

The revenue received per passenger under the zone system averaged 6.36 cents, as compared with an average of 4.91 cents based on rates of fare in effect prior to Jan. 1, 1920, making the average revenue per passenger increase 1.45 cents or 29.53 per cent. Table I, in the company's opinion, indicates that the California Railroad Commission was justified when it stated: "The adoption of the zone system is much more likely to secure to the company the necessary additional revenue than a flat increase," stating for its reason that "a large amount of short-haul business would be lost to the company under a flat increase."

Table II further backs up the foresight of the commission, for therein

passengers per car-mile increased from 5.76 to 5.83 and the revenue and transfer passengers combined from 6.70 to 6.89. The revenue per car-mile rose from 27.18 cents to 37.11 cents or 36.5 per cent.

MORE REVENUE PER CAPITA TO OFFSET PRIVATE AUTOMOBILES

It appears from the report that the banner riding year of San Diego was 1913 when a population of 67,700 was carried 27,156,415 times (including transfer rides) yielding a revenue of \$1,001,314, a riding index of 401.13 rides per inhabitant per annum and an average annual revenue of \$14.79 per inhabitant. During the following years there has been a steady decline in the car-riding index, due permanently to the great increase in private automobiles and temporarily to the jitneys which flourished for two or three years.

under the zone system, has some extra clerical duties.

ZONE FARE RESULTS EXCEED COMMISSION ESTIMATES

The engineers of the California Railroad Commission estimated that the financial results for the twelve months following the adoption of the zone system would provide approximately \$110,000 for fixed charges. As a matter of fact, the amount available for fixed charges was \$219,635 or about 100 per cent more than estimated. However, it should not be expected that the zone system of fares will have any control over expenditures made for maintenance, operation, depreciation, taxes, etc. It is a system of fares affecting revenue only; and, as will appear when the full financial figures come to hand, the company must be relieved of certain burdens, particu-

TABLE II—CLASSIFICATION OF CASH AND REVENUE TICKET PASSENGERS, SAN DIEGO ELECTRIC RAILWAY, YEAR ENDED DEC. 31, 1920

Rate of Fare	Passengers Carried Number	Per Cent	Revenue Collected Amount	Per Cent
13c. to 21c.	763,005	3.65	\$19,909	1.50
31c.	1,691,060	8.09	53,414	4.77
5c.	8,037,525	38.44	401,877	30.21
61c. to 61c.	647,297	3.09	45,972	3.44
71c.	8,140,449	38.93	610,533	45.90
10c.	985,892	4.71	98,591	7.41
121c. to 15c.	518,358	2.48	66,372	4.99
171c. to 25c.	126,001	0.61	23,607	1.78
Total	20,909,587	100.00	\$1,330,275	100.00

TABLE III—SHOWING POPULATION SERVED, REVENUE PASSENGERS CARRIED, REVENUE RECEIVED FROM PASSENGER TRANSPORTATION AND AVERAGE RIDES AND REVENUE PER CAPITA PER ANNUM, SAN DIEGO ELECTRIC RAILWAY

Year	Population Served	Revenue and Transfer Passengers	Passenger Revenue	Average Rides per Capita per Year	Average Revenue per Capita per Year
1913	67,700	27,156,415	\$1,001,314	401.13	\$14.79
1914	75,800	23,595,012	930,089	337.67	12.27
1915	80,600	27,587,239	992,552	342.27	12.31
1916	86,700	24,525,162	932,003	282.87	10.75
1917	90,000	21,973,154	892,166	244.15	9.91
1918	100,000	24,660,128	1,030,745	246.60	10.31
1919	105,000	23,936,680	1,021,362	227.96	9.73
1920	110,000	24,679,568	1,330,275	224.36	12.09

it is shown that the 5-cent fares or short-haul passengers consisted of 38.44 per cent of the total revenue passengers, and that they produced 30.21 per cent of the passenger revenue. Table II also shows that 50.18 per cent of the total passengers were carried on a fare of 1½ cents to 5 cents, an average of 4.62 cents per passenger, and that this class of fare produced 36.48 per cent of the revenue. Fares more than 5 cents consisted of 49.82 per cent of the passengers carried, and yielded 63.52 per cent of the total revenue, an average of 8.11 cents per passenger. The total number of revenue passengers carried in 1920 was 20,909,587 compared with 20,538,530 revenue passengers in 1919—an actual increase of 1.8 per cent despite the combination of higher fares and declining activity. Indeed, it is interesting to point out that the figures for 1919 compared unfavorably with 1918 when the average fare was about the same but when war camps had stimulated the traffic to a total of 21,517,796 revenue riders.

Further, a comparison of 1920 with 1919 shows that transfer passengers increased from 3,398,150 to 3,769,981 or nearly 10 per cent, proving that no privileges in that direction were withdrawn by the zone fare. The increase in revenue was from \$971,174.04 to \$1,330,275.54, an increase of 36.9 per cent. The number of car-miles increased in lesser ratio than the traffic (from 3,572,836 car-miles to 3,583,758 car-miles) as shown by the fact that the cash fare and revenue ticket pas-

The zone system compared with the 5-cent year (1919) immediately preceding has had at least the satisfactory result of preventing any perceptible decline in riding due to increased fares, while raising the average annual revenue per inhabitant to a higher figure, \$12.09, than it had been since the period 1914-1919. This is clearly brought out in Table III.

SALES COMMISSION TO PLATFORM MEN EQUALS 7.17 PER CENT BONUS ON WAGES

A second reference to Table II shows that fare collection on the San Diego zone system is facilitated by the great proportion of convenient cash and ticket fares. Thus of the total, 38.44 per cent were 5 cents cash and 38.93 per cent were 7½-cent ticket, the latter being good for the same two-zone and inter-zone transfer ride as 10 cents cash. The high percentage of these "four for 30 cents" tickets is due to their being sold by the conductors on a basis of 3 per cent commission which is divided among all platform men in proportion to the number of platform hours worked by each man. The sales commissions distributed during 1920 as separate checks amounted to \$22,220 or 3.167 cents per platform hour. This represents a bonus of 7.17 per cent over the regular average wage of 44.128 cents an hour. It may be of interest to add that certain duties, such as turning trolley poles, seats, dash signs and tail lights are now expected of the motorman, as the conductor,

largely paving, before it can show a better return than 3.34 per cent on the investment.

Jitney Regulation Proposed in Birmingham

Regulation of Jitneys operating in Birmingham, Ala., is up before the City Commission and it is probable that some form of ordinance requiring liability insurance will be adopted. City Attorney Fred G. Moore is now working out an ordinance to be presented to the commission for action. Regulations adopted by a number of other cities and suggestions by local citizens and civic organizations are being studied before final drafts of the ordinance are prepared.

At a recent meeting of the commission an ordinance was introduced by Commissioner H. P. Burruss providing for regulation of the jitneys. The ordinance was in form of a suggestion to the commission and Mr. Burruss asked that it be referred to the City Attorney to form the framework for an ordinance to be adopted.

Liability insurance in the sum of \$5,000 in the case of an accident resulting in the injury or death of one person and of \$10,000 in the case of the injury or death of any number of persons was provided in this ordinance. It also provided for the protection of jitney passengers as well as a pedestrian and other vehicles.

Vigorous protests against the adoption of the ordinance or any similar or-

dinance were made by a number of jitney operators. They maintained that the insurance would be prohibitive, though it was provided in the original ordinance that any number of cars operated by a single owner could be protected under a single policy.

The proposal to regulate the jitneys and require insurance has been endorsed by a number of the local civic organizations. It is probable that the final ordinance will provide for insurance protecting pedestrians and other traffic but not jitney passengers.

Ignorance of Hassenpfeffer Kills Ordinance

After more than an hour of debate at the last meeting of the City Council of Toledo, Ohio, an ordinance proposed by Commissioner Wilfred E. Cann barring dogs—except crated or lap dogs—from city street cars was laughed down and defeated.

Regular fares have been charged for dogs but recently a conductor was bitten by an unruly dog and complaint was made against all of the canine family.

Councilman Dominick Foy proposed an amendment which would permit dogs muzzled and leashed to be carried during the hunting season. Another councilman went to bat for dog fanciers and championed the Airedale, of which Toledo family President Harding's "Laddie Boy" is one of the most famous. Another member challenged the statement that the Airedale was a "hunting dog" or a "one-man dog."

When an assistant law director drafted the amendment permitting dogs to ride for full fare during the "hunting season" he made plain that he didn't know what hunting season was meant—hassenpfeffer, squirrel, muskrat or anything else.

The amendment carried, however, and then the whole question was voted down and dogs will continue to enjoy street car rides as regular 6-cent passengers.

Sustains Ten-Cent Fare

Supreme Court Justice MacCrate in Brooklyn on May 2 denied the application of the city for an injunction restraining Lindley M. Garrison, receiver of the Brooklyn Rapid Transit Company, Brooklyn, N. Y., from continuing to charge a double fare on the Broadway, Reid Avenue, Wilson Avenue, Franklin Avenue and Smith Street car line. The court said:

The determination of the Public Service Commission, after hearings, is that these lines are now unprofitable. An injunction may mean their discontinuance. It seems to me better that the public should be transported than that they should be forced to walk.

The 10-cent fare was permitted on these lines on March 12. The city claimed it was illegal. The Brooklyn Rapid Transit contended that one fare could be charged for a ride within the old city limits and another for the continuance of a ride to outlying districts.

Transportation News Notes

Fares Declared Lawful.—The Interstate Commerce Commission held on April 26 that the one-way round-trip and commutation fares between stations on the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., were not unreasonable or otherwise unlawful. The complaint was made by the commuters' club.

Advertising Campaign in Dallas.—The Dallas (Tex.) Railway is conducting a publicity campaign at this time with the object of improving service and eliminating any dissatisfaction among patrons of the company. The campaign is under the direction of Dan Fisher, assistant to President J. F. Strickland. Extensive newspaper advertising is being employed, in addition to personal work among the trainmen and large display posters in the cars.

Higher Fares Asked in Helena.—The Helena Light & Railway Company, Helena, Mont., recently petitioned the Railroad & Public Service Commission for a 10-cent fare in the city of Helena and 15 cents in East Helena. The company also asks permission to sell commutation tickets at the rate of forty for \$2, to be used within city limits. The present rate of 7 cents with 6½ cents where tickets are used went into effect on July 1. The company in its petition declares that this award of the commission was not sufficient to net the railway a reasonable return.

Motormen and Conductors Praised.—W. H. Sawyer, president of the Alton, Granite & St. Louis Traction Company, Alton, Ill., in a letter to the superintendent of transportation and roadway, has complimented the motormen and conductors for their co-operation in the safety work which has been under way for some time. Statistics were prepared and definite figures show that real results are being produced. Comparing the year 1917 with 1920 the total number of accidents has been reduced approximately 23 per cent despite the fact that accidents due purely to automobiles have increased 50 per cent.

Action on Fargo Fare Expected.—The North Dakota Railroad Commission recently arranged to take final action on the question of rates charged by the Northern States Power Company, Fargo, N. D., on its railway. The present 7-cent rate now in force in Fargo, village of North Fargo, N. D., and Moorhead, Minn., became effective last June when the commission ruled that the new rate was temporary pending final determination of the company's property valuation. The justification

for continuing the 7-cent rate will depend upon the railway's income and expense accounts which will be reviewed in detail at the coming hearing.

Interurban Rate Increased.—The Public Service Commission has authorized the Interstate Public Service Company, the Indianapolis & Louisville Traction Company, the Louisville & Southern Indiana Traction Company and the Louisville & Northern Railway & Lighting Company to increase their passenger fare rates basis from 2¼ to 3 cents a mile. These companies all operate a continuous line between Indianapolis and Louisville and their petition said that all other electric traction companies in the State are receiving 3 cents a mile for passenger service and that railroads were receiving 3.6 cents a mile.

Suburban Line Increases Fare.—Under an order issued by the Public Utilities Commission the Northern Ohio Traction & Light Company, Akron, Ohio, began the collection of a 20-cent fare between New Philadelphia and Uhrichsville on March 7. The former rate was 10 cents. The change in fare follows an application filed by the company six weeks ago. The county grant expired at that time and March 7 the city grant at Uhrichsville expired. Negotiations have been going on for some time looking toward a new franchise, but so far no agreement has been reached. Patrons of the line paid the fare without complaint. Recently the company has been conducting an advertising campaign along the line showing the cost of carrying passengers. These figures indicated that a 20-cent fare was necessary. The distance is ten miles.

Suburban Line to Increase Fare.—J. F. Strickland, president of the Texas Electric Railway and also president of the Dallas (Tex.) Railway, announces that fare on the Trinity Heights line, which consists of suburban service through the Trinity Heights addition to the city of Dallas operated over the lines of the Texas Electric Railway, will be increased. The present fare to Trinity Heights is 5 cents, the rate not having been increased when the fares in the city of Dallas were raised to 6 cents. Although the Trinity Heights service is operated over the lines of the Texas Electric Railway the Trinity Heights cars traverse the tracks of the Dallas Railway down town and across the Trinity River bottoms to Oak Cliff, where they leave the rails of the Dallas Railway for the Texas Electric Railway. The contract under which the service to Trinity Heights was established about two years ago has expired and a new contract must be negotiated with the Dallas Railway for the use of its tracks, and Burr Martin, vice-president and general manager of the Texas Electric Company, and Richard Meriwether, vice-president and general manager of the Dallas Railway, are now negotiating for a new contract. The fare increase will be started at the time the new contract goes into effect.

Personal Mention

Noted Engineer President

W. S. Lee, Formerly Vice-President, Has Been Chosen to Head Piedmont & Northern Railway

William S. Lee, Charlotte, N. C., has been elected president of the Piedmont & Northern Railway by the directors of that property. Mr. Lee, for some time vice-president, succeeds the late Z. V. Taylor.

Mr. Lee is vice-president and chief engineer of the Southern Power Company, Charlotte, N. C., a position he has held since 1905 when the company took over other power companies and purchased larger power rights. In this capacity, with the financial assistance

About a year ago Mr. Lee established a consulting engineering office in New York. He already had an engineering staff in Charlotte which now works in conjunction with the New York office.

Mr. Lee was born in Lancaster, S. C., on Jan. 28, 1872, and was graduated from the South Carolina Military Academy in 1894. His early experience was with the Anderson Water, Light & Power Company, Anderson, S. C., where he was engineer in charge of the construction of the Portman Shoals hydro-electric plant. There he placed in service in 1898 the first 11,000-volt generator to be installed in America. His record also includes association with other power companies. Many of these companies have since been taken over by the Southern Power Company.



W. S. LEE

of J. B. Duke as president of the organization, he has designed and constructed eight hydro-electric plants and four steam stations with an aggregate capacity of 280,000 kva.

It is rather interesting to note that Mr. Lee's first practical experience was as resident engineer with a small street railway in South Carolina, which later he left to take up work dealing with power generation. Now one most naturally associates his name with water-power development and electrification of industries in the South, where his leadership and engineering ability have accomplished marvels.

Under Mr. Lee's direction, the Piedmont & Northern Railway has been built up since 1911 so that now it is a system operating 130 miles of track. A high-speed interurban service is furnished, operated at 1,500 volts direct current from the Southern Power Company's system.

The standards devised by Mr. Lee through experience in pioneer design and installation of power transmission equipment have been widely reflected in the practices of other large companies.

R. W. Meade Resigns as President of Detroit Motorbus Company

Richard W. Meade has resigned as president and general manager of the Detroit (Mich.) Motorbus Company. He formerly was president and general manager of the Fifth Avenue Coach Company, New York. Mr. Meade has been responsible for providing in Detroit urgently needed motor transportation facilities by supplying a service similar to that which has proved so useful and popular in New York. The present scope of the system and the results of seven months' operation formed the basis of an article in the issue of the *ELECTRIC RAILWAY JOURNAL* for April 23.

Mr. Meade has made no definite plan for the future as yet, but he expects to remain in the bus business, in which he sees a great future. He will not, for the present at least, resume his connection with the Fifth Avenue Coach Company.

Mr. Meade was formerly a street railway man, at one time having been connected with the Metropolitan Street Railway, New York, now the New York Railways, as assistant to the president. His previous experience also includes long service in steam railroading.

H. M. Addinsell, Chairman of P. S. Securities Committee

H. M. Addinsell, of Harris, Forbes & Company, has been appointed chairman of the Public Service Securities Committee of the Investment Bankers' Association of America. Mr. Addinsell, whose appointment was announced by Roy C. Osgood, president of the association, succeeds O. B. Willcox, who recently resigned from the board of governors. Pierrepont V. Davis, of the National City Company, was appointed chairman of the Railroad Securities Committee.

Steam Road Man Chosen

F. H. Wilson of N. Y. C. Elected President of Cleveland, Southwestern & Columbus Railway

Frank H. Wilson, for thirty-three years connected with the New York Central and Big Four Railroads, was elected on April 26 to fill the position of president and general manager of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio. He will fill the vacancy created at the first of the year by the resignation as president of F. E. Myers of Ashland, Ohio, to become chairman of the directorate.

Mr. Wilson becomes general manager of the Cleveland, Southwestern & Columbus Railway as well as the president because of the continued ill health of E. F. Schneider, general manager. Because of the condition of his health Mr. Schneider was given a three months' leave of absence, which is about to expire. Mr. Schneider says he believes he can resume some sort of work,



F. H. WILSON

while the officers of the company feel that it will be necessary for Mr. Wilson to act as general manager, although Mr. Schneider will be retained in some sort of a capacity.

Mr. Wilson is a steam road man who came up from the ranks. He began his railroad career in Indianapolis as a messenger boy for the Indiana, Bloomington & Western Railway in 1887. He spent the next sixteen years climbing from one position to another in the service of the Big Four.

Ten years ago he went to the New York Central lines as assistant general superintendent of the Lake Shore and Michigan Southern Railway, and four years ago was promoted to the position of general superintendent of the Cleveland district, embracing New York Central territory from Buffalo to Toledo and south. When Mr. Myers resigned Jan. 1 the directors appointed a committee to hunt for a man to take his place and on the recommendation of the committee the election was made.

Otto Miller, of Hayden, Miller & Company, was elected a member of the board and made chairman of its executive committee.

President Devlin Leaves California Commission

President Frank R. Devlin of the California State Railroad Commission on April 26 resigned his position on account of his desire to return to general practice of law, in which he had been previously engaged for eighteen years. Mr. Devlin formerly was district attorney of Solano County, Cal., where he had also served as superior judge. He was a member of the 1911 California State Legislature. Mr. Devlin succeeded E. O. Edgerton as president of the commission when the latter's term expired recently. Chester H. Rowell replaced Mr. Edgerton on the Commission.

H. Stanley Benedict of Los Angeles, an attorney and former member of the State Legislature, and an active member of the State Board of Control with offices in Los Angeles and Sacramento, has been appointed to membership on the State Railroad Commission as a successor to Mr. Devlin. Mr. Benedict has been a resident of Los Angeles for 35 years and has been prominently connected with state projects, offices and politics.

Successful Mediator on California Commission Resigns

After opening and for eight years managing the Los Angeles office of the California State Railroad Commission, Miss Janet Converse on April 26 tendered her resignation to the Railroad Commission in San Francisco. That credit for the highly successful work of the commission in southern California is due Miss Converse was the finding of a committee which recently made a survey of that commission. She is now resigning to engage in business for herself in the field of industrial surveys and public relations.

In the eight years Miss Converse has been in charge of the Railroad Commission's work in southern California, she has adjusted more than four thousand informal complaints without a court hearing before the commissioners. Her policy of inviting parties to a dispute over public service to come to her office and there discuss the subject freely and openly has done much to promote proper understanding between utilities and regulatory bodies and the public. Such conferences have brought executives of the utilities in direct touch with complainants.

Absence of a standard of service for street railways and other public utilities in many communities shows an important work which can benefit both the public and the public utility companies, according to Miss Converse and it is to this subject she will devote her energies. Each man in a city has a different idea of the service the street railway should render and a different complaint to be made to regulatory bodies. This situation presents many difficulties and can be met best by some organization or agency acting independently in a survey of conditions in communities where no standard exists.

Miss Converse was well experienced in organization work when she became secretary of the Southern California Railroad Commission, having had the honor of directing the first woman's political campaign in Los Angeles.

Mr. Mathews Leaves B. R. T. Superintendent of Surface Roadway in Brooklyn Takes Like Position with Third Avenue Railway

E. L. Mathews has resigned as superintendent of surface roadway of the Brooklyn (N. Y.) Rapid Transit Company to take up similar duties in the maintenance organization of the Third Avenue Railway, New York.

Before going to Brooklyn in 1908 Mr. Mathews served some ten years as superintendent of construction for contracting and engineering firms in Baltimore, Md., and was in charge of the rebuilding of a number of street railway lines in that city. Later he was superintendent of construction during the building of the Philadelphia & Western Railway, Norristown, Pa. In 1907 he made an extensive physical examination of the street railways in San Francisco for the firm of Newhall & Company, just prior to the merger of a number of properties there.

In 1908 Mr. Mathews organized the track department of the Coney Island & Brooklyn Railroad, Brooklyn, N. Y., and later became engineer of way and structure for that company, holding this position until the merger with the Brooklyn Rapid Transit System. Entering the way and structure department of the latter company as assistant engineer in charge of maintenance in 1915 he ultimately took over the active field direction of the surface maintenance with the title of superintendent of surface roadway.

State's Directors of Providence Railway Appointed

Governor San Souci of Rhode Island on April 20 sent to the Senate the appointments of Zenas W. Bliss, of Cranston, and George H. Newhall, of Providence, as directors of the United Electric Railways, Providence, R. I.

Mr. Bliss, who is chairman of the State Tax Commission, is now president of the temporary organization of the trolley corporation. Mr. Newhall, state bank commissioner, is the present treasurer of the temporary company.

These appointments are made by the Governor under the act incorporating the United Electric Railways, passed by the legislature two years ago which provides that there shall be two members of the board of directors representing the state.

C. E. Hart has been named chairman of the Findlay (Ohio) Street Railway Commission which took charge of the operation of the cars under a cost-plus form of franchise recently approved for that city. Eight-cent fares are in effect, but the commission

warned citizens to support the lines or an advance to 9 cents would become effective in three months.

J. H. Libbey, who recently resigned as engineer of power and electric lines of the Eastern Massachusetts Street Railway Company, has become connected with H. M. Haven and William W. Crosby, engineers and architects, Boston, Mass.

Obituary

H. S. Graham

Howard S. Graham, president of the Washington-Virginia Railway, Washington, D. C., died on April 10. Mr. Graham was very active in public utility work and was also a banker and broker of great energy and enterprise.

He was probably best known as senior member of the banking and brokerage firm of Graham, Parsons & Company, with offices in both Philadelphia and New York. He had been actively engaged in this line of business for many years and his equitable business policies and integrity of purpose had secured for him a warm and sincere friendship in the various walks of life.

Hardin H. Littell

Hardin H. Littell, seventy-one years old, formerly general manager of the Louisville (Ky.) Railway, died suddenly on April 28 at his home in Buffalo, N. Y., where he had been president and general manager of the Buffalo Railway. He was one of the organizers and the first president of the American Electric Railway Association and was recognized as one of the most capable railway men of America.

Entering the service of the Louisville Railway when 17 years old, Mr. Littell rose rapidly through merit of his ability. He resigned in 1891 to become head of the Buffalo car system.

Born in Corydon, Ind., Mr. Littell attended the country schools of Harrison County until 12 years old. He began his business career as a clerk in a drygoods store, later going with a jewelry store.

In 1864 Mr. Littell became office boy in the office of the late Gen. J. T. Boyle, who first successfully organized a street car system in Louisville. At the age of 22 Mr. Littell was made superintendent. After leaving Louisville Mr. Littell served as president of the Buffalo, Bellevue & Lancaster Railway and president of the Cincinnati (Ohio) Inclined Plane Railway.

He was one of the largest stockholders in the Louisville Railway Company and served as a director until the management was changed a year ago. He retired from business some years ago following the sale of the Buffalo Railway to the International Traction Company.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,

SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

Spring Buying of Rail Bonds for Maintenance

Large Producer Reports Demand Ahead of Last Year; Others Find Less Activity

Although one of the largest rail bond manufacturers reports a demand that on the whole is normal and perhaps even a little heavier than last year, other producers do not find the market especially active this spring. One factor in the buying that is noted by all interests is that electric railways are not stocking rail bonds heavily and are ordering almost entirely for maintenance work rather than on behalf of new track construction.

Whereas most producers, however, state that maintenance buying is down to the lowest possible minimum, the exception heretofore noted reports that, inasmuch as repairs to bonds and other track equipment have been neglected so much in the past, there is a large amount of work that absolutely has to be done this year. Rail bond business so far as coal mines are concerned is far below normal, for with the present slack operating conditions in the soft coal industry buying from that source is light.

Stocks of the finished product are not uniform. Some producers have good stocks on hand and can make immediate shipments, but several others do not follow a policy of stocking as a general rule and hence are quoting deliveries of one to three weeks. Production is curtailed at present, though at least one of the leading manufacturers is proceeding to build up a sizable stock. This action may possibly be influenced by the steadiness of copper prices which have shown some tendency to firm slightly.

Rail bond prices have not changed since the first of last December, when an increase of 5 points in the discount, following several previous recessions from the peak price, brought the quoted discount to its present level of 25 per cent. The opinion is generally expressed that prices have reached bottom in view of the position of the copper market.

Steel Corporation Announces Wage Reduction

The United States Steel Corporation, through Judge E. H. Gary, on May 3 announced a wage reduction of 20 per cent, effective May 16, in the pay of day laborers at the manufacturing plants. Since the reduction in price of steel by the corporation a few weeks ago, the question of a wage reduction has been thought by the trade to be merely

a matter of weeks. Announcement is also made of a reduction in the hours of production per day. In some departments the twelve-hour day has been abandoned and efforts are being put forth to extend this to all departments before the year is out. Other mills have experimented with the 8-hour day innovation with satisfactory results.

Trolley Wire Production at 50 per Cent of Capacity

Though Present Buying Is Only for Maintenance, Producers Are Hopeful of Improved Demand Soon

Conditions in the market for trolley wire are apparently uniform with virtually all producers. The general practice is to cut overhead to a minimum and wait for business to open up. Accordingly operation in most cases is at only 50 per cent of capacity, this curtailment being accomplished by operating but three days a week in some cases and by reducing labor forces in others.

Despite this reduced output stocks of trolley wire with those producers who normally carry a surplus supply, are in ample shape to make immediate shipment on such orders as are coming in. Many producers, especially of plain copper trolley wire, do not usually stock their product, and in these instances orders can be filled in about one week.

Buying is only for repairs and light at that. Producers report that electric railways are not stocking trolley wire to any extent, in fact, because of the delivery situation this is not necessary, and as there are few if any new extensions under way, orders cover only essential maintenance needs and nothing more. There is general optimism expressed by wire manufacturers, however, that an improvement in business in this line is not too far distant. Although the spring is normally the buying season for trolley wire there is a general view that starting with the summer better buying will be felt. The basis for this optimism is largely the good potential market and the possibility of relief from the pressing question of labor readjustments in the industry.

Prices of trolley wire have held steady for quite some time and in view of the low position of copper with its slight tendency to firm in price recently, it seems questionable if quotations can go much, if any, lower. Producers are generally quoting on a 15-cent base though one manufacturer whose product is not all copper is on a 14½ cent base.

Manufacturers Have Low Stocks of Turnstiles

Railways Have Not Entered Market, but Good Demand from Amusement Parks Has Reduced Supply

Prices of turnstiles are still virtually at the peak level of last year, producers report. The chief item in the cost of manufacture is labor, and labor costs in this field, it is stated, are no lower except as greater efficiency of workmen serves to reduce expenses. The price element is not thought to be an important factor in the light buying of turnstiles this spring, however, as there is said to be little likelihood of any decrease in price being made this year.

The main factor in the market is the fact that electric railways have not the money to make new extensions such as building stations and terminals where turnstiles would be used. There is some buying of repair parts of course but as there is never much call for replacements of the finished product the market this spring falls far below that of other years. On the other hand, a good demand has resulted from privately-owned amusement parks and this has either cleared out manufacturers' stocks or reduced them to very low levels.

The general policy now is not to stock turnstiles. Consequently, some producers are turning out this product only on order while others could produce twice as many machines as at present, if it were necessary. Deliveries are not from stock, for the good reserve supply that was built up during the past winter has been exhausted, but at the same time shipments can be made promptly. Inasmuch as turnstiles are largely a seasonable spring product, there does not seem much prospect that the market will open up very much later this year.

Toronto Places \$1,270,000 Order for New Cars

The Toronto Transportation Commission, which will have jurisdiction over the operation of the Toronto Railway system when the franchise expires next September, at a meeting on April 26 awarded a contract to the Canada Car & Foundry Company, Montreal, for 100 motor and 60 trailer cars amounting to about \$1,270,000, exclusive of the electrical and air-brake equipment. It is expected the latter equipment will be purchased either from Canadian or British firms or possibly both. Bids on the car bodies were received from several car manufacturers in the United States, but when exchange rates were taken in-

to consideration the bids submitted were not considered favorably.

The cars will have all-steel bodies. The motor cars will be 51 ft. 8 in. long and 8 ft. 6 in. wide while the trailers will be 49 ft. long and the same width as the motor cars. The seating capacity of the motors will be 57 passengers and the trailers will seat 61. General Manager H. H. Couzens states that a substantial number of the cars will be delivered by the first of next September.

The seats will be of wooden slats; windows of plate-glass and the lower panels in the doors of wired glass. The price for both types is considerably below the original figures received by the Commission. The first estimates were about \$27,000, and it is expected that the cars will be placed in service next fall at a final cost of between \$17,000 and \$18,000 each. Though the contract has been awarded, the Transportation Commission, to comply with the law, must submit the specifications and design for the approval of the Ontario Railway and Municipal Board. This will be done immediately.

Electrification Planned in Jamaica

A \$10,000,000 project for the electrification of the Government Railway is planned by the Jamaican Government, according to the *Times Trade Supplement*, London. Of this amount it is said the pipe and conduit lines will cost about \$2,000,000, on which a 5 per cent saving can be effected by buying from the United States. Seven substations at a cost of \$800,000 are suggested, while trolley wire, feeders, transmission and communication lines will total \$4,000,000. Twenty-one electric locomotives are estimated at \$1,250,000.

Stock Deliveries of Metal Culverts

Railway Buying Small Compared with Highway Demand—Prices Drop 35 to 40 per Cent This Year

Demand for metal culverts with both steam and electric railways does not shape up very large in comparison with the general culvert business, producers report. Some inquiries are received and a few orders are being placed, and though even this spring the railway demand is probably better than has been the case for the past few years, it is by no means up to the old standard of before the war. Culvert manufacturers apparently believe that a large potential market exists in the railway field, however, as some of them are doing considerable circularizing and advertising there.

At the beginning of this year the culvert business looked good in view of prevailing lower prices, better railroad facilities, improved operating conditions and quicker deliveries. Since then there seems to have been a general slowing down of buying, though the demand from highways still causes total sales to hold up to about normal volume if we eliminate from consideration the abnormal demand of last year. Producers are quite generally optimistic that the present year on the whole will yield good results. Extensive road building programs are under way throughout the country, though the work is temporarily set back awaiting a new congressional appropriation for Federal aid in road building.

Little possibility is seen that deliveries will be in anyway pushed for long to come. Stocks of finished culverts are being kept up well so that immediate

shipments can be quoted on standard material at present, while sheet mills are keen for business and compete with each other in giving culvert manufacturers prompt shipments. There is likewise considerable competition among culvert producers for large orders, even for those which yield only a small margin so that plants may be kept running at the present normal rate of operation.

Prices in this market are decreasing in an orderly way commensurate with the drop in material costs. A representative producer who increased prices from 15 to 25 per cent during 1920 has lowered quotations from 35 to 40 per cent thus far this year. In general culvert prices are on a very reasonable basis compared with pre-war prices.

Rolling Stock

The United Railways and Electric Company of Baltimore, Md., on April 25 placed an order with the J. G. Brill Company for ten safety cars.

Municipal Railway of San Francisco, Cal., is making final arrangements to purchase thirty light-weight, single-truck, center-entrance street cars. They will be 29 ft. long, will weight 13 tons, and will be equipped with two 50-hp. motors.

Worcester (Mass.) Consolidated Street Railway Company is equipping twenty of its regular double-truck cars for one-man operation. The cars, which are being refitted in the company's own shops, will not be equipped with standard safety devices. A manual door controlling handle and an original safety device for passengers to release the car doors by pulling a lever if necessary, are being installed.

NEW YORK METAL MARKET PRICES

	Mar. 30, 1921	May 4, 1921
Copper ingots, cents per lb.	12.75	12.62½
Copper wire base, cents per lb.	15.00	14.50
Lead, cents per lb.	4.10	4.75
Nickel, cents per lb.	41.00	41.00
Zinc, cents per lb.	5.15	5.45
Tin, cents per lb.	29.37	31.87½
Aluminum, 98 to 99 per cent, cents per lb.	28.60	28.00

OLD METAL PRICES—NEW YORK

	Mar. 30, 1921	May 4, 1921
Heavy copper, cents per lb.	9.50 to 10.25	10.00 to 10.50
Light copper, cents per lb.	7.00 to 8.50	7.50 to 8.00
Heavy brass, cents per lb.	5.50 to 5.75	5.50 to 5.75
Zinc, old scrap, cents per lb.	2.87 to 3.00	2.87 to 3.00
Yellow brass, cents per lb.	4.00 to 4.25	3.75 to 4.00
Lead, heavy, cents per lb.	3.25 to 3.50	3.75 to 3.90
Steel car axles, Chicago, per net ton.	14.50 to 15.00	14.00 to 14.50
Old car wheels, Chicago, per gross ton.	13.50 to 14.00	13.50 to 14.00
Steel rails (short) Chicago, per gross ton.	12.00 to 12.50	13.00 to 13.50
Steel rails (rerolling), Chicago, gross ton.	12.00 to 12.50	12.50 to 13.00
Machine shop turnings, Chicago, net ton.	5.50 to 6.00	5.00 to 5.50

ELECTRIC RAILWAY MATERIAL PRICES

	Mar. 30, 1921	May 4, 1921
Rubber-covered wire base, New York, cents per lb.	16.50	16.00
Weatherproof wire base, New York, cents per lb.	17.50	15.50
Standard Bessemer Steel Rails, per gross ton.	45.00	45.00
Standard open hearth rails, per gross ton.	47.00	47.00
T-rail, high (Shanghai), per gross ton, f.o.b. mill.	.....	.....
Rails, girder (grooved), per gross ton, f.o.b. mill.	.....	.....
Wire nails, Pittsburgh, cents per lb.	3.00 to 3.25	3.25
Railroad spikes, drive, Pittsburgh base, cents per lb.	3.65	3.40
Tie plates (flat type), cents per lb.	2.75	2.75
Tie plates (brace type), cents per lb.	2.75	2.75
Tie rods, Pittsburgh base, cents per lb.	6.00	6.00
Fish plates, cents per lb.	2.75	2.75
Angle bars, cents per lb.	2.75	2.75
Rail bolts and nuts, Pittsburgh base, cents per lb.	5.00	4.50
Steel bars, Pittsburgh, cents per lb.	2.00 to 2.35	2.10
Sheet iron, black (24 gage), Pittsburgh, cents per lb.	3.70 to 4.20	3.85
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb.	4.55 to 5.25	4.55
Galvanized barbed wire, Pittsburgh, cents per lb.	3.85 to 4.10	4.10

	Mar. 30, 1921	May 4, 1921
Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.70 to 3.95	3.70
Car window glass (single strength), first three brackets, A quality, New York, discount*.	77%	82%
Car window glass (single strength), first three brackets, B quality, New York, discount.	77%	82%
Car window glass (double strength, all sizes, A quality), New York, discount.	79%	83%
Waste, wool, cents per lb.	11 to 17	11 to 17
Waste, cotton (100 lb. bale), cents per lb.	.....	.....
White	9.00 to 13.00	9.00 to 13.00
Colored.	7.00 to 11.00	7.00 to 11.00
Asphalt, hot (150 tons minimum), per ton delivered.	40.00	33.00 to 35.00
Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton.	36.00	33.00 to 36.00
Asphalt, filler, per ton.	36.00	36.00
Cement, New York, per bbl.	3.50	3.20
Linseed oil (raw, 5 bbl. lots), New York, per gal.	.68 to .70	.63
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	.70 to .72	.65
White lead (100 lb. keg), New York, cents per lb.	.13	.13
Turpentine (bbl. lots), New York, per gal.	.54	.67 to .68

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

Recent Incorporations

Texas Interurban Railway, Dallas, Tex.—The Texas Interurban Railway of Dallas, Tex., has been granted a charter by the Secretary of State at Austin. This is the company organized by the Strickland interests for the building of an interurban line from Dallas to Terrell, under the commitments made in the charter granted by the city of Dallas in 1917. The company is capitalized for \$2,500,000, and the purpose as given in the charter is to construct and operate an electric interurban line from Dallas to Terrell, Tyler, Greenville, Paris and Denton. The incorporators are J. F. Strickland, C. E. Calder and C. W. Hobson. Other directors are: R. L. Thornton, Dallas; Walter Allen, Terrell; L. E. Griffith, Terrell; L. J. Rodney, Forney; J. C. Rugles, Mesquite; Schuyler Marshall, Mesquite. J. F. Strickland, president of the company, said that only the Terrell line would be built now, but that the company later may undertake the construction of other lines as provided for in the charter.

Track and Roadway

Lawton Railway & Lighting Company, Lawton, Okla.—Extension of the car lines of Lawton, Okla., to Fort Sill and Medicine Park is proposed by the Lawton Railway & Lighting Company, according to announcement by B. S. Stephens, its president. The proposed extension will pass through the military reservation of Fort Sill and extend about nine miles beyond to Medicine Park, which is fast becoming "the playground of Oklahoma." Plans for financing the extension, which will cost about \$300,000, contemplate the sale of \$60,000 of 7 per cent bonds of the present company to the people of Lawton, and when this is done St. Louis capitalists have promised to carry the project through by advancing the \$240,000 remaining. Construction of the line will begin as soon as the financial details are completed.

Dallas (Tex.) Railway.—The question of forcing the Dallas Railway to comply with commitments made when the charter was granted in 1917, for the building of a double-track concrete viaduct across the Trinity River bottoms for the Oak Cliff lines, is being agitated by the Oak Cliff Commercial Association. The traction company soon after the franchise was granted constructed a portion of the viaduct, that portion over the tracks of the steam railways, thus eliminating a dangerous grade crossing, but building the rest of the viaduct was delayed on account of the cost of material. The traction company has done no further work toward the building of the viaduct, and the Oak Cliff citizens are growing restive and want immediate action.

Wichita Falls (Tex.) Traction Company.—The Wichita Falls Traction

Company expects to build a new car line which will extend from Indiana Street out Sixth or Seventh Street to connect the city with residential sections now without service.

Dallas-Wichita Falls (Texas) Interurban.—Early construction of the Dallas-Wichita Falls Interurban line has been abandoned, due to inability to finance the line at this time. This action is being taken now that the Dallas Railway has already begun construction on the Dallas-Terrell line under commitments made in the 1917 charter. The plan was to have the Dallas Railway build the line to Wichita Falls in lieu of the shorter lines for which it was committed. Under the preliminary financing details, a fund of \$1,000,000 was raised in Dallas and \$500,000 in Wichita Falls. The General Electric Company then agreed to donate an equal amount and \$4,500,000 first mortgage bonds was to be sold. Promoters of the line failed to dispose of the first mortgage bonds. Funds collected in Dallas and Wichita Falls are now being returned to the donors by Wiley Blair of Dallas, chairman of the interurban committee.

Power Houses, Shops and Buildings

Cleveland (Ohio) Railway.—The headquarters of the Cleveland Railway are now located in the new Hanna Building, Euclid Avenue and East Fourteenth Street.

Henryetta, Okla.—R. D. Long, former manager of the Muskogee (Okla.) Electric Traction Company, is attempting to finance a mammoth power plant proposal with a network of interurbans connecting Oklahoma City with Henryetta, Okmulgee and Muskogee. He is supposed to have the assurance of Eastern capital to insure completion of his plans. The proposed power plant is to be located at Henryetta, in the heart of the coal producing section of the state. The proposition is to supply most of the cities and towns of eastern Oklahoma with power from this plant.

Trade Notes

The Franklin Railway Supply Company, Inc., has moved its New York offices from 30 Church Street to 17 East Forty-second Street.

The Connecticut Blower Company, Inc., Hartford, Conn., contemplates the construction of a manufacturing and foundry building, for which plans have been prepared. The cost is estimated at \$62,500.

The Johnson Fan & Blower Company has been organized, with headquarters at 115 South Clinton Street, Chicago. A. J. Johnson, formerly assistant general manager of the Ilg Ventilating Company, Chicago, is at the head of the new concern. The company will manufacture ventilating fans and blowers.

The American Forge & Manufacturing Company, 2433-41 West 48th Street, Chicago, has announced its readiness to supply copper forgings of all sorts, those for motors and motor control apparatus being its specialty. Production was started Oct. 1, 1920, and according to the announcement has reached the point where all orders can be filled.

The Eureka Stone & Marble Company, 179 West Maple Street, Columbus, Ohio, has been incorporated in the State of Ohio at \$350,000 to take over the assets, good will, contracts and all other manner of business of the Eureka Marble & Tile Works Company, at the same address. Standard moisture-proof switchboard will have a special space and the company hopes to double its output in their manufacture.

The Black & Decker Manufacturing Company, Towson Heights, Baltimore, announces that its New York branch office, formerly at 141 Broadway, is now in the Printing Crafts Building, Eighth Avenue and Thirty-third Street, where a service station with stocks is also located. The Detroit branch office has been removed from 19 Selden Avenue to 27 Watson Street. The Atlanta branch office is now at 1508 Candler Building, where Thomas W. Peters, branch manager for the Southern territory, will make his headquarters.

New Advertising Literature

Engineering.—Warren D. Spengler, engineer, Hanna Building, Cleveland, is publishing a series of "Engineering Service Talks."

Foundry Sand Cutter.—The Whiting Corporation, Harvey, Ill., is distributing a four-page folder describing its motor-driven sand-cutting and screening machine for use in foundries.

Signals.—Magnetic Signal Company, Hellmann Building, Los Angeles, Cal., has issued an illustrated bulletin entitled "Safety With Economy," showing the principles and method of application of its magnetic "flagman."

Flexible Cords and Cables.—The Simplex Wire & Cable Company, 201 Devonshire Street, Boston, has developed solid-rubber-covered reinforced two-conductor and three-conductor portable cords and cable for heavy duty.

Track Grinding Machines.—Railway Trackwork Company, Clementine, Thompson and Mercer Streets, Philadelphia, has recently issued a loose-leaf bulletin on railway track equipment, giving detailed illustrated descriptions of reciprocating and rotary rail grinders.

Regulation.—"Progress in Regulation" a brief résumé of the present trend of opinion among the regulating bodies, is being circulated by Harris, Forbes & Company, New York. An account is given of the increases in rates awarded to public utility companies and extracts are published from decisions of commissions in several states.