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PROMOTING UTILITY PUBLICITY

Two very notable contributions on the subject of better public relations are the recent explanation of the Pennsylvania Railroad in regard to its publicity methods, given at the hearings before the United States Commission on Industrial Relations, and the address made recently in Canada by Edward Hungerford on railroad advertising. A digest of both of these statements appears elsewhere in this issue. On the trained newspaper or publicity man their lessons will not be lost, but we are not so sure about their effect on the executive officers of all public utility companies. In altogether too many organizations the publicity man, where there is such an official, is looked upon as a sort of interloper, a kind of unnecessary appendage to the organization. Even where he is a permanent part of it, his work often attracts little interest on the part of his associates and he functions for long stretches without the management being aware of the service which he performs. If his work is important, and it must be or he would not have been appointed, this condition ought not to prevail. Mr. Hungerford says that the publicity or advertising man should insist upon recognition. But the truth is that in too few cases he secures recognition only when some problem of public relations has become acute. Then, when heroic treatment is resorted to and fails, the publicity man is likely to be condemned because his best efforts, applied in a desperate last resort, miscarry. The only logical plan is to keep him so closely in touch with the policies of the company that he can act before the "last resort" treatment becomes necessary.

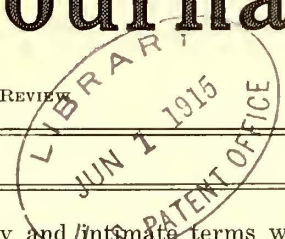
PUBLICITY AND THE JITNEY

There has perhaps been no time when the electric railways in the country stood in greater need of publicity assistance than at present. This has been vividly illustrated during the spread of the recent jitney contagion. Many of the companies were sorely tried, and any number of them floundered around pitifully in their efforts to sense the public pulse. Numerous uncontradicted and misleading statements in the public press regarding the jitneys and the attitude of the electric railways toward them complicated the situation for the companies, and many companies which wanted to explain their position did not know how to do so in a newspaper way and therefore remained silent. Several notable exceptions occur to us, but in very few cases did the railways adequately present their side to the public. Where they did, it was because the companies had trained advertising men in their employ, or the managers, realizing the advantages of publicity,

were already on friendly and intimate terms with the newspapers. The hermit managers reaped as they had sown. Fortunately, this particular situation is passing, but the lesson remains. It is simply that the companies must get accustomed to telling their story to the public in times of peace, to telling it frankly, fully and often and with a view to its being understood and carrying conviction. This is the policy of a few companies and, if judiciously applied by all, will not fail to remove even severe causes of distrust. The mystery of seclusion can only prove a fertile ground for an abundant crop of suspicion.

BAY STATE ARBITRATION ARGUMENT

Considerable space has been given in the columns of this paper to the testimony presented by the Bay State Street Railway in its arbitration case, because of its especially thorough character. This quality is illustrated in the final argument, published in abstract elsewhere in this issue. In this concluding presentation the company might have contented itself with the reiteration of facts brought out in the sixty days of public hearings which signalize these proceedings as among the most exhaustive of which we have knowledge. Instead, its statement of the case reviews every phase of the testimony on both sides which was deemed of interest to the board and subjects the contentions of the men to a systematic analysis. This final review involved such problems as the discussion of the adequacy of wages at the previous arbitration of 1910 and as related to the supplementary agreement of 1912; the money which would have been earned by the men had the compromise offer of President Sullivan been accepted in conference; examination of treatises by expert economists discussing the classification of skilled and unskilled labor; long and painstaking setting forth of the defects in the union evidence; summarizing the features of modern equipment and organization which make the work of the platform man easier than before; contrasting the present and past positions of the union with respect to the relative difficulties of city and country operation; bringing out the inconsistencies of individual testimony by selected employees, and drawing clear distinctions between mere demands on the part of the union and requests based upon concrete and demonstrated conditions. Wherever the evidence of the union failed to demonstrate its object, the brief puts its finger, and in its detailed explanation of the manner in which the company investigated the cost of living throughout its great system, officers of other roads will find the statement of the company an economic classic.



GRAPHICAL RECORDS AND THEIR USE

Readers of the *ELECTRIC RAILWAY JOURNAL* have, no doubt, been impressed by the increasing use in its columns and elsewhere of graphical forms for representing data of one kind and another. Take, for example, the issue for May 15. In the article by F. W. Doolittle two forms were employed, one showing variation of numbers of passengers carried during a week and during a year, the other showing three variables: passengers per car, distance from end of line, and time of day. In the same issue the history of motor ventilation was epitomized in a single chart. In last week's issue operating data of the Chicago & Milwaukee Electric Railroad were presented in chart form, curves of schedule speeds from J. F. Layng's Pennsylvania Street Railway Association paper were reproduced, and Nicholas Stahl showed graphically the results of tapping in feeders at a distance from a substation.

Our observation leads us to conclude that electric railways are using graphical records very effectively, and in no part of the organization more effectively than in the maintenance departments. To convince himself of this the reader need only glance back through the files of this paper for the last few years. What is true in electric railway work is illustrated in other lines; in fact, in every line where future progress is determined intelligently from accumulated data. During the present week there was held in New York a meeting of a joint committee on standards for graphic presentation representing seventeen societies and appointed at the instance of the American Society of Mechanical Engineers. As the name indicates, the purpose of this committee is to promote as much uniformity in graphic presentation as possible, in other words, to influence the development of a "style" in this line analogous to literary style. The very existence of this committee indicates the growing importance of the subject.

We do not advocate the indiscriminate adoption of graphical methods of recording data, but in many cases such presentation may put life and vitality into statistics whose study otherwise would be largely neglected. An examination of present practice leads to the conclusion that where data are filed merely for reference at long intervals they may be more compactly recorded in tabular form. Where the purpose is to arouse interest and co-operation on the part of those who have it in their power to reduce costs or to improve performance the graphical form is, by all odds, preferable. Just as the "eye-gate" is a much readier entrance to the mind than the "ear-gate," so the diagram or picture appeals to the mind more graphically than does a number represented by figures.

In order to comprehend a magnitude symbolized in figures it is necessary for the mind to construct a scale of measurements in terms of familiar objects. The statement that a car is 50 ft. long over corner posts conveys no impression to the mind until a mental picture of some familiar car is constructed, and its length is mentally scaled off for comparison with the length stated. This is a roundabout although familiar process.

The appeal of the diagram to the mind is more effective because more direct, as it greatly simplifies this mental process.

If a foreman wishes to show a workman what he wants done on a certain piece, he demonstrates his wishes on the piece itself if it is available. Otherwise he seizes chalk or pencil and makes a sketch which, however crude, appeals to the workman's imagination. When a master mechanic realizes that the number of cars "pulled in" in a given time is greater than it should be, he is apt to get information together and plot some charts showing the facts on his road compared with those on similar properties. He studies the rate at which cars have been pulled in per month for a number of years and decides that something must be done. Instinctively he calls his foremen together and shows them the charts, enlisting their interest at once. They resolve to improve conditions, the improvement to be shown by future additions to the diagrams.

Three elements in this matter of graphical records appeal to us as important, namely, the selection of material to be graphically recorded, the devising of methods for presenting it, and the use to be made of the diagrams after they are plotted. As outlined above there is no advantage in making records which are not to produce some effect, either in impelling toward improvement or in indicating unusual conditions. In using the graphical records the method adopted on some properties of making them the basis for special or regular conferences is to be commended. The task is to be sure that the diagrams appeal effectively to the individuals most directly concerned.

POWDERED COAL FOR STEAM BOILERS

Considerable publicity was given some weeks ago to a statement that, by the use of powdered coal with its smokeless combustion, the electrification of the Chicago railroad terminals promised to be pushed far into the future if not entirely dismissed from consideration. The basis for this prophecy was the fact that powdered coal is largely used in cement plants and the alleged fact that, until recently, its application to steam locomotives has received little or no attention. If we remember rightly, this matter was under rather extended consideration at least fifteen years ago, and notwithstanding the lapse of time the state of the art in question has changed but little in the meantime. Even commercially the burning of powdered coal is just about where it was at the end of the last century, for it was then, as it is now, full of magnificent promises but hardly anything else.

For steam boilers the combustion of coal that has been reduced to an impalpable dust offers splendid theoretical possibilities. The basic principle involved is simple: When particles of matter are reduced in size, their volumes (and their weights) are technically reduced in proportion to the cube of their diameters. The exposed surface of each particle, however, is reduced only in proportion to the square of the diameter, so that the weight decreases much more rapidly than the area

exposed to the atmosphere. Carried to its logical conclusion the progressive powdering of any material reaches a point where the individual particles appear to float in the air, the ratio of area to weight of each being so great that they follow any air current no matter how slight it may be. A familiar example is found in the "motes that dance in the sunbeam." They are not really lighter than air but they are so small that they are more responsive to movements of the surrounding medium than to the attraction of gravitation. Left for a time in a tightly-closed room they sink to the floor as dust.

Powdered fuel makes use of this principle, and in addition it utilizes the fact that combustion takes place only upon the surface of the burning material. As the ratio of surface area to weight for each particle increases, the rapidity of combustion increases also. In fact, progressive powdering may be carried to the point where the powder, mixed with air, will burn so quickly as to acquire the explosive qualities of gunpowder or vaporized gasoline. Flour for domestic use is, in its barrel, perfectly innocuous, but when ground fine enough and mixed with air it can explode, and has been known to explode, with sufficient violence to wreck a mill building.

Here, then, are qualities which place powdered fuel, in so far as its combustible characteristics go, fairly alongside of the volatile oils, and certainly no better fuels than these can be well imagined. With a sufficient air supply the combustion can be made smokeless. Is it any wonder that the possibilities of the plan, which is by no means new, have always appealed to the engineer? However, the practical difficulties that militate against its success with locomotive boilers are numerous. Several are more or less obvious.

Foremost among these is the establishment and maintenance of a proper mixture of air and coal dust. The locomotive boiler, although it may not look the part, is really a rather delicately balanced piece of apparatus when it is working hard. The amount of air admitted for each pound of coal that is burned on the grates must be kept close to the theoretical requirements even at the expense of the formation of carbon monoxide. Once let only 50 per cent of excess air through the fire (as is good practice in stationary plants) and the smoke-arch temperature becomes prohibitively high. Delicacy of adjustment with a minimum air supply is essential, and this does not seem to have been attained as yet with powdered fuel. At the same time there is the necessity for a hot furnace, and refractory linings in locomotive practice involve objections on the grounds of both installation and repairs. Yet if the lining is omitted there is the probability of burnt sheets due to the direct impingement of the intensely hot dust in process of combustion. On top of it all is the lack of a simple and easily-managed means for producing and handling the impalpable dust before it gets into the firebox.

Although stationary boilers possess little in common with those of the locomotive they are, in a general sense, much more easy to operate so that it would seem that powdered fuel if it comes into use for power pur-

poses at all should find its most accessible field in stationary practice. Smokeless power plants are just as desirable as smokeless locomotives and if the combustion of powdered coal can be commercialized its opportunity is ready-made in stationary practice on these grounds alone. That it has not been able to take advantage of this fact is significant.

Of course, none of these more obvious difficulties appears to be altogether insurmountable. But, on the other hand, all of them have been recognized for a score of years without any great degree of advancement toward their successful disposal, and in the light of that fact it is not very likely that they are going to be overcome *in toto* in the near future. If electrification for terminals was opposed only by the possibility of the use of powdered fuel, its outlook would be rosy indeed.

REAL ECONOMY IN TRACK MAINTENANCE

Too often the track, whether in paved streets or on the private right-of-way, is made the butt of false economy by deferring track maintenance in periods of retrenchment. Unfortunately a road may continue operation, with a certain degree of safety, under such a policy. The standard of track maintenance, however, must be greatly lowered and the cost of restoring the track to its original physical excellence will be greatly increased. Some of the results of deferred maintenance were described by Charles H. Fuller in an article printed in the *ELECTRIC RAILWAY JOURNAL* of April 24, 1915. In this the cost of negligent maintenance of good materials was discussed. The rate of track depreciation, or, in other words, its real cost of maintenance, was shown to grow rapidly with any effort to economize by the neglect of ordinary repairs.

Frequently the financial condition of the company is offered as an excuse for delaying renewals. Real track economy is not dependent upon the financial condition of the company. Where it can be shown that the savings to be gained from a renewal will more than pay interest on the investment in the new materials and labor, unless a company's credit is impaired, only one course appears reasonable. Some properties whose credit is not questioned practice this kind of false economy, either because a scientific analysis of the problem has not been made or because the management fails to realize the difference between a capital investment and an operating economy.

The old adage "A dollar saved is a dollar earned" applies in this case, but one must discriminate between saving the cost of renewals and ultimate economy in operation. "Prudence at the spigot and neglect at the bung" is a trite metaphor to apply to a policy of this kind. When track is repeatedly called upon to stand the major proportion of a retrenchment policy, its service life is shortened with the result that the management is ultimately forced to make complete renewals oftener than traffic demands. On the other hand, the "stitch in time" policy applied to any type of track construction represents genuine track economy and will prolong its life in service.

Low-Floor California-Type Car

The Use of Low-Floor Motors with 24-In. Wheels, Together with Steel Side-Girder Construction, Has Enabled the United Railroads of San Francisco to Reduce the Car Weight to 34,180 Lb.

BY W. B. FARLOW, CHIEF DRAFTSMAN UNITED RAILROADS OF SAN FRANCISCO

The United Railroads of San Francisco have lately completed at their Elkton shops an experimental car that will no doubt be of interest, owing to the ever-increasing demand for low steps and light-weight cars. The general plan is largely identical with that of the cars built for this company in 1913, which were described in the *ELECTRIC RAILWAY JOURNAL* of Aug. 9, 1913. However, the floor has been lowered and the step at the end sill has been omitted, this being made possible by the use of "low-floor" motors and 24-in. diameter wheels.

The management decided some time ago that the "California-type" car was the one best suited for the climate of San Francisco, and consequently has directed all its recent attention and study to the questions of low steps and light weight, notwithstanding the fact that the topography of the city is such that low steps were once thought to be impossible. However, by the careful location of the trucks and the design of the underside of the steps, it has been found possible to place the first step 15½ in. above the street. This distance is further decreased with spring compression and wheel wear to 12½ in. above the street, making the bottom side of steps 11 in. from paving. This has been found to be the absolute minimum clearance.

The principal dimensions of the car are as follows:

Length over bumpers	47 ft.
Length over corner posts	32 ft. 4 in.
Outside length of closed section	15 ft. 6¼ in.
Width over drip rails	9 ft. 2 in.
Height of roof above rails	10 ft. 5¾ in.
Truck centers	21 ft. 3 in.
Truck wheelbase	5 ft. 6 in.
Height of floor above rails	2 ft. 7⅝ in.

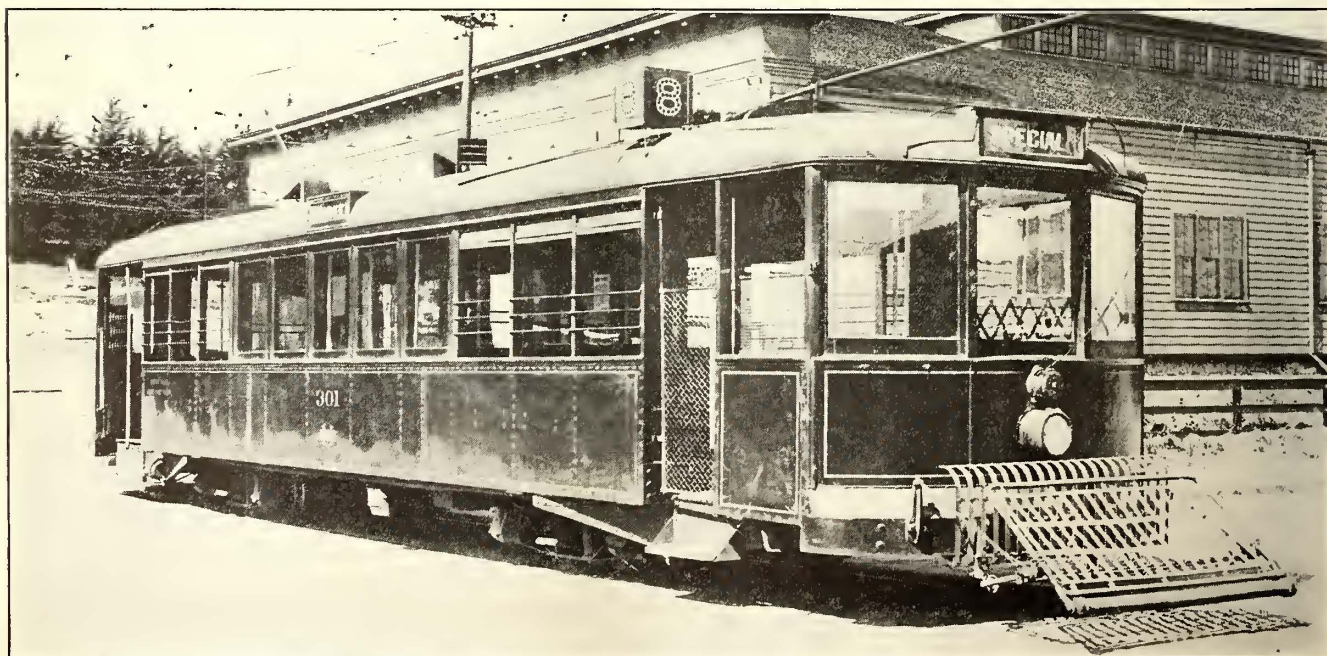
STEEL CONSTRUCTION

For the underframing, steel was generally used, but in a number of instances wood was substituted where

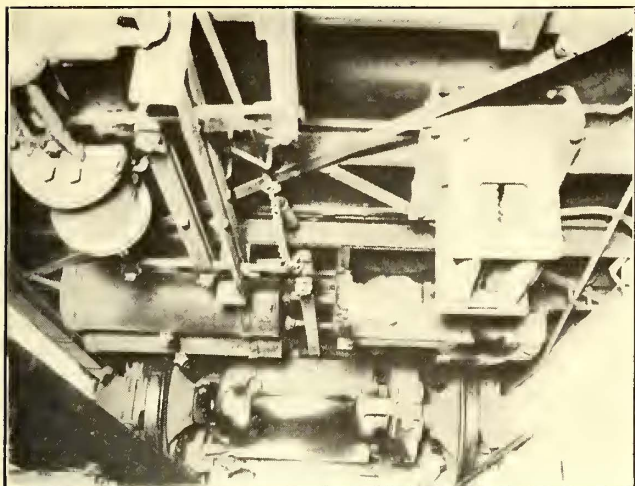
this was found to be lighter and of equal strength. The side sills are of 2½-in. x 2½-in. x ¼-in. angle iron, extending in one piece from end sill to end sill. Crossings of 4-in. 5¼-lb. channel iron were used for the main portion of closed section. The design of the end sills involved a great deal of study, as it was necessary to have the bottom of the end sills flush with the bottom of the side sills to facilitate connections, and at the same time to have the end sill below the floor level at center, on account of the omission of the usual end-sill step. Diagonal bracing of ¼-in. x 2-in. flat steel is used at three points in the underframing. Each brace was fitted with a turnbuckle which greatly assisted in lining up the members.

The platform knees are built up of ¼-in. plate reinforced with 2½-in. x 2½-in. x ¼-in. angle iron at the top and bottom. These knees support the entire platform and they are 12 in. deep, directly below the end sill. The bumpers are composed of an 8-in. 11¼-lb. channel iron reinforced with a 3-in. x 3-in. x ¼-in. angle to take the load of the 2-in. x 5-in. oak center platform knees. To this 3-in. x 3-in. x ¼-in. angle iron is attached a ¾-in. rod which continues back to the end sill, close to and on a direct line with the main platform knees. This method of construction transfers the drawbar pull directly to the bolster and at the same time prevents the platform from being pulled out of line.

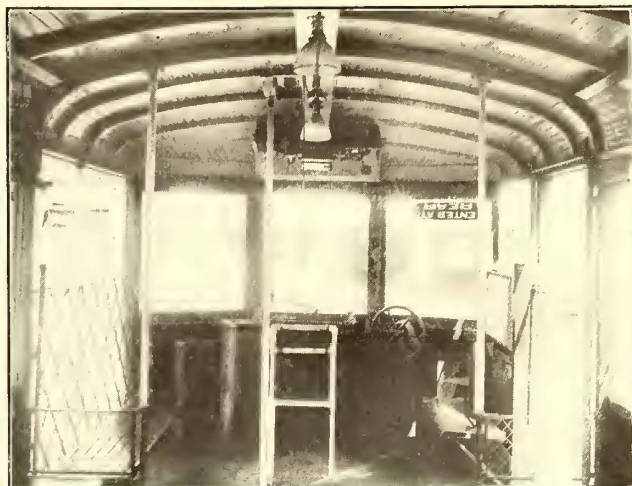
The plate-girder type of design was used because of its strength and light weight. It is not dependent on side posts in any way for strength, which permits the use of light side posts and roof construction. In addition an over-truss rod of ¼-in. x 2½-in. flat steel is used. The designer wishes here to apologize to the various opponents of the over-truss rod, agreeing with them that the side-plate construction does not require the over-truss rod. Nevertheless it will be found of



SAN FRANCISCO CAR—GENERAL VIEW, SHOWING WIDE BODY AND FLAT ARCH ROOF



SAN FRANCISCO CAR—VIEW OF UNDERSIDE, SHOWING SMALL MOTORS AND 24-IN. WHEELS



SAN FRANCISCO CAR—VIEW OF PLATFORM GATES AT FRONT END

great advantage during the replacing of damaged side plates, as it obviates the necessity of blocking up the car body while making plate replacements and prevents the side frame from getting out of line. In this case the over-truss rod is fastened to the side posts and not to the side plates.

The general platform arrangement of the 1913 San Francisco car was adhered to except in the method of folding up the step on the blind side of the car. The step of the 1913 car was operated by changing the position of the conductor's railing. This arrangement was not entirely satisfactory, and on the present car the step is operated by the raising or lowering of the long folding seat. This change makes it impossible for the step to be in the wrong position as it is necessary to raise the folding seat (which operates the step) before the collapsible pantograph gate can be operated.

After careful study it was decided to use side posts of straight-grained ash, 2-in. x 3-in., grooved out for curtains at the open section and rabbetted for the sash in the closed section. The top plate is of long-leaf pine 1¾-in. x 2½-in. in one piece between the corner posts of the vestibules.

Carlines were of steam-bent 1-in. x 1½-in. oak. Considerable trouble was experienced while bending the carlines to the 12-in. radius at the ends, a number of them breaking along the grain. This difficulty was finally overcome by sawing into them at about 1 ft. in from each end. All carlines over the side posts are bound with ¼-in. x 1½-in. steel bent angle-iron fashion at the top plates and bolted through the plate

and cast-brass angle brackets which occur on each side of all side posts.

The roof boards are of 5/16-in. tongued, grooved and beaded cedar, surfaced on the underside to act as the ceiling. No ceiling finish is used except backing for the advertising rack and a portion of the ceiling in the closed section. In this case the finish extends up to the vertical stanchions, and permits a neat finish around the ventilator opening. Wybrolite (alder veneer) ⅛-in. thick was used for the ceiling.

STEPS AND SEATS

The long folding steps as mentioned previously are operated by the platform seats. The short exit steps are stationary. The first step is 15⅛ in. above the street and this is followed by a step of 12⅛ in., making the platform 27¼ in. high. This allows the bumper to be the same height as most other cars operated by the company, which is of great advantage in the event of slight collisions. From the center of the platform to the king pin of the trucks, the floor has a ramp of 4⅜ in. which is so slight that it is not noticeable.

The seats for the open sections are of slat construction, pivoted but not throw-over. Considerable trouble was experienced with the seat backs in the open section of the 1913 car, the dampness causing the slats of the backs to swell and push the top rail out of place, sometimes as much as 1¼ in. This was overcome in a back designed by the company, in which the slats were placed in a vertical position with an open space of ¾ in.

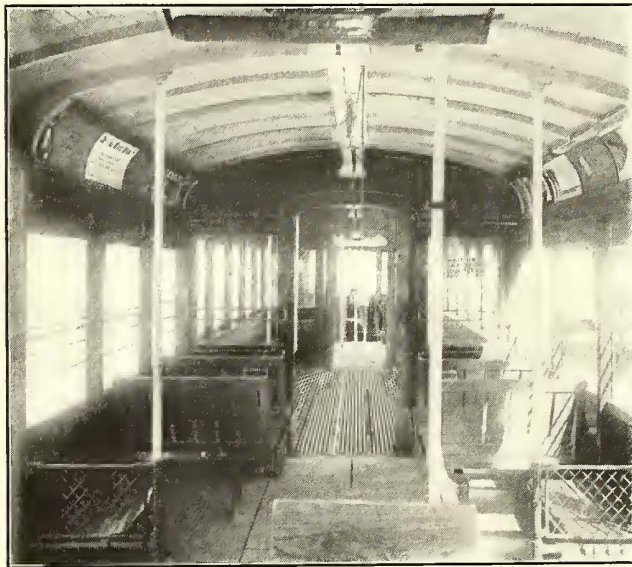


SAN FRANCISCO CAR—SIDE VIEW, SHOWING ARRANGEMENT WITH OPEN SECTIONS AT ENDS OF CAR

between each two slats. The construction permits all members to swell crosswise to the grain without doing any damage, a theory which has proved to be correct during the last few months of rainy weather.

Two different seating arrangements were used in the closed section of the 1913 car, partly in the nature of an experiment, and it has developed that the ideal arrangement for this type of car includes longitudinal seats on both sides with vertical hand rods spaced for two people. Each platform is provided with two folding seats, giving an extra seating capacity for six people. The seats are used on the front platform only.

Special attention is called to the interior view of the open section which shows a very roomy car with the cross-seats fastened directly to the 3/32-in. side plates, the seat cushions being 17 in. x 34 in., and providing a clear aisle of 2 ft. 11 3/4 in. between seat ends. The careful placing of stanchions and grab handles makes this car very easy to walk through while in motion. One rather old patron of the company remarked to the mo-



SAN FRANCISCO CAR—INTERIOR VIEW IN OPEN SECTION

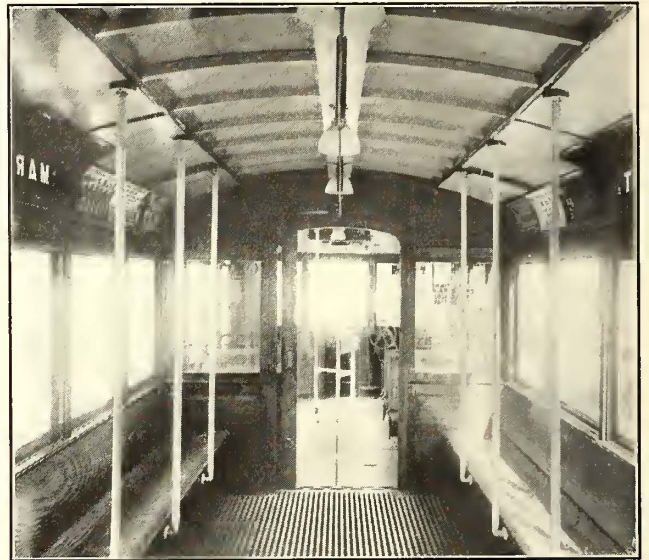
lines directly on the center line of the car, continuing from end to end. At each end of the car directly over the motorman is located a switchboard to which all switches, circuit breakers, fuses, etc., are fastened.

Nine 56-watt Mazda lamps with the Safety Car Heating & Lighting Company's velvet-finish, prismatic reflectors provide the lighting. These lamps are fastened directly to the cable box.

POWER EQUIPMENT

Straight air brakes with emergency valves are used. In addition to the air brakes the car is equipped with a Lord differential staffless hand brake on one end and a Peacock vertical-wheel, geared brake on the opposite end. It was found that the car could be brought to a dead stop from full speed in about two car lengths without the motorman leaving his seat.

The car is equipped with four G.E.-247 railway motors with a rating of 30 hp at 500 volts. The control is designed to eliminate resistance losses, to secure



SAN FRANCISCO CAR—INTERIOR VIEW IN CLOSED SECTION

torman, during her first ride on this car, that it was the first street car through which she had been able to walk while it was in motion.

The seats in the closed section are identical in shape with those of the 1913 car, being constructed of thin slats, 1/2-in. felt backing and finished with canvas-backed rattan.

INTERIOR EQUIPMENT AND FINISH

As the car has two open sections it requires but little ventilation. Although the closed section is but 15 ft. long, four roof funnels are used, two acting as intakes and two as outlets. In addition there are ventilating panels in each end of the closed section over the sash at the opposite side of the door pockets. Ventilators and intakes are high above the street level, and this is a great advantage over intakes in the floor or side of the car close to the floor, as it eliminates the odor of hot, oily air from the trucks of the car and the dust of the street.

All stanchions, grab handles and conductor's railings are enameled white, and one radical change in painting was made by painting the ceiling dead white. The color was chosen because of its bright and clean appearance and its effectiveness for night lighting. White will, no doubt, be the standard ceiling color in the future.

All wires above the floor of the car, except those used for signals, are run in a wood box fastened to the car-

three economical running speeds and to give uniform heating of all four motors, the controllers being of the modified K-36 type. Resistance is used only on the first point and for balancing connections on subsequent steps.

The company made a number of tests to determine the power consumption of this type of equipment in comparison with others, resulting in the following figures:

Equipment	Kw-hr. per Car-Mile
G. E.-80	4.657
G. E.-90	3.974
G. E.-247	2.892

This saving was, of course, largely due to the decreased weight, and during the construction of the new car every detail was carefully watched, and wherever possible every ounce of surplus material was eliminated. The result was that when it was completed and ready for operation, the car weighed, including all such movable fixtures as fare box, motorman's and conductor's seats, sand in boxes, fenders, etc., 34,180 lb., or 683.6 lb. per seated passenger. If more cars are built, we believe they will not weigh more than 33,500 lb., due to slight changes that were found possible after the sample car was completed.

The car was designed by the writer and was built in the company's shops at Elkton by J. M. Yount, master mechanic.

Bay State Arbitration

Résumé of Company's Arguments Not Previously Emphasized in These Columns—Company Asserts Employees Have Living Wage—Wants Award to Men Predicated on Increased Fare

Arguments before the arbitration board in the Bay State Street Railway wages proceedings were concluded at Boston, Mass., on May 22, three days having been devoted to the presentation of briefs. James M. Swift represented the company, and Philip Mansfield and Fred Fay the employees' union. Mr. Mansfield held that the company should petition the Public Service Commission for authority to establish a 6-cent fare unit if it cannot afford to increase wages with its present revenue. The following résumé presents various points of the company's brief not heretofore emphasized.

POSITION OF PARTIES ON ISSUES

1. The union asserts that the wages of motormen and conductors should be 30 cents an hour for the first year and 35 cents an hour thereafter, and that the graduated scale be reduced to a two-year scale. The company asserts that the wages of these men should be reduced to the 1912 scale, and the graduated scale left as at present.

2. The union asserts that the amount of extra compensation for regular men for outside time beyond twelve hours should be 25 per cent for the thirteenth hour and 50 per cent thereafter. The company asserts that it should be no more than 10 and 25 per cent respectively.

3. The union asserts that the amount of extra compensation for extra men for outside time beyond fourteen hours should be 25 per cent for the fifteenth hour and 50 per cent thereafter. The company asserts that it should be no more than 25 per cent for the fifteenth hour and thereafter.

4. The union asserts that seven hours should be the guaranteed minimum day's work for extra men. The company asserts that a minimum of not more than five hours should be guaranteed.

5. The union desires a time allowance for morning extras of two and one-half hours and a time allowance for the crews required for the morning report of two and one-half hours. The company asserts that a period of one and one-half hours is sufficient.

6. Various increases (omitted for lack of space at this time) are demanded by the union for employees in other than the transportation department. The company states that these wages should be as fixed by the 1910 agreement.

WORKING CONDITIONS

Since the agreement of 1910 and the supplementary agreement of 1912, the men have had better hours, more satisfactory working conditions and higher wages, in spite of great industrial depression and distress. The financial condition of the company is such that it cannot afford to pay any increase in wages without encroaching upon its very moderate dividends, to the serious impairment of its credit.

In the 1908 arbitration the union representatives said that the wages were then meeting the increased cost of living. The prior arbitration board must be presumed to have fairly adjusted wages to January, 1909. The company's charts and tabulations in the present case, dated from 1909, show the increased cost of living thereafter as compared with the increase in wages and demonstrate that the fixation of wages in 1912 was not below the living wage.

The men demand an increase varying from 25 to 40 per cent above the present compensation and from 40 to 59.1 per cent above the 1909 basis. Since the 1909 award went into effect the cost of living has increased only 10.5 per cent. The company contends, therefore, that the present demands have no basis in reason. The rates demanded appear to be a standard which the union is seeking to have established throughout the country, without regard to local conditions. No evidence was offered of any company paying such rates.

Relative to the men's contention that they perform skilled labor, it appears from the testimony of A. M. Huddell, the expert witness chosen by the union to represent the trades and crafts, that such a term is not recognized in labor circles. The average period of ten days required for the motorman or conductor to learn to perform his work acceptably bears a ratio of 1 to 109.5 compared with the three-years' apprenticeship period required in many trades. General Superintendent Seibel, widely experienced in contracting and building, described platform work as largely simple, uniform, made up of habitual, mechanical motions, not trying and laborious, and not imposing any special strain on mind or body. Prof. F. W. Taussig, "Principles of Economics," Vol. II, page 134, classifies motormen in a group immediately above day laborers and below the skilled workmen.

GRADUATED SCALE

Of the thirty-one roads operating in Massachusetts not one has a graduated scale with a two-year maximum, and of the thousands of men employed only twelve men are on a flat-rate basis and only forty-six are working under a scale of less than four years. In substance, the plan proposed by the union is a flat-rate system for all but the apprentices or first-year men. Experience, however, has taught street railways that the flat rate, instead of encouraging continuity of service, increases the number of "floaters." The average length of the Massachusetts graduated scale is 6.3 years, and the company contends that the board should not reduce its scale below the six-year limit. No evidence proves that the graduated scale creates discord among the men. The old men do not leave the service because of it, nor do men refrain from applying for re-employment on this account. Between 1911 and 1914, 14.3 per cent of the men who resigned during that period, with full knowledge gained through past experience with the graduated scale, applied for re-employment and were accepted. In 1908 30 per cent of the employees were receiving the maximum pay, while at present 41 per cent are in this class. The average length of service in this period has risen from six to 7.53 years. One of the primary purposes of the graduated scale is to secure a continuity of service. One phase of the scale insufficiently considered by the union is the increased pay resulting from its operation. This year 522 first-year men will receive automatically an increase of 4.15 per cent, 495 second-year men an increase of 4 per cent, 206 fifth-year men an increase of 3.85 per cent, and 95 seventh-year men an increase of 3.7 per cent.

INCREASE OF WORK

The company contends that the work has not increased sufficiently to justify an advance in wages. Cars are

of the same size as in 1909. The equipment may be more complex but it is easier to operate because it is more automatic. Electric switches and automatic signals have appreciably lessened the work. Between 1910 and 1914 the minutes per mile of running time have decreased 0.02 while the allowed time has increased 0.01. Since 1909 the schedule speed has decreased 1.3 per cent. Since 1910 the layover time has increased 0.03 minute per mile operated. Four-motor cars have increased in number, but to meet winter conditions rather than to increase speed. Since 1906 the average car has been 10 per cent lighter in weight, and from 8 to 10 per cent of the cars owned before 1906 have lightened. Between 23 and 30 per cent of the present cars are lighter in weight than in 1906 and none are heavier.

The traffic has increased only four revenue and transfer passengers per car-hour, or 0.5 passenger per car-mile since 1909. There has been an increase of only 0.5 cent in passenger revenue per car-hour since 1913, while the average wage increase demanded is 8 cents per car-hour. Of the 145 various forms of tickets in use, 107 were introduced before 1908 and only twenty-two for the entire sixteen divisions have been introduced since 1912. The identification check and employee's coupon ticket were introduced at the request of the men. It is easier to accept a ticket than to make change incidental to a cash fare, while the ticket obviates the risk of counterfeit, mutilated and foreign coins. Since 1906 there have been no changes in transfer forms or additions to them, except in the Lynn division, when in 1910 fifteen revisions were made. Since 1909 there has been an increase in transfer passengers of only 0.4 per car-hour and 0.05 per car-mile.

There is no evidence that the hours are more irregular than they ever have been; in fact, the nine-hour-in-eleven law would seem to prove the opposite. There is no evidence that comparative operating conditions have changed; that freight, snow, service, or instruction work is any different; that curves have become more numerous, or that blind crossings, intersecting streets, railway crossings or bridges have grown in number; that rail conditions, single track operation, congestion of other city conditions have altered; that there is any new personal requirement; that mail, newspaper or company supplies have increased; that any greater knowledge is called for; that "near accidents" are now more frequent or impose a greater strain; that more announcements have to be made by conductors; that fare, ticket or transfer zones have increased; that the traveling public has become more difficult to handle; that more foreign, counterfeit or mutilated coins are received, or that more forms have been introduced or more reports required.

Such of these conditions and requirements as do exist have existed for many years and have been considered by the men and the company in fixing wages since 1900. The sole issue is whether they are more burdensome, and if so, to what extent. A higher standard of care and a stricter performance of duty are required, more stops are made (one for each 2 car-miles) and possibly more miles per day for some crews are covered, although the last is voluntary. Population, traffic and transfers have increased, the two latter very moderately. When these increases are compared with the easier working conditions, however, their importance becomes slight. Since the last wage award, work has become easier because of shorter hours, decrease in speed, lighter equipment, printed time-tables, reinstallation of the instruction car, white poles, the growing use of tickets and identification checks, electric switches, air brakes, simplified control, abolition of grade crossings, discontinuance of unnecessary stops, electric signals, improved track conditions, heated and inclosed

vestibules, side bars in open cars, sand boxes and sand cars, double registers, the dispatching system, traffic officers, hand-thrown signals, the principle of seniority, operating signs, and rules with more detailed instructions and suggestions. The average wage itself has increased 13.2 per cent since 1909.

COST OF LIVING

Since 1909 the average wage has increased faster than the cost of living, the company thus exceeding its duty. Had it used the government figures for the North Atlantic states instead of making its own exhaustive local investigation on all the divisions of its system, the cost of living resulting would have been lower than actually was the case. The men's testimony as to the increased cost of foodstuffs was very indefinite, and no base price was taken in the letters exhibited from Taunton (Mass.) tradesmen. The personal testimony of the men as to increased rents had no value, in that it did not consider the average house or the average increase.

CHARACTERISTICS OF THE WORK

In regard to the so-called hazards of operation, the company maintains that to the careful conductor the danger of running-board injury is small; that observance of rules relative to side bars protects him from the danger of coming into contact with trees, poles, etc., and that there is not the least operating danger to him from high-tension lines. Only by carelessness can a shock be obtained from an insulated car wheel. Explicit rules cover the situation when cars fail to make their meeting points on time. In the five years ending December, 1914, there were only thirty-six head-on collisions on the entire system of nearly 1000 miles of track. Of twenty-six of the largest industries in the State, only one had a lower percentage of accidents than the company's record for its motormen and conductors in 1913.

The average yearly wage of 2132 regular men is \$793.52; of 856 spare men, \$630.76 and of 3008 blue-uniformed men, \$788.84—higher than the average for the majority of Massachusetts workingmen and much higher when the money value of constant employment and of free transportation is added. The right to take off not exceeding thirty days without losing one's rating is peculiar to electric railway work. If this factor could be measured it would raise the average pay to a substantial amount. The company holds that the average wage of its men permits a very fair standard of living under Massachusetts conditions.

SUPPLY AND DEMAND

The company's evidence shows that this employment has many attractions sufficient to cause members of many other employments to abandon them and seek this. Under existing conditions the company is, and always has been, able to procure needed help without advertisement or solicitation. The wages of city employees do not constitute a determining factor in relation to street railway wages. The former wages are determined by the amount the people who are willing to tax themselves to pay for the public service. Neither is it sufficient for the men to assert that all electric railway employees are underpaid. Electric railways have been in operation for more than twenty-five years, and the necessary presumption is that within such a time the wage of any occupation will have reached a fair average level.

OTHER EMPLOYEES

The union calls for a certain rate per day in twelve specified trades for certain years of service, and also

urges that all employees not so specified be paid the maximum wage in their respective classes and that an increase of 20 per cent be granted. Ranging from a minimum demand of 15 per cent increase for first-year painters to a maximum of 68 per cent increase for armature winders, these demands do not consider relative class or trade value, or efficiency measured in years of service. Their real basis is not one of economic, industrial or working needs, but rather one of force seeking to establish a uniform wage for practically all workmen. Roughly these wages demanded range from a minimum of \$2.50 to a maximum of \$3.50 per day, with double time for Sunday, holiday or overtime work. The company holds that the union has absolutely failed to demonstrate the need of these proposed rates. The union contends that the maximum rate should be accorded at the end of the first year. Apprenticeships in general trades require three years, and in the company's present service, five years. The work of machinists, pitmen, carpenters, blacksmiths, oilers, etc., in the Bay State company does not correspond with that in similarly named trades outside.

Through the introduction of labor-saving tools the work has become less laborious in shops and carhouses. Since 1910 track sanders have received an increase in pay 0.4 per cent greater than the increase in the cost of living, and the men in the equipment department, 5.67 per cent. The power-house and substation employees have had their hours cut from ten to eight, with no corresponding reduction in pay. In the line department, wages were increased 2.6 per cent more than the cost of living. The company contends that the union has introduced no evidence warranting an increase in its offer for extra time compensation to "cover the list," or for increasing the minimum daily guarantee of five hours' work. The hours of labor in different shops should remain as at present in view of the different local conditions.

CONCLUSION

In conclusion, the brief cites various court decisions emphasizing the right of the investor to a reasonable return upon his capital, and points out that in many other arbitration cases the union has recognized the ability or inability of the company to meet demands for increased wages as an important factor in determining an award. It reviews the financial condition of the company, which has not been questioned by the union, and holds that wages should be reduced to the 1912 basis. The management has been able and economical, honest and aboveboard. The company cannot maintain its 5 per cent dividend if wages are increased, or give the public the standard of service required. Counsel submit that if the board decides upon an increase of wages, the finding be made contingent upon the successful appeal of the company to the Public Service Commission for authority to increase fares. The assumption that such an increase would be granted by the commission and that if granted would add materially to the company's revenue, is in the opinion of the management "a nebulous foundation on which to base an increase of wages." The finding of the arbitration board is to be handed down by June 21.

Through an error in the report of the meeting of the Pennsylvania Street Railway Association, published in the last issue, H. R. Stadelman, one of the speakers of that meeting, was mentioned as having been connected with the Nachod Signal Company at Philadelphia. Actually, Mr. Stadelman is connected with the Electric Service Supplies Company, in its street railway signal department.

Jitney Figures from Two Southern Cities

Interesting Data Are Given on the Number of Passengers Carried and the Cost of Operation

Since the appearance of the jitney at Houston, Tex., early last December, the management of the Houston Electric Company has made periodical checks of the operation of every car of that character. In this city the effect of the jitney has been more than usually hurtful, because about 75 per cent of the travel is within a 2-mile zone. In fact, most of the lines are less than 3 miles long, and there are but four lines which are 5 miles to 6 miles long. The jitneys are operating throughout almost all the territory of the company. Their schedule speed averages 14 m.p.h. whereas the cars make but 8.5 m.p.h. on the city sections and 10.5 to 11.9 m.p.h. on the outlying sections.

This superiority in speed is due in part to the fact that the jitney has to stop only for the discharge of four to seven passengers, and in part to reckless driving, as evidenced by numerous arrests and accidents.

One notable feature of the Houston figures is that while the number of cars has decreased, the jitney-hours and jitney-miles have slightly increased. This is indicated by the hours and mileage of Table II rather than by the segregation of Table I. It is also shown by the increase in average revenue per car. As the latter figure is only \$2.46, it is evident that a large proportion of the drivers are rush-hour snipers only. The all-day jitney operators naturally feel very bitterly about these interlopers. It will be seen from Table IV that under conditions of absolute freedom from regulation and ideal short-haul conditions, the gross daily revenue may reach \$9.75. Most of the regular jitney operators, however, earn from \$6 to \$8.

To arrive at the earnings of cars regularly engaged in the jitney service, the cars shown as operating less than two round trips were eliminated from Table II. This excludes practically all the cars operated by individuals who, following their regular pursuits, haul passengers only during rush hours. After these cars are deducted, the data given in Table III are obtained.

TABLE I—CHECK OF HOUSTON JITNEY CARS

	Feb. 2	March 11	April 13
Total cars operated.....	714	656	527
Cars operated less than two round trips	442	373	229
Cars operated more than two round trips			
but less than four hours.....	94	84	112
Cars operated four hours or more but			
less than eight hours.....	105	115	102
Cars operated eight hours or more but			
less than ten hours.....	41	41	47
Cars operated ten hours or more.....	32	43	37

TABLE II—DATA FOR ALL HOUSTON JITNEY CARS

	Feb. 2	March 11	April 13
Trips operated	4,176	4,776	4,630
Hours operated	1,670	1,798	1,840
Miles operated	23,380	25,172	25,760
Speed in miles per hour.....	14	14	14
Passengers carried	18,028	19,725	21,650
Increased 20 per cent for short			
haul*	21,634	23,670	25,980
Revenue at 5 cents each.....	\$1,081.70	\$1,183.50	\$1,299.00
Average daily revenue per car....	\$1.51	\$1.804	\$2.465
Average revenue per trip.....	\$0.259	\$0.249	\$0.285
Average revenue per hour.....	\$0.648	\$0.658	\$0.706
Average revenue per mile.....	\$0.046	\$0.047	\$0.054

*This allowance is made to take care of intermediate passenger pick-ups not recorded by checkers.

TABLE III—JITNEYS OPERATING MORE THAN TWO ROUND TRIPS IN HOUSTON

	Feb. 2	March 11	April 13
Cars operated	272	283	298
Total number of trips.....	3,888	4,221	4,299
Total number of hours.....	1,551	1,595	1,764
Total number of miles.....	21,714	22,350	24,696
Speed in miles per hour.....	14	14	14
Passengers carried (including 20			
per cent increase).....	20,268	22,340	24,976
Revenue	\$1,013.40	\$1,117.00	\$1,258.80
Average daily revenue per car....	\$3.72	\$3.94	\$4.22
Average revenue per trip.....	\$0.26	\$0.264	\$0.292
Average revenue per hour.....	\$0.653	\$0.70	\$0.71
Average revenue per mile.....	\$0.0465	\$0.05	\$0.05
Average length of round trip,			
miles	5.59	5.45	5.74

TABLE IV—SEGREGATION ACCORDING TO GROSS EARNINGS

	March 11	April 13
Number of cars earning less than \$1.....	373	41
Number of cars earning \$1 or more but less than \$2	76	28
Number of cars earning \$2 or more but less than \$3	54	49
Number of cars earning \$3 or more but less than \$4	68	40
Number of cars earning \$4 or more but less than \$5	47	36
Number of cars earning \$5 or more but less than \$6	22	24
Number of cars earning \$6 or more but less than \$7	8	21
Number of cars earning \$7 or more but less than \$8	4	11
Number of cars earning \$8 or more but less than \$9	1	6
Number of cars earning \$9 or more.....	1	1
Total	656	527

TABLE V—RECORD OF CARS IN SERVICE IN HOUSTON

	Total in Service	In Service Previous Month	Entered Service this Month	Out Since Previous Check
February	714
March	656	235	421	479
April	527	279	248	377

Table IV shows the data obtained but with the cars segregated according to the amount of their gross earnings. Table V shows a record of the cars in service.

A series of detailed checks of the earnings of individual jitneys and buses in another large southern city undertaken by the local railway company, shows a situation there not greatly different from that in Houston. The period of the count covered thirty-one days between March 26 and April 25 inclusive, and showed that 401 jitneys carried an average of 18,229 passengers a day and earned an average of only \$911.48, or but \$2.27 gross each. As the jitneys in this city are not restricted to any fixed route they may earn a little more for carrying passengers an extra distance, and also for owl service at double rates. On the whole, however, the average earnings appear to be less than \$2.50 a day. This very low average is due to the fact that many jitney operators are in other lines of business and use their cars for commercial purposes when making trips to and from their homes. Jitney operators who work twelve hours or more a day have gross earnings of \$6 to \$8.

Two routes were checked, those selected being two of the most popular in the city because of their short haul (twenty minutes for the round trip) and heavy travel. The result of the count is given in Table VI.

The earnings of the jitneys for a good Sunday on the two routes mentioned, as determined by the count, is given in Table VII.

The absurdity of a 5-cent, four-passenger or even seven-passenger service speaks for itself from these data. It has been found that even the three twenty-seat buses have not earned more than \$10.80 a day.

Most of the cars in service are either of Ford or mis-

TABLE VI—RESULT OF JITNEY COUNT IN SECOND SOUTHERN CITY

Number of Days	Route	Average Number of Jitneys	Total Jitney Days	Passengers	Revenue
31	A	238	7,380	366,803	\$18,340.15
31	B	163	5,056	198,315	9,915.75
Total		401	12,436	565,118	\$28,255.90
Average per day.....				18,229	911.48

TABLE VII—RECAPITULATION OF JITNEY COUNT FOR SUNDAY, MARCH 28

122 autos earned from \$0.05 to \$1.00 each
36 autos earned from 1.00 to 2.00 each
40 autos earned from 2.00 to 3.00 each
39 autos earned from 3.00 to 4.00 each
27 autos earned from 4.00 to 5.00 each
17 autos earned from 5.00 to 6.00 each
8 autos earned from 6.00 to 7.00 each
4 autos earned from 7.00 to 8.00 each
9 autos earned from 8.00 to 9.00 each
4 autos earned from 9.00 to 10.00 each
5 autos earned 10.00 or more

TABLE VIII—ESTIMATED COST OF JITNEY OPERATION

Ford	Old 7-passenger
0.016	Tires
0.006	Gasoline
0.002	Oil
...	Repairs
0.01	Supplies and garage
0.01	Driver
0.015	Depreciation
...	Accidents
0.004	Licenses
0.063	Total

cellaneous seven-passenger touring-car type. The estimated cost in dollars per bus-mile, as determined by the railway company, is presented in Table VIII.

Power Supply of the Public Service Railway

Factors Are Cited to Account for Increased Consumption of Electricity by Traction Lines

At the May meeting of the Public Service Company Section of the American Electric Railway Association, held recently in Newark, N. J., Dudley Farrand, vice-president and general manager of the Public Service Electric Company, described the development of the power generating system of the electric company since the formation of the corporation in 1903. The railway company operates no power plants but purchases all of the required energy from the electric company, using at present about one-half of the energy generated, i.e., 213,444,675 kw-hr. out of 430,818,532 kw-hr. generated last year. Mr. Farrand "qualified as an expert" to speak on this subject by stating that he began his electric railway work when Leo Daft was experimenting in Newark in 1889. He has been connected with it ever since. When the Public Service Corporation was formed there were fourteen power stations on the property, having a combined capacity of about 40,000 kw. This number had increased to twenty-six in 1914 with a combined capacity of about 171,000 kw. In the same period the number of substations increased from nine to fifty-eight, as the supply gradually changed from direct to alternating current. At first the railway load predominated, but the lighting load has grown faster until now the two are neck and neck.

In order to determine roughly the electrical energy consumption per passenger carried by the railway, Mr. Farrand divided the total kilowatt-hours supplied to the railway by the total number of passengers carried ten years ago and to-day. The result was to show an increase from about 0.48 kw-hr. to 0.529 kw-hr. per passenger during this period. The corresponding increase in kilowatt-hours per car-mile has been from 3.21 to 3.76, or 17 per cent. The schedule speed has increased more than 10 per cent at the same time. In the meantime the electric company has, by the introduction of modern generating and transforming apparatus, been able to make a very considerable reduction in the cost of generating energy partly, at least, offsetting the increased energy consumption per passenger carried.

In explaining the increased power consumption by the railway, Mr. Farrand found the following contributing causes: Increase in number of stops per mile; use of larger and heavier cars; adoption of four-motor equipment; more rapid acceleration of cars; increase in schedule speed; more brilliant lighting of cars; great increase in the number of electric heaters used; adoption of grooved rails in city streets with consequent friction losses; addition of electric signaling apparatus; substitution of electric for horse-and-cart hauling for construction and repair departments; demand for power for electrical welding of joints, and more liberal use of light in carhouses and offices. To offset the necessary increased demand motormen and others can do a great deal to save electrical energy. They can avoid "kangaroo" starts and "grandstand" stops; they can coast more; those responsible for car cleaning can turn out lights when not in use, etc.

In tracing the development of the company's power stations Mr. Farrand pointed out how the cost of electrical apparatus per kilowatt of capacity has been brought down in recent years. Averaging the cost over a period of years he found that the investment

cost per kilowatt, exclusive of distribution, was \$208.33, made up as follows: real estate, \$25; buildings, \$60; equipment in generating and substations (excepting items following), \$40; engines and generators, \$58.33; switchboards, wiring and transformers, \$35; miscellaneous, \$15. It should be possible to figure for the future a total of about \$120 for bare cost of physical equipment, as follows: Generating stations, \$50; transformers, aerial, \$10, subway, \$20; substations (\$25 to \$45), average, \$30; miscellaneous, \$10. Allowing for reserve, the total may be increased to \$150. The latest power station of the company, known as the Essex station, when completed will have a capacity of about 150,000 kw and will have cost about \$50 per kilowatt exclusive of real estate.

As an example of obsolescence Mr. Farrand stated that the contents of twelve power stations recently scrapped, which had originally cost \$646,030, sold for \$12,750. In order to give his audience an appreciation of the power consumption of an electric heater, Mr. Farrand showed that the heaters for one car use power requiring an investment of \$1,250 in generating and distributing machinery.

Arkansas Managers Meet

Jitney Discussed in President's Address—Officers Elected for the Ensuing Year

At a meeting at Little Rock on May 11-13 of the Arkansas Association of Public Utility Operators the principal subjects of electric railway interest discussed were problems of financing small utility companies, franchise terms and the jitney.

The latter subject was considered particularly by President C. J. Griffin in his annual address. He pointed out that during the past year street railway companies have not only been subject to the falling off in revenue owing to the general business depression, but in addition to this they have the competition of the jitney bus. He stated that this was unfair competition, as the jitneys pay no tax whatever, and the street railway companies are compelled under their franchises to pave from one-third to two-thirds of the width of a street, which makes it possible for the jitney bus to thrive. He also stated that the jitney simply takes the short-haul passenger and leaves the long-haul passenger for the street railways.

The financing of small utility companies was considered in a paper presented by H. C. Couch, president of the Arkansas Power Company, Malvern, Ark. Mr. Couch cautioned promoters endeavoring to finance a property against painting it in tints too rosy, thereby making the financier expect too much from his investment. He also emphasized the value of long-term franchises, declaring that it is hard to finance a utility the franchise of which has less than twenty-five years to run. He insisted that it should not be difficult to convince a city council that a long-term franchise is not detrimental to the community's interest, while it is distinctly beneficial in financing the property, and that a city can properly grant a fifty-year franchise, while making contracts for street lighting and fire-hydrant service for shorter periods. Turning to the operation of the small central station, Mr. Couch urged that everyone connected with the company study most seriously the needs of the company's patrons. Each employee, he declared, should always be ready to listen to a complaint and, so far as he is able to do so, to remove the cause therefor.

Mr. Couch's paper was discussed by C. J. Griffith of Little Rock, Byron C. Fowles of Pine Bluff, Minor Q.

Woodward of Pine Bluff, E. T. Reynolds of Camden, and C. M. Richards of Hope.

Other topics considered at the meeting were methods of reading electric light meters, collecting accounts and power transmission.

The following officers were elected for the ensuing year: president, H. C. Couch, Little Rock; vice-presidents, W. L. Woods, Texarkana, and W. J. O'Brien, Helena, and secretary-treasurer, Roy B. Fowles, Pine Bluff. The newly-elected president appointed the following members of the executive committee: Andrew Patterson, Texarkana; Mrs. Anna B. Stoops, Stuttgart; J. F. Christy, Jonesboro; Byron C. Fowles, Pine Bluff, and C. J. Griffith, Little Rock.

Railway Signal Association Meeting

Reports of Several Committees, Including Statement on Methods of Testing Signal Circuits and Signal Apparatus

At the stated meeting of the Railway Signal Association, held at the Hotel Astor in New York City on May 26 and 27, reports were presented by five standing committees and two special committees. Among the former was the report on power interlocking which included revised specifications for electropneumatic interlocking, with ten drawings, and revised specifications for fiber conduit and specifications for incandescent electric lamps. The committee on manual block presented a statement on the care of dry batteries, together with instructions for the maintenance of dry cells, gravity cells and caustic soda cells. The committee on standard designs presented eight new drawings, including a revision for the standard design of semaphore blade for upper-quadrant signals.

The committee on electric railway and alternating current signaling presented specifications for reactors for line and track circuits and reported that it was bringing up to date the sections of new and extended alternating current signal installations. Progress was reported in the committee's investigation of the inductive effects between signal circuits and adjacent electric circuits, as well as the hazard due to paralleling high-tension and low-tension lines. The committee on storage-battery and charging equipment presented specifications for nickel, iron alkaline storage batteries and included a statement on the cost of electric energy for charging batteries. The special committee on lightning protection made a report which included specifications for vacuum-gap lightning arresters, air-gap lightning arresters and choke coils for use with lightning arresters.

TESTING SIGNAL CIRCUITS

There was also a report from a special committee on electrical testing in which was presented a progress report on methods of testing electric signal apparatus and circuits. This stated that, with the exception of forms of recording the result, of track circuit and relay tests, very little had been done toward standardizing methods of conducting tests. Very few such forms are in use, and they are greatly different. In general the frequency and methods of testing are left to the discretion of the men having this class of work in charge. The number of inspectors, frequency of tests, and the nature and thoroughness of such tests varies with the size of the signal organization, density and importance of traffic and the extent of electrical signal apparatus.

On one of the largest railroads the practice is to test each circuit on the entire system for correct operation and insulation at least once each year. This is done by

several men specially trained for the purpose. It does not include the testing of track and other simple circuits, which are a part of the every day routine of maintainers. However, the work of the latter is checked by the special men on their periodical visits.

In these annual tests controllers and relays are opened and closed, and the results of observation as to the action of the pending apparatus are recorded and checked with the circuit layouts as to correctness. This plan is simple, practical and takes a minimum of time and can readily be done without delay to traffic.

All underground and overhead wires are tested for insulation to ground, generally by the use of a megger or similar instrument which is more easily applied and gives a reading in less time than with other types of apparatus. The minimum resistance allowable depends upon the potential requirements surrounding conditions of the conductor, but in general any conductor with a resistance of less than one megohm is closely watched, those with one-half megohm resistance are usually renewed and those with one-quarter megohm are always renewed.

Generally, a fault is located and corrected before an interruption occurs. When testing cables, insulation readings are taken between the wires as well as to the ground, especially in the case of old cables or if the conditions are extremely unfavorable to the life or efficiency of the insulation. As testing between conductors at points where traffic is dense results in considerable delay, it is avoided if possible, a temporary cable being provided for use for making tests. Interior wiring is not usually tested except by observation and proper operation of apparatus. Emergency tests for location of faults affecting apparatus are usually made by foremen and maintainers, the special men being called upon only in case of any interruption.

TESTING SIGNAL APPARATUS

On small installations the apparatus is tested at the same time and by the same force that tests the circuits. On larger installations a different force is employed. Special attention is given to relays, which are exchanged and sent to central points for cleaning and repairs. Smaller divisions receive this attention in the field. They are cleaned, adjusted, and have pick-up and drop-away readings, these being noted on a paper form pasted on the bottom of the relay, together with the name of the tester and the date. Tower apparatus is tested and inspected by experts once each year in addition to very frequent inspections by maintenance forces. Signal motors and electric interlocking apparatus are frequently inspected but seldom tested (except for crossing protection) unless some form of trouble develops, when a thorough test is made and the fault corrected in the most practical manner.

Amusement Parks Open in Kansas City

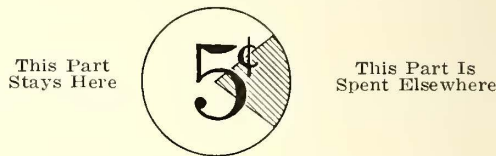
The amusement park season in Kansas City, Mo., opened on May 23 with the opening of Electric Park, the chief amusement center. This park is in the residence district, a block from the grounds of the Federal baseball league, and on the main route to Swope Park, the 1300-acre public playground. Electric Park and the ball grounds are on the south side of Kansas City; the American Association baseball grounds are also in the south part. This year Fairmount Park is under new management which will improve the attractions and probably will induce much larger traffic in that direction. Fairmount is convenient as an amusement park to Independence, Mo., and the growing suburban district between that city and Kansas City, all being served by the Metropolitan Street Railway.

Railway and Jitney Nickels

Their Distribution in Portland and Elsewhere as Illustrated in "Watts Watt"

Watts Watt, the publication of the Portland Railway, Light & Power Company, of Portland, Ore., in its issue of May 15, contained a diagram and table of the distribution of the nickel in electric railway and in jitney service. The material was published on opposite pages so as to be more effective. A reproduction follows:

THE STREET CAR NICKEL
(Chart below is based on 1914 operation)



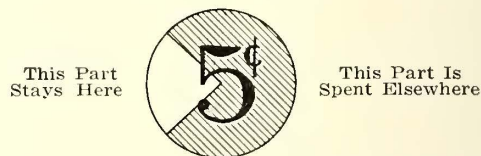
The Part That Stays Here
I.—The street car company does not get a whole nickel. 28 per cent of it, or 1.4 cents, goes back to the public as a rebate in the form of commutation tickets, free tickets to city employees, such as policemen and firemen, and for transfers, so for each passenger carried the company only gets 3.6 cents. On the other hand, the jitney gets the whole nickel with no reductions of any kind.
II.—Wages alone are 41 per cent of this 3.6 cents, or more than the entire portion of the jitney nickel left in Portland.
III.—Taxes, bridge rentals and paving expenses consume a big part of the street car fare.
IV.—Then there is the outlay for damages, supervision and other local expenses, all of which stays here; also
V.—The portion of power cost representing wages, wood fuel and local supplies, and
VI.—Depreciation, that part of which includes local supplies and local labor.

The Part Spent Elsewhere
I.—Interest on street car investment. Nothing could please the Old Reliable Service Company more than to find Oregon money seeking investment in this company. Invitation to Oregon money has been and is constantly open to such purposes. Oregon money as a rule seeks more profitable investment than that permitted to the public utilities. And, so, the Eastern investor who is content with more modest interest return, comes to Portland's aid and that of the surrounding community by furnishing nearly all the funds required by the Old Reliable Service Company and other similar public utilities.
II.—Material manufactured elsewhere takes a small portion of the nickel.
III.—Remaining items entering into power cost.
IV.—Depreciation, that part which includes those things which cannot be purchased or made here.

3/4 OF THIS NICKEL IS REINVESTED IN PORTLAND

THE JITNEY NICKEL

(Chart below is based on best available data from several sources here and elsewhere)



The Part That Stays Here
I.—Garage expenses and such repairs as can be made locally.
II.—Interest (if venture is not financed by automobile company or other outside interests).
III.—License fees.
IV.—Damages (in case victims succeed in recovering anything).
V.—Wages, when anything is left after other necessary expenses are paid. The fact that there are 35 per cent fewer jitneys in operation now than sixty days ago is evidence that the wages earned by the jitney operators are not sufficient to make the business attractive in by far the majority of cases. The City Hall Records prove this. Very few of the original jitney drivers are in business today. The fact that new ones have taken their place simply proves P. T. Barnum's famous statement.

The Part Spent Elsewhere
I.—Little Johnnie Rockefeller gets a big slice of the nickel for gasoline and oil.
II.—The Rubber Barons come in for another fat part of the coin (there are no tire factories in this locality).
III.—Repair parts bought from the Eastern auto manufacturers absorb a little more.
IV.—Depreciation. This is one of the rocks on which the big bulk of the jitney wildcatters have gone broke. Usually, old second-hand machines are purchased on the installment plan and are operated until they are in the last stages of "consumption," and then they are "scrapped" and sent to the "Old Ford's Home" and the jitney man must buy another or go out of business.

ONLY 1/4 OF THIS NICKEL STAYS IN PORTLAND

The tables reproduced were also accompanied by other comments to emphasize the lesson conveyed.

Annual Convention of Southwestern Electrical & Gas Association

Economies in Track Construction, Repair-Shop Practice, Welfare and Safety Were the Principal Topics of Discussion at the Meeting Held in Galveston, Tex., on May 19 to 22

Operating problems, welfare and the jitney bus competition and proposed regulation were the principal topics of discussion at the annual meeting of the Southwestern Electrical & Gas Association held at Galveston, Tex., on May 19-22. More than 200 members registered on the opening day, and the total registration for the week was approximately 400. At the opening session on Wednesday morning President D. G. Fisher, assistant general manager Southern Traction Company, Dallas, Tex., presided, and Mart H. Royston city attorney of Galveston, welcomed the association to the city. John A. Bonner of Houston responded to the address of welcome on behalf of the association. Following the reading and acceptance of the minutes of the previous convention of this association, Secretary H. S. Cooper reported an increase in membership despite the unfavorable business conditions and the loss of some members of the association through the consolidation of some of the properties. Secretary Cooper stated that the present membership was 232, and in closing his report emphasized the importance of increasing the scope of the association's work, especially urging more attention to matters of public interest. President Fisher then addressed the convention, his remarks being summarized elsewhere in this issue.

At the railway session of the association, held on Wednesday afternoon, B. R. Brown, superintendent maintenance of way Dallas Consolidated Electric Street Railway Company, read a paper on "Track Construction in Paved Streets." V. W. Berry, master mechanic Northern Texas Traction, Fort Worth, Tex., opened the discussion by inquiring of the author his reasons for recommending girder rail as a substitute for high T-rail in paved streets. Mr. Brown responded that his experience with T-rail carrying interurban cars on paved streets had been that the heavy cars caused the rail to receive a wave motion which loosened the paving alongside. In addition Mr. Brown objected to T-rail because it was practically impossible to keep the wheel flanges from crowding dirt down in the flangeway, which ultimately resulted in the pavement buckling.

W. A. Sullivan of Shreveport spoke in favor of the Atlas joint as against the continuous joint. Richard Meriwether, general superintendent Dallas Street Railway, Dallas, Tex., stated that his company used the continuous joints exclusively and found them satisfactory. Others taking part in the discussion of this paper were R. T. Sullivan of Houston and Secretary Cooper.

"Economies in Repair-Shop Work and Maintenance" was the title of a paper presented by V. W. Berry, master mechanic Northern Texas Traction Company, Fort Worth, Tex. The discussion of this paper opened with a question as to how far inspection on a car-mileage basis could be applied to the various parts of car equipment. In response Mr. Berry stated that his company was inspecting everything on a car-mileage basis. While there might be some difficulty in arriving at the correct period, it was merely a question of working out a system. Secretary Cooper asked if it was not a fact that the predetermined time or mileage of the weakest part of a car, and not of the car as a unit, formed the basis of arriving at the correct inspection period. Mr.

Cooper also brought out the point that where the predetermined period for inspection of the different parts came at approximately the same time, both or all of such parts should be inspected and repaired at one time.

Car painting as practised by the various member companies was also discussed informally, and it was brought out that the interval at which cars were given a thorough repainting varied from three to eight years on different properties. Secretary Cooper cited Galveston as an example of the advisability of thorough painting whenever painting was done. He stated that the Galveston climate deteriorated paint very rapidly, consequently the best quality of paint and varnish combined with first-class workmanship was none too good for cars on that railway. Richard Meriwether of Dallas and D. A. Hegarty of Houston also took part in this discussion.

G. W. Smith, electrical engineer San Antonio Traction Company, San Antonio, Tex., then read his paper on "Track Construction and Welding Rail Joints." The principal point brought out in the discussion which followed was that of the method of laying brick along the rails. Although this topic did not bear directly on the subject, it was of interest because the city engineer of Houston had attempted to force the Houston Electric Company to lay brick paving in stretcher courses along the rail. W. M. Archibald, engineer maintenance of way, objected to stretcher courses at this point because the longitudinal joints were in line with the direction of traffic. Mr. Smith responded that if it were possible to lay the bricks or blocks longitudinally with the rail a great deal of cutting would be saved. Continuing, however, he said that he objected to this practice because he feared that inasmuch as the longitudinal joint lies in the same direction as the traffic, the life of the pavement would be shortened materially.

D. A. Hegarty of Houston advised that where the ties were laid in concrete, corrugation followed and was due to extremely rigid construction. In another type of construction where the ties were laid in concrete pockets on a ballast cushion, corrugation had not appeared, due to the increased flexibility given to the rail. He said that this kind of construction also prolonged the life of the pavement in the track allowance. Others taking part in this discussion were W. A. Sullivan of Shreveport and Secretary Cooper.

In the absence of C. O. Birney, superintendent of car construction Stone & Webster Engineering Corporation, the time assigned for his paper on "A New Type of Street Car for City Operation" was devoted to a discussion of jitney competition and regulation. It was opened with a paper by R. T. Sullivan, general superintendent Houston Electric Company, entitled "A Study of the Jitney." This paper was written for the Stone & Webster *Public Service Journal* by Henry G. Bradley and published in the April issue of this year. The general interest in this subject precipitated a lively discussion, which was opened by President Fisher with the remark that almost every city in the Southwest was afflicted with "jitneyitis." David Daly, manager Galveston & Houston Electric Railway, remarked that reg-

ulation had come first in the smaller cities probably because of the political influence of the people engaged in jitney business. While the railway companies were suffering considerable losses due to this class of competition he was of the opinion that it was a matter for the public to decide because in the end the public must pay the bill.

W. A. Sullivan of Shreveport stated that a local stock company had been organized in Shreveport in January, 1915, with about seventy jitney buses in operation, but that the number has been reduced to fifteen or eighteen. He stated that the City Council, at the instance of the public, had taken action which he thought would curb the development of the jitney bus in the city. C. A. Newning, editor of the *Southwestern Electrician*, voiced the opinion that the jitney business was on the wane. Charles W. Rogers of the Doherty Operating Company, New York, said that a light car weighing approximately 11,000 lb. would do more to kill the jitney bus competition than any other one thing. To this remark Secretary Cooper added that the jitney had led the public to expect a more frequent service and that in all probability it would be demanded of the street railways in the future. He also cited an illustration of how frequent service had paid the street railway companies before the advent of the jitney. A number of years before when Mr. Cooper was in charge of the Galveston property he doubled the service and tripled the receipts. The riding habit increased because patrons found that they would have to wait only a short time for a car and that it was quicker to ride than to walk.

Another point brought out was that the public would have to decide between an all-jitney service and an all-street railway service. The street railway companies operated some lines at a loss even before the jitney bus came, but this had been offset by profits on lines carrying heavier traffic and having shorter hauls. The financial responsibility of the street railway company as compared with the jitney bus operators was also an important argument against this form of competition. The railway companies were also maintaining pavement in the track allowance and thereby contributing a large portion of their net earnings. The jitney buses contributed nothing specifically for the maintenance of the street, and in most cities there was nothing to prevent a jitney operator from going out of business at any time his route proved unprofitable. Aside from these arguments against the jitney service, it had unquestionably congested street traffic.

Following the jitney bus discussion a short time was given over to considering the merits of a light car. C. W. Rogers of New York City, said that a one-man car weighing about 11,000 lb. had effected a saving of approximately 37 per cent in Atlanta, Ga. D. A. Hegarty brought out the point that even though a light car was adopted, the larger type of car would still be required where the traffic was heavy. The type of car was largely dependent upon the character of traffic, Mr. Hegarty said, and it was unprofitable to operate a large two-man car on the line one part of the day and some other type of car at another time of day.

V. W. Berry stated that the modern type of car proposed by manufacturers will be a great factor in solving the jitney bus question and, at the same time, make it possible to give better service. He said that it was out of the question to give quicker service with cars of the size and weight that are now being generally used. Recent refinements in the methods of construction, however, showed that these were much heavier than was necessary. Mr. Berry also said that another way to give better service was to charge a fare of 6 cents or more, as some of the Massachusetts companies

were doing. In closing he stated that the present fare of 5 cents had been adopted only as an accident and as a matter of convenience and not because anyone had calculated that the 5-cent fare was reasonable.

Two contemporaneous sessions were held at the same time the railway session was in progress, at which subjects in accounting, and light and power were presented. The association president, D. G. Fisher, presided at the light and power session on Thursday morning. F. N. Lawton, manager Wichita Falls Electric Company, Wichita Falls, Tex., presented a paper entitled, "Boiler-Room Wastes and Economics." Other subjects presented at this session were of particular interest to central station operators. At the accountants' session a report of the committee on a system of simplified accounting for medium and small public utilities (railway, light, power, gas and water) was presented. This report was read and adopted in full. The session of both the light and power and the railway members, held on Thursday afternoon, was given over to an address by Charles B. Scott, secretary and treasurer Bureau of Safety, Chicago, Ill., on the subject "Important Factors in Accident Prevention."

At the Friday morning session of the association, a paper by F. R. Slater, general superintendent Texas Power & Light Company, Dallas, Tex., entitled, "The Advertising Influence of Employees" brought out a lively discussion. An abstract of this paper appears elsewhere in this issue, and the discussion was of particular interest to central station managers since it dealt largely with the sale of energy. In connection with the railway aspect of the subject, however, Mr. Meriwether of Dallas stated that the public naturally came in contact with the trainmen more than with any of the officials of the company. It was therefore important that the conduct of the men on the cars should be properly guided, because they were a great influence and potential force in shaping the feeling that the public had toward the company.

The final session of the association, held on Friday afternoon, was given over to a paper by Richard Meriwether, general superintendent Dallas Street Railway, entitled, "Welfare Work and the Education of the Employee." David Daly of Houston opened the discussion with the remark that one feature of the welfare work that had impressed him more than any other was the financial assistance rendered employees in periods of distress. Clubrooms completely equipped may fail to arouse the appreciation of the employee, but financial assistance in time of need makes him feel that the company is human and that it really has an interest in his welfare. Mr. Daly also mentioned a small pamphlet issued by the Galveston-Houston Electric Railway and known as "The Organization." This pamphlet contained heart-to-heart talks between the manager and the men on the job and was intended to encourage thrift and interest on the part of the employees in petty economies. Prizes were offered from time to time for thrift suggestions and a surprising number had been received. A. H. Warren of Galveston voiced the opinion that mutual benefit associations were very wonderful breeders of loyalty. It was important, however, that these associations so far as possible should be managed by the men.

At the short session on Saturday morning the committee which considered the president's address reported its approval and recommended that a permanent committee be appointed to act on matters involving the public relations of public utility companies. The report of the committee was adopted, following which the annual election of officers took place. David Daly, manager of the Galveston-Houston Electric Railway and the Hous-

ton Electric Company, was elected president; F. R. Slater, general superintendent Texas Power & Light Company, Dallas, Tex., was elected vice-president; H. C. Morris, Dallas, second vice-president; D. A. Hegarty, Houston, third vice-president; J. B. Walker, Dallas, treasurer, and H. S. Cooper, the present secretary, was re-elected to office.

ENTERTAINMENT

Association entertainment during the convention included surf bathing, dancing, smokers, card parties for the ladies and a Jovian banquet. On Friday evening, May 21, the Jovians held a rejuvenation and initiated fifteen candidates. Ell C. Bennett of Mercury presided at the banquet with 175 Jovians in attendance, including C. W. Hobson, Jupiter No. 1, and C. A. Newning, Jupiter No. 2. During the progress of the banquet there was a pause, and a tribute was paid to the late Elbert Hubbard, a Jovian who lost his life at the sinking of the *Lusitania*. Some abstracts of the papers follow:

PRESIDENTIAL ADDRESS

BY D. G. FISHER, ASSISTANT GENERAL MANAGER SOUTHERN TRACTION COMPANY, DALLAS, TEX.

Mr. Fisher's address treated principally of the effects of the current business depression upon electric railway problems and of the added complication introduced by the jitney-bus agitation. Before taking up these pressing matters he presented a brief outline of the history of the association since 1895 when it was the Texas Gas & Electric Light Association. It consolidated with the Texas Street Railway Association in 1898. He said, in substance, that during the past year the public utilities represented in the membership have been passing through a critical period because of the attitude of the general public toward all public utilities, as well as from the problems arising through the evolution of governmental regulations. There is a great need of effective publicity. Our systems of government are founded on the theory that the people rule, and that their final judgment is right. Surely, therefore, it is the part of wisdom to lay the railways' case fully and fairly before the tribunal to which they must appeal. There is a great need for closer co-operation between the public and the public utilities of the southwest. No better code of principles could be adopted, as a starter, than those laid down by President Wilson in his address before the mid-winter meeting of the American Electric Railway Association in Washington.

The European war has, to a large extent, brought on a lean year in this country, but with it one section of the association has been confronted with the motor-bus, or jitney. There may be commended to the consideration of all classes of public utilities the fact that there may be jitneys in other branches of public service also. As a matter of fact, every character of public service has its jitney. The lighting business has kerosene, gasoline and many other jitneys. The heating business has coal, wood and oil as jitneys, and the water business has cisterns and wells. The street railways have for a long time had their jitneys in small numbers, so small that their effect was hardly felt and but little attention paid to them; but suddenly, through unforeseen and unpreventable causes, the jitney grew from a dwarf to a giant in a few months. The lesson of the jitney should be taken to heart in every other kind of public service besides the street railways, and these industries should be in a better state of preparedness than was the street railway in this instance.

THE ECONOMIC LIMIT OF THE REPAIR SHOP BY V. W. BERRY, GENERAL SUPERINTENDENT NORTHERN TEXAS TRACTION COMPANY

The question of the economic limit of the repair shop of a public utility resolves itself in many cases into a question of where repairs stop and manufacturing begins. Undoubtedly many medium and large-sized properties are leaning entirely too far toward the manufacturing end, with the result that true maintenance is being neglected on account of the attention given to manufacturing.

Frequently the remark is made: "It can be made in our own shop, and will not cost much." Or, in answer to the question, "What did it cost you?" one hears the reply: "We made it in our own shop, and it really cost nothing." Nevertheless it is probable that the speaker could have purchased as good an article or better for less than the cost of manufacturing it in the shop. In many cases, too, it will be found that the work of manufacturing has distracted the attention of perhaps the whole shop organization, or at least some one branch, from the work of inspecting, caring for, and maintaining the equipment.

It should be remembered that this is a day of specialization. The larger public utility companies may in some cases be able to compete with concerns making a specialty of a certain article, if the consumption of that particular article is great enough to warrant special machinery and an expert to conduct a special department. Otherwise it is pretty safe to purchase the article on the outside. The specialty of the average repair shop is, or should be, maintenance and not manufacturing.

Frequently one hears the remark, after a new piece of equipment or a new lot of rolling stock is put in service: "We will not have to spend anything for maintenance for a number of years." Such thoughts, if put into practice, will surely make trouble. Maintenance commences the moment the installation is completed, and unless extreme care has been taken in selecting the proper apparatus or equipment, maintenance has already accumulated to a greater or lesser extent. The sooner a remedy is applied, in the way of careful inspection and prevention, the less liability there is of excessive maintenance costs later on.

With regard to the selection of equipment, efficient operation is all right, and must be considered; but one must not forget that repair economy is also important. After one breakdown the resultant repair bill may wipe out the saving of a year, incurred on account of a slight increase in efficiency in other respects. The tendency is sometimes to forget the question of maintenance, while on the other hand the tendency of those dealing with maintenance only is to forget almost entirely the question of efficiency in other respects. Right here, between the two, there is a gap which must be filled before the greatest economy in operation can be obtained.

Obsolete equipment, that has to be retained for want of something better, is frequently neglected, resulting in a high maintenance cost and unreliable service, and the blame is all laid to the fact that the equipment is obsolete. A careful investigation may show that it would be economical in the long run to replace the old equipment with new, but the company may not be able to get the money to do so. What is there to do? Continue to operate the equipment in a broken-down condition, with a high maintenance cost, or put it in as good condition as possible, and keep it so by inspection, prevention and repairs? There is but one answer. Operate it in good condition, or do not operate it at all.

TRACK CONSTRUCTION IN PAVED STREETS

BY B. R. BROWN, SUPERINTENDENT MAINTENANCE OF WAY
DALLAS CONSOLIDATED ELECTRIC STREET RAILWAY

There are two distinct general types of construction for track in paved streets. These are the track laid on gravel or rock ballast and the track which is built on a solid concrete foundation. Where the sub-soil is sandy or of a clay formation, excellent results can be had with the former. It has several advantages well worth considering. Regular cars can be operated over the ballasted track while the surfacing and lining of the track is under way. A careful going over and tamping of ties, under traffic of cars, before placing the concrete paving foundation, will insure smooth riding and substantial track. Track so constructed and operated over by 1500 cars each day, in Dallas, since December, 1912, has shown absolutely no defects, either in track or paving. There is not a loose joint or a loose paving block—the paving being creosoted wood blocks—on this entire piece of work, and not 5 cents has ever been expended for maintenance. Since that time two other sections of track, including several special work layouts, have been built in a like manner, and the results obtained in each case have been most satisfactory. Within the last year or so this type of construction has gained much favor in the larger Northern cities. In the South we have stuck doggedly to the solid concrete base and are just realizing that much money could have been saved, not only in the initial cost of the track, but also in cost of maintenance and of rebuilding had the ballasted type of construction been used.

When track laid on rock or gravel ballast is rebuilt it is only necessary to remove the top paving and base, old ties and rail and then rebuild, using again the ballast already in place. In the case of rebuilding track laid with a solid concrete base it is necessary to pry out the old concrete base, which is a total loss, and then buy new ballast to take its place.

If the sub-soil is mucky, soft earth or quicksand formation, or if the district is poorly drained, then the solid concrete base should be used.

There is also a third type of construction in use, which is a combination of the two types mentioned; that is, a sub-base of 4 in. of solid concrete upon which 2 in. to 4 in. of gravel or rock is placed for ballasting the track. This type of construction can be used instead of the solid mass of concrete with all the advantages of the ballasted track and is highly recommended and used by the street railway companies in Toledo, Buffalo, Minneapolis, Detroit and several other cities.

Next comes the proper selection of the ties, rail and fastenings. With either type of construction can be used the steel or concrete, or the sawed pine, oak or cypress tie, and preference between them is mostly a matter of personal opinion and local conditions. The writer prefers the thoroughly seasoned, 90 per cent heart, 6-in. x 8-in. x 8-ft. long-leaf yellow pine tie in the ballasted track and the steel tie where the solid concrete base is to be used. If of wood, it is most important that the tie be thoroughly seasoned before it is put in the track.

As for open construction, the A. S. C. E. sections of rail cover our needs thoroughly, but no such results have been accomplished in the standardization of rail used in paved streets. High T-rail should only be used in paved streets where traffic is light, drainage good and no interurban cars are to be carried. In residence districts, under these conditions, the 7-in. 80-lb. T-rail is quite adaptable. Under heavy traffic and interurban cars, the girder rail should be used. At the 1913 convention a 7-in. 122-lb. and a 9-in. 134-lb. girder rail

were adopted as standard. In Dallas the Lorain section 103-426 has been adopted and has satisfactorily fulfilled the requirements.

There are three principal types of joints in use—the plain angle bar; the reinforced joints, such as the Weber, Wolhaupter, Atlas and the Continuous joint, and the welded joint. The first type is obsolete, and the third type, the welded joint, is preferable, as it gives a continuous rail bearing and largely does away with future joint troubles. One objection to it is the high first cost, and also some trouble with breakages, usually due to indifferent workmanship. Of the second type of joints the Continuous is the most popular. It more nearly conforms itself to the web and base of the rail than either of the other joints of this class, and when properly applied with bolts drawn absolutely tight will give very little maintenance trouble.

A combination tie plate and rail brace on every tie will stiffen the rail and protect the tie from cutting and should be included in all types of construction. Either Harvey grip nuts or the steel bolt with high power nutlocks is recommended. The latter are gaining in favor, as the steel bolt does not stretch and the high-power nut-lock gives added strength and efficiency. Screw spikes are now universally used on all new construction work, the square spikes being as obsolete and inefficient as the plain angle bar.

The most vital factor for efficient maintenance of track is a well-organized repair force under the direction of experienced foremen. Where the system is large enough to warrant several gangs of men on track repairs, it has been found advantageous so to divide the work that each repair gang may be kept on specific classes of repairs. For instance, by having one force of men constantly on paving repairs, another for repairing joints and rebonding, etc., the efficiency of the men engaged in each class of repairs will be largely increased and the work more systematically carried on.

SPECIAL WORK

No company can afford anything less durable for the tracks in paved streets than "hard-center" work, and in most cases severity of traffic will warrant the greater initial cost of the manganese special work. Much stress has been laid on the so-called renewability feature of the hard-center work, but any mechanically jointed center that is easily detachable will be likely to detach itself when put under repeated strains. In the writer's opinion, this renewability feature is more theoretical than practical, for where centers are renewed on account of wear it is very difficult to make a good job by inserting new centers, for the reason that the surfaces seldom match up with the old work. The main drawback to solid manganese special work is the greater initial cost, but in most cases the additional life will warrant the greater outlay.

As special work does not wear out quickly and it is necessary to replace one or two pieces at a time, it should be set on rock or gravel ballast rather than on a concrete base. Particular pains should also be taken with its installation. More care in proper tightening of the bolts, in the aligning and surfacing of the layouts and other like precautions will greatly add to its life and save many a dollar in repairs.

PAVING AND ITS RELATION TO RAIL AND JOINTS

The most generally used classes of paving are: granite block, brick, bitulithic, asphalt and creosoted wood block. While the granite block is the most durable and most easily repaired, most cities will not permit its use because it is very noisy and slippery. Brick paving or vitrified paving brick was once very extensively used, but, being very brittle, it is short lived under heavy

street traffic and, since the introduction of the creosoted wood block, has become almost obsolete. It is also noisy, and although the first cost is less than blocks or bitulithic, the many objections to its use, together with the very high maintenance costs, have tended to make it unpopular.

For paving in residence districts the bitulithic or asphalt pavement is more adaptable than either of the other pavings, being a cheaper pavement than blocks, and under light street traffic will stand up remarkably well. One advantage in the bitumen paving is that it allows the concrete to come up higher on the web, thereby stiffening the rail. The main objection is higher maintenance cost and the inability of the street railway company to make its own repairs on account of the very expensive equipment required.

The creosoted wood block is perhaps the most extensively used paving, and in business districts is unquestionably the best paving for the city and for the company. It is noiseless, sanitary, durable and easily repaired. In the tracks the creosoted wood blocks can be put down by the company's own construction force, and necessary repairs can also be made by the maintenance force, without need of expensive equipment. The blocks should be laid with small expansion joints between them, to be filled with tar, to eliminate the buckling of the blocks which was the main source of trouble with our first wood-block paving. There is on the market to-day a block with small ridges on one side and one end that permits the blocks to be driven and still leave an expansion joint for the filler. The first wood blocks laid in the track gave considerable trouble, but by specifying a better treated block, by mixing cement with the sand and making a damp mortar cushion, by using a tar filler instead of crude oil and by more care in laying the blocks, an excellent paving can be put down that will give very little maintenance trouble and that will outlast any other class of pavement.

ADVERTISING INFLUENCE OF THE EMPLOYEE

BY F. R. SLATER, GENERAL SUPERINTENDENT TEXAS POWER & LIGHT COMPANY

The three best assets of any public utility are satisfied customers, a pleased public, and contented employees. From the highest to the lowest, the employees have a direct influence in producing all three of these conditions, and their advertising value, or their value as a means of identifying the company, its aims and its aspirations is very great.

Very few of us regard any business as a personal entity. Yet nearly always there is a human personality in it which influences us. The visible parts of the business are the local employees with whom we come in frequent contact. If these are courteous, if they show consideration, if they are inclined to observe the customers' rights, the business will gain good-will and confidence and will thereby become "identified" as a desirable concern with which to do business. That employee or group of employees which can produce this condition of good-will and confidence is a valuable asset to the company and is the very best advertisement that it can have.

Much has been said about good-will and what it is. In substance it is a company's reputation with the public for square dealing, which reputation is largely governed by the manner in which the company treats not only its customers but its employees. More adverse public criticism can be created by disgruntled employees than in most any other way. This is especially true in cases of personal injury. A humanitarian treatment of these cases, whether of the employee or the public,

will go farther toward "identifying" the company than any other one factor.

Every employee, no matter what his position, is a salesman: First, the employee must sell his services to the company and then, directly in proportion as he is contented or satisfied in his employment, he will sell his company's service to the community. On the manner in which those services are presented to the community by the employee will largely depend the favorable or unfavorable opinion and acts of that community with reference to the employer. "Advertising" of the wrong kind is a detriment, a loss, a liability that is cumulative in evil results. Advertising of the right kind, the favorable personal advertising of the employee, from president to office boy, is an asset that is cumulative of assets which can be obtained in no other way.

WELFARE AND EDUCATIONAL WORK AMONG EMPLOYEES

BY RICHARD MERIWETHER, GENERAL SUPERINTENDENT DALLAS STREET RAILWAYS

From answers to letters written to eighteen street railway companies it was found that fifteen of the companies had established mutual benefit associations among the men, and that eleven had adopted the club idea and had fitted up quarters with shower baths, pool tables, reading room, etc. The plans employed are very similar. The employee contributes 50 cents to 75 cents per month, and in case of sickness the association pays him from \$6 to \$8 per week after the first week of disability. The death benefit is from \$100 to \$500. The companies contribute in most cases enough money each year to keep the associations financially sound. In lieu of such an association, one company carries a blanket insurance policy for its employees, paying half the monthly premium of \$1.40 on a \$1,200 policy. Two companies take care of cases of distress directly through the management, and make loans to employees at low rates of interest. The majority of the companies have rooms equipped at the carhouses with shower baths, pool and billiard tables, reading facilities, etc., while a small number of companies have built separate and elaborate club houses.

Up to within a year ago the Dallas companies had done practically nothing in the direction of welfare or educational work among employees. The building of a new shop recently made space available for enlarging transportation quarters and providing a trainmen's lounging room, a room equipped with showers and toilet facilities, and an assembly room with a capacity of 300. These rooms were constructed with concrete floors, plastered walls with wainscoting, etc. A branch of the public library has been established in the trainmen's room, and 400 books are kept there. Twice a week a moving-picture show is provided by the company.

The members of the safety committees constitute also a welfare committee. The management advances money to those applying for assistance and deducts a small portion of each pay until the amount is paid up, making no interest charge. Cases of sickness or accidents are looked after by the company, and if the employee is unable to pay his expenses the company does so and allows the employee to repay them in installments.

In conclusion, it seems to me that welfare work and educational work are a means of breaking down the old barrier of distrust, suspicion and disloyalty which existed between the employee and employer, and substituting for them an understanding of their true relation and dependence of one upon the other for their mutual advancement and happiness. The extent of the work

should be limited only by the financial ability of the company and the wisdom of its officials, guarding always against paternalism, but striving continually to advance the comfort, happiness and well-being of the employee, thereby winning his co-operation and loyalty.

TRACK RECONSTRUCTION IN SAN ANTONIO

BY G. W. SMITH, ENGINEER SAN ANTONIO (TEX.) TRACTION COMPANY

Since October, 1913, the San Antonio Traction Company has had to rebuild many of its tracks on account of the paving program adopted by the city. In all of the reconstruction, except special work, steel ties are used. These are 6 ft. long and 3 in. deep, with a 5-in. upper flange and a 3-in. lower flange. They are spaced between 4½-ft. and 5-ft. centers, except that at the joints they are spaced on 2-ft. centers.

For building temporary tracks in the downtown sections, or on paved streets where the tracks must be surfaced up for wagon traffic, some flat steel ties were used. These are 1½ in. thick, 6 in. wide and from 5 ft. to 6 ft. long and are punched for use with standard steel tie clips and bolts with 60-lb. T-rail. Excellent results have been obtained with this construction, which is filled in with old asphalt which has been removed from the surface of the streets.

For tearing out the old gravel-ballasted, 60-lb. rails and substructure, jack pits are dug opposite each other on each rail and spaced 15 ft. or 20 ft. apart. Two 15-ton track jacks are placed opposite each other, one under each rail, and the track is jacked up. As the track is raised, men with sledge hammers knock the ties clear of the rails. For tearing out concrete construction where wood ties have been used, jack pits are dug opposite each other under each third tie. Six 15-ton track jacks are placed in consecutive jack pits, and the whole mass of rail, ties and concrete is raised to a height of 6 in. or 8 in. and blocked up by large pieces of broken concrete, rock, or old ties. Drill-pointed chisels, made from 1½-in. octagon steel, and 12-lb. sledge hammers are used to break up the concrete, the large pieces of which are hauled to the storage yard for future use in concrete construction where steel ties are used.

For the new track construction the excavation is made 6 ft., 6 in. wide in order that there will be 3 in. of concrete covering the end of the ties. The depth of excavation is 15 in. for suburban tracks and 16 in. for tracks in the downtown district. This gives 5 in. and 6 in., respectively, of concrete under the tie. When the excavation is completed to line and grade, the steel is brought in over the operating track on the work car, which carries twelve 60-lb. rails and necessary ties. After gaging, the track is brought up to line and grade, and alternate ties are blocked up on wood blocks with shingles used as wedges.

Sand, rock and cement for the concreting of the track are brought from the material yards over the new track in two-car trains of 10-yard capacity and are distributed along the street at the side of the track before the track is lined or leveled. The concrete is poured directly into the track and is cut under ties and rails. It is pulled along the track for a distance of 30 ft. on each side of the mixer and leveled up by a crew of eight men.

For the special work, 6-in. x 8-in. x 7-ft. 16-lb. treatment creosoted pine ties are used and are spaced not less than 2-ft. centers; 9/16-in. x 5½-in. spikes are used with these ties. The excavation is made 19 in. deep and 7 ft. 6 in. wide, so that there will be 6 in. of concrete under and 3 in. of concrete outside of the end of the ties.

In all of the track reconstruction work the rail joints are welded by the Thermit welding process, with inserts. Three days after the track is concreted the joint straps are removed, a space of 9/16 in. having been left between the ends of the rails, and the rails for 6 in. on each side of the joint cleaned thoroughly with a wire brush. The insert is cut from the ball of a rail of the same composition as those which are to be welded together, and is fitted nicely into the space, opposite the ball, left between the ends of the rails for this purpose. A flat file is used in making a nice fit between rail and insert. The first inserts were cut on a lathe and cost 46 cents each for labor. The company is now making them for 5 cents, including cost of saw blades.

The molds are designed so that the superheated Thermit will be carried around the flange, web, lip and lower side of the ball of the rail, ½ in. thick and to a distance of 1½ in. each side of the joint. The molds, made in two halves, are rammed on a foundry squeezing machine and are constructed with a bead around the faces, which come together so that these beads are compressed, thus making a tight joint.

The molds are left in place for about twelve hours after the Thermit is poured to allow the joint to cool gradually to the temperature of the surrounding air; then they are removed, the risers are knocked off and the weld is cleaned of molding material and examined. The weld holes are then thoroughly cleaned and filled with concrete. Just before the track is turned over for traffic, which is two weeks after the concrete is poured, the joints are ground down to a smooth surface by means of a power rail grinder. When the joint is finished it is not possible to detect either hollow or hump on the surface or gage line of the rail by means of a 2-ft. steel straight edge.

When compromise joints are made, wax is used for a pattern, the mold being rammed around it and the wax melted out by the preheating. If a number of compromise welds are to be made between any two sections, it is well to buy or make patterns, because labor costs in making welds where wax patterns are used is three or four times as great as when a regular pattern is employed.

These welded joints gave 100 per cent capacity for power returns on the straight track, but the transfer of the return current around or through the special work had to be taken care of by bonding. After some experimenting a Thermit weld was successfully made between the copper bond and the rail. This gives a contact area equal to or greater than the cross-section area of the rail. The cable used, which is 800,000 circ. mil, is welded to the lower side of the flange of the rail, and a section cut through the weld shows a shading in color from steel at the top to copper color at the bottom of the weld. The cable enters the weld at the bottom and is therefore in contact directly with the copper film at the bottom of the weld, which insures minimum contact resistance. This method of bonding is being used on all reconstruction work.

The company has made 3000 welded joints on track laid with concreted roadbed, and since the tracks have been put into operation there have been but two breaks in the rails; one of these occurred at a cross-over in the fall of 1914 and the other near a bridge in the winter of 1914. The first welds were made in winter of 1913.

A feature of the convention was the question box which was printed in pamphlet form and distributed to the members before the convention. An abstract of the questions and answers relating to electric railway practice will be published in an early issue of this paper.

Conference on Federal Valuation

About 250 men, including several from the Far West, attended the first session, May 27, of the conference called by the division of valuation of the Interstate Commerce Commission to afford the railroads and the state commissions an opportunity to discuss the various questions that have arisen in connection with the Federal work done thus far. The conference was held at the New Willard Hotel, Washington, with Charles A. Prouty, director of valuation, presiding. Thomas W. Hulme, general secretary of the Presidents' conference committee, was the general spokesman for the railroads, calling on various legal and engineering representatives of the carriers to answer the individual questions. Milo R. Maltbie represented the state commissions. Each side presented its case, but there was little rebuttal.

The first day was devoted almost entirely to the means of determining reproduction cost new. It was evident from the outset that the fundamental views of railroads and the state commissions differed widely. The former sought to have the railroad reproduced with present-day methods and prices, but from original conditions as far as they would involve expenses that present conditions would eliminate; they also argued that piecemeal construction and unforeseeable contingencies should be assumed. The state commissions, however, contended that reproduction demanded present conditions and an economical, continuous new construction program throughout, whether or not they would result in a fair value, and that contingencies that could now be foreseen be disregarded.

The railroads argued for an ample allowance for appreciation, emphasizing the increased actual value of a line adapted to requirements that had developed since the road was built, and of a solidified embankment and seasoned track. Mr. Maltbie contended that such adaptation as had required new culverts or other physical element would be accounted for automatically in the inventorying of such elements. He held, also, that solidification involved neither expense nor sacrifice, and should therefore not be recognized as of value for rate-making purposes.

The first day's session closed with an extended discussion of depreciation in its legal aspects by W. G. Brantley, speaking for the railways. He spoke of the chaotic state of this subject, and of the confusion between depreciation, meaning the amount of reduction in value due to deterioration, and the depreciation al-

lowance, the theoretical or actual sum set aside annually to pay for final renewals. He did not think mortality tables could determine the former, nor could it be arrived at by a narrow consideration of age alone, or condition alone, or both. Good judgment must be used in every case. He did not believe there was any real depreciation in a road properly kept up. Mr. Prouty reminded him that the valuation act required that reproduction cost new less depreciation be determined, but Mr. Brantley argued that in the case of track the track as a whole should be considered the unit, and not the individual ties, rails and bolts. On that basis, as the seasoned track with adjusted cycles of renewal was actually more valuable than if every element in it were new, it would be grossly unfair to deduct depreciation because some of the parts were old.

Women as Conductors in Glasgow

Since the outbreak of the war the question of platform labor has been a serious one in a number of the British cities. In Glasgow alone 700 men employed by the tramway department as motormen and conductors joined the army at the outbreak of the war in August. Since then many others have volunteered for active service and on April 1 the tramways were short of their full complement to the extent of about 350 men.

During this time the thought of engaging women to act as conductors naturally occurred to the management, and arrangements were made first with but two women who were connected with the permanent staff of the company and consequently were familiar with the punch and ticket system employed, to take up the duty for a few days as conductors. They started work on March 28 and were placed on special cars and later on regular cars, to do regular duty. Reports were obtained from them as to their views of the work, and the performance of their duties was also carefully noted by members of the staff. Many passengers, also, expressed their opinions. From all the women received every encouragement and assistance, and the conclusion reached was that the experiment was completely successful and had shown that, in an emergency at least, women could act as conductors on cars. Some ten more women conductors were added to the force the second week in April and there are now more than 100 women on the cars. The accompanying views show two of the women conductors in service.



WOMEN CONDUCTORS ON DOUBLE-DECK CARS IN GLASGOW

ANNUAL CONVENTION
SAN FRANCISCO
OCTOBER 4 TO 8, 1915

American Association News

ANNUAL CONVENTION
SAN FRANCISCO
OCTOBER 4 TO 8, 1915

The Minutes of the Meetings Held by the Equipment Committee and the Committee on Power Generation Are Given—Activity in Various Company Sections

COMMITTEE ON POWER GENERATION

As mentioned in last week's issue a meeting of the above-named committee was held in Pittsburgh on May 18. A brief abstract of the minutes of the meeting follows:

In accordance with its assignment of work the sub-committee on power station costs submitted a comprehensive report embodying a complete method of analyzing such costs, together with a set of curves illustrating the application to a typical station. As revised by the committee this report will consist of two parts, a subdivision of accounts and an appendix consisting of engineering and operating data records and charts, with data reduced to certain standards for comparison of plant operation. The purpose of the subdivision of accounts is to provide a means whereby the operator may know in detail what the plant is doing and what the detailed costs are.

After a discussion of the A. S. M. E. boiler code the report of the sub-committee on the specification for the purchase of fuel was considered. It contained a complete form of specifications for such purchase on a B.t.u. and ash basis. The committee decided to recommend a specification showing the general form and the items to be considered but without the use of actual values. An appendix will contain the ranges of values for the items covered in the specifications.

The sub-committee on a specification for power station lubricants presented a report on the qualities of lubricants and gave the results of tests, and it was decided to present the following: A typical specification for lubricating oil; an appendix containing definitions of terms, and a comparison of values of qualities of oils used successfully by the companies.

The results of a study of the A. I. E. E. standardization rules by a sub-committee were next considered and it was the consensus of opinion that they represent a work of great value to the electrical engineering profession. The meeting then adjourned after instructing the sub-committees to have revised copies of their reports in the chairman's hands by May 30.

EQUIPMENT COMMITTEE

The Engineering Association committee on equipment met in New York on May 17 as was stated last week. The minutes put over last week on account of lack of space are given below.

W. W. Brown, Brooklyn, N. Y., reported for the sub-committee on wires and cables, stating that efficiency or reliability of the installation as well as the matter of fire protection had been considered. After going over the proposed rules it was decided that they should be printed in their entirety in the committee's report and submitted for criticism to the member companies prior to the convention, the rules being presented as a miscellaneous method and practice for the association. The rules in question, it may be said, have received extended attention by a large and representative committee of the fire underwriters' electrical bureau, and it was decided to present formal notification to the prior underwriters' electrical committee regarding the action of the equipment committee as a basis for further action by that body.

Proposed revisions in the specifications for heat-

treated carbon steel axles, shaft and similar parts and for annealed carbon steel axles, shaft and similar parts, were then presented by Mr. Johnson. The suggested revisions were approved by the committee with minor modifications and it was decided to present them as standard practice for the association. A report on proof testing of forgings to determine their soundness after quenching and tempering was read and approved. This included a table for various heights of drop for a 2000-lb. tup and also a design for a gage for measuring the permanent set that might take place in proof-tested axles.

Mr. Dagleish then read the report of the sub-committee on gears and pinions. With minor modifications these were approved for presentation as recommended practice, including a qualifying statement to the effect that the methods in gear and pinion manufacture are changing so rapidly at the present time that the specifications would probably be subject to considerable revision at a later date.

A new design for a journal brass for high-speed service in accordance with the suggestions made last year by the ELECTRIC RAILWAY JOURNAL was then presented by Mr. Clark. The proposed design can be used with the present box and with the present standard journal either with or without a collar. It may be used also with the present standard wedge and the proposed new design of wedge may be used with the present standard brass, thus making the proposed standard flexible in every respect, and exceedingly easy of gradual introduction on any road. F. Kingsley of the ELECTRIC RAILWAY JOURNAL was asked to take up informally the matter of co-operation between the Master Carbuilders' Association and the American Electric Railway Engineering Association with regard to the new design, as it was considered that the interests of the two associations were identical in the need for a brass to eliminate the difficulty experienced with the present construction.

Specifications for air-brake hose were then presented by Mr. Johnson, and it was decided to propose these as recommended practice for the association. It was decided further to request the ensuing committee to consider oil-resisting inner tubes for brake hose as a supplement to this report. Mr. Garrett then read a report of the sub-committee on the design for a limit-of-wear gage. He stated that no universal gage was possible for all services because the wear of flanges was liable to take place in different ways upon different properties. After discussion the matter was referred back to the sub-committee to consider the possibility of using two standard gages, one for city service and one for inter-urban service. Mr. Clark then presented a verbal report of the sub-committee on the A. I. E. E. standardization rules, stating that there were no definite recommendations that would be submitted at the present time.

With regard to the subject of steel-wheel design Mr. Phillips discussed the possible desirability of making changes in the present standard flange contour and wheel design and, in connection with this, the committee decided to refer the matter of the new standard contour adopted by the Central Electric Railway Association to the incoming committee for consideration. Mr. Phillips spoke also of the coning effect produced when standard axles are used with track gages greater than

standard, especially when small wheels are used. He also spoke of the possible desirability of a change in the standard thickness of rim, but it was decided to let this matter go over until next year. He presented drawings of wheels ranging from 21 in. to 30 in. in diameter and it was decided to have a new general drawing made up to cover these and also the larger sizes, the old standard drawing not being complete.

Mr. Dagleish of the sub-committee appointed to review existing standards then spoke of the desirability of changing the present standard brakeshoe design to meet present conditions. He suggested that the standard type of platforms for city cars should be eliminated and that a new design of axle for the smaller motor and wheel was needed. A redesign of the standard wheel tread and flange contour was also discussed.

Mr. Phillips then brought up the matter of stranding tables with regard to flexible stranding ranges, and Messrs. Dagleish and Clark were asked to look into the question and report. Mr. Phillips also stated that he had been appointed to represent the interests of the car-equipment department on a special committee on lightning protection. He read a report of the last meeting of this committee as well as a paper which he had prepared to give an outline of the matter from the standpoint of the car-equipment engineer. The special difficulty existing at the present time was the wide difference of opinion as to the desirability of the earth grounding of the rails which was necessary for all lightning arresters that were mounted upon cars. The committee concurred in Mr. Phillips' views, and as no further business was to come before it, adjournment took place.

COMMITTEE ON POWER DISTRIBUTION

A meeting of the sub-committee on overhead materials on the committee on power distribution of the Engineering Association was held in New York on May 13 and 14. Those present were Charles R. Harte, New Haven, Conn.; C. L. Cadle, Rochester, N. Y.; G. W. Palmer, Jr., Boston, Mass., and C. F. Woods, Boston, Mass. The specifications for wooden cross-arms, iron and steel, including under this latter head specifications for wrought iron and mild steel, malleable castings, and commercial iron and steel, were put into final shape. In connection with this work a standard insulator thread was prescribed after consideration of advice from various manufacturers as to their practice.

MANILA COMPANY SECTION

At the meeting of the section, held on April 6, papers were delivered by J. M. Bury, assistant superintendent of transportation, on "Courtesy," and D. Solano, chief billing clerk, auditor's department, on "The Employee" (in Spanish). The local constitution was amended to give all departments of the company representation on the board of directors. The secretary stated that the section has now one associate and thirty-five active members.

In his paper on "Courtesy" Mr. Bury pointed out the peculiar temptations of the platform man to be discourteous. The public blames a great deal of its discomfort in transportation on the car conductors. The motormen, who are to blame for many of the conductors' troubles, should co-operate with the latter in this matter of courtesy. Mr. Bury was convinced that the local platform men have a good reputation for courtesy although they are not uniformly courteous. He pointed out the opportunities of the inspectors to study this matter and to promote pleasant relations between platform men and the public. Mr. Solano paid a tribute on

behalf of the employees to the present management of the company which gives them much more opportunity for expressing individuality than did the Spanish régime. His plea was for reasonable freedom of action for the employee which would enable the latter to use his native ability in co-operating with the company. Where the management tries to do all of the thinking for the employee conditions are not favorable to this end. To quote Mr. Solano's own words, from a translation furnished by Secretary W. A. Smith, "Any employee who has initiative and will, can reduce the burden of things that are obstructive or useless, without reversing the general order established by the responsible head and directors of the organization."

WASHINGTON R. & E. SECTION

The May meeting of company section No. 4, held on the 24th, was purely a social affair held in conjunction with the employees of the Potomac Electric Power Company. The occasion was "amateur night" and the pro-

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FAKE ADVERTISEMENTS FROM PROGRAM WASHINGTON SECTION MEETING

gram consisted of "stunts" of one kind or another, with prizes for best three. The attendance was 450.

The program was printed in a folder submerged in fake advertisements containing take-offs on prominent members of the companies' staffs.

DENVER TRAMWAY SECTION

The last meeting of the season of the Denver Tramway Company section was held on May 20. The meeting opened with a general discussion of the future conduct of sessions, especially regarding entertainment features. Many points were brought out for the benefit of the officers. The paper of the evening was by O. A. Waller, supervisor, on the topic "The Inspector and His Duties." The paper was discussed by E. T. Eckland, J. W. Dawson and many others. W. E. Casey, chief electrician of the company, was elected vice-president of the section to fill a vacancy created by the withdrawal of G. L. Rice from the service of the company. The attendance at the meeting was 110.

NEW ASSOCIATION OFFICES

As this issue of the ELECTRIC RAILWAY JOURNAL is being distributed Secretary Burritt and his associates are engaged in moving the association headquarters to 8 West Fortieth Street, near Fifth Avenue and but a few doors from the Engineers' Club. The necessity for this change is due to the impracticability of providing suitable office layout in the United Engineering Societies' Building and, after careful study of all possibilities, the executive committee selected quarters on the seventh floor of a new building in the immediate neighborhood of the present offices.

COMMUNICATIONS

Flange-Bearing Special Work

MINNEAPOLIS STREET RAILWAY COMPANY
MINNEAPOLIS, MINN., May 13, 1915.

To the Editors:

I read with interest the editorial on flange bearing special work in the issue of May 8, 1915. I have experimented with flange-bearing special work for crossings and so far the results obtained have been thoroughly satisfactory. The depth of flange used was $\frac{1}{2}$ in., and having had good results in the past I am now ready to use a still shallower groove, say $\frac{3}{8}$ in. The approach should be made as easy as possible and the length regulated by the length of the arms. The length of approach on our crossings is 18 in.

GEORGE L. WILSON,
Engineer Maintenance of Way.

MONTREAL TRAMWAYS COMPANY
MONTREAL, QUE., May 19, 1915.

To the Editors:

I have noticed the editorial in the *ELECTRIC RAILWAY JOURNAL* relating to flange-bearing special work.

Some years ago it was our practice to design the throatways of our frogs and crossings with a depth that was equivalent to normal depth of the flange, so that flange and tread wear were simultaneous. During the past two years we have experimented with the solid manganese work of a local manufacturer in decreasing the depth of throatway in the frogs and crossings by $\frac{1}{16}$ in., on two different occasions making the total decrease on the last special work which we had $\frac{1}{8}$ in. This permitted flange bearing across the intersecting gage lines, the ramp in the floor being 18 in. long. This intersection was installed about a year ago and was built of solid manganese, and at the present time the tread wear has not shown on the head of the rail. This company uses entirely chilled cast-iron wheels. There has been no undue chipping of wheel flanges that I can ascertain that is directly due to the shallow throatway. On a layout of hard center work, where the ramp of the floor was short, we have built up the throatway in the adjacent rolled rail by means of an electric weld. This has worked out very well, but unfortunately, owing to the manner in which it is built up, it does not last very long. We have also tried this on draw-bridge ends where grooved rail has been laid both on the bridge and on the abutment. This lasted about nine months before becoming tread ridden and tended to preserve the ends of the rails.

I question the policy of building up throatways in solid-manganese or hard-center special work for the purpose of raising the floor, except where the steel work at the intersection of the gage lines has signally failed, as the application of the intense heat necessary to make the addition to the throatway tends, without a doubt, to damage the manganese steel at a very vital point.

My judgment is that a flange-bearing throatway is desirable. To what extent the throatway should be built up, I am not prepared to say, as on one of the suburban lines on which we handle freight cars with M.C.B. wheels, we installed a frog with a throatway $\frac{1}{2}$ in. in depth. We were handling gondola class of cars of 100,000-lb. capacity, which belonged to a very large industry on this line, and after several months of service over this frog, the industry complained about the chipping of its flanges, and an examination by the division roadmaster and the superintendent of track indicated that this frog was the cause, although the ramp was very easy. The wheels on the gondola were all chilled iron.

This would seem to indicate that there is a limit to which the throatway can be raised. I think this subject is worth a great deal of attention from electric railway track men.

W. F. GRAVES, Chief Engineer.

WILLIAM WHARTON, JR., & COMPANY, INC.
PHILADELPHIA, PA., May 21, 1915.

To the Editors:

I am surprised to see the flange bearings at intersections in special track work referred to as if they were something new and used by only few electric railways. Flange bearings, or risers in street railway track work at intersections and at the entrance of mates to tongue switches, have been a general practice as far back as the writer remembers. In fact, when wheels with a tread width of 2 in. or less were used in many cities, it was absolutely necessary to support the wheel on the flange to prevent it from dropping into the groove in front of the points of acute angle frogs and mates.

With the somewhat wider wheel treads now in general use, wheels do not actually drop into the deep grooves. The amount, however, that a $2\frac{1}{2}$ -in. tread, or even a 3-in. tread, bears on the wing of an acute angle frog before it gets additional tread support on the point is so small that the head of the wing rail and the frog point cut down very quickly, and heavy pounding soon results. The introduction of flange bearings at these points, therefore, undoubtedly helps to prolong the life of the track structures.

On right-angle crossings, or those very near a right angle, the deep grooves, of course, cause the wheels to drop into the flangeways, thus producing a serious blow on the tread and rail head at the receiving side of the groove. If the wheel tread is narrow, this blow is distributed over a smaller area than if the wheel tread is wide. The width of wheel treads in general use on electric railways in city streets is not sufficient to distribute this blow over a large enough area to enable even a hard and tough metal like manganese steel to withstand the punishment very long without pounding down or even breaking out. Flange bearings in such crossings again help matters and reduce, or at least limit, the pounding.

While some electric railways, a few years ago, specified that they did not want flange-bearing special track work, very few if any went further than to require that the grooves at intersections be made just a small fraction of an inch deeper than the depth of the wheel flange. This depth really meant that wheels with worn treads were flange bearing, or, if all wheels were new, they pounded down the rail treads until the flanges rode on the groove floor. Special-work manufacturers, as a rule, have never given up the flange bearing when the design was left to them.

Flange-bearing special work came into disfavor with some railways undoubtedly because chilled-iron wheel flanges chipped or spalled out, and this was attributed to the flange bearing or risers in the frogs or crossings. The chipped or broken wheel flanges on the flange-bearing special work, in the writer's opinion, are due more to the speed at which cars run over such places than to the existence of the flange bearings. If the rule to run at slow speed over crossings and special work was strictly adhered to, very few breakages of this kind would occur. The writer remembers a case where the breaking out of the wheel flanges appeared very aggravated and was attributed to the risers or flange bearings in some newly-installed special work. Later, it was found that the cars with the new wheels for which this special work was installed ran fast over a piece of old straight track which was flange bearing, and this was the cause of all wheel-flange breakages.

The incline from the deep groove to the flange bearing, for at least its effective portion, should be made as gradual as possible to prevent the deep flanges from receiving a blow when they entered the shallow groove. In a recent discussion among a number of special-work manufacturers a rise of 1/16 in. in 1 in. was considered a maximum.

Theoretically, the depth of the groove at the flange bearing should be exactly equal to the depth of the wheel flange. It is generally considered more practicable, however, to make the depth of the groove slightly less than the depth of a new wheel flange. This allows the wheel flanges to cut their own path until, theoretically, the wheel becomes equally flange and tread bearing. Practically, as the wheels are not all alike, some of the wheels will run only on their flanges through these grooves until they have cut the path in the flange bearing deeper, while wheels with shallower flanges tend to pound the rail head down until they are simultaneously flange and tread bearing. Thus, provided the wheels are kept in fair condition, there will always be a large number of wheels in flange-bearing work that will not strike a heavy blow because the treads are assisted across the crucial point by the flanges. In other words, unless wheels are allowed to wear so that deep flanges are produced on many wheels, the flange bearing should perpetuate itself. With proper inclines and close adherence to the rule of slow speed over special work, broken flanges due to the flange bearing should be a negligible factor and the flange bearing a distinct benefit to the life of the special track work.

V. ANGERER, Vice-President.

Way Records on a Cost-per-Section Basis

NEW YORK STATE RAILWAYS

ROCHESTER, N. Y., May 18, 1915.

To the Editors:

The matters touched upon in the article in the issue of the *ELECTRIC RAILWAY JOURNAL* for April 3, are of considerable importance to engineers in charge of maintenance of track, and may be divided into two classes: 1, The recording and distributing of the costs of labor and materials used in track maintenance; and, 2, the recording of types and details of track construction, intimately related with the first class through the maintenance-cost item.

The article by Mr. Hulett is interesting not only on account of the fact that it describes how the cost data were handled in one instance, but it suggests possibilities which, if worked out in detail, would lead to a marked increase in efficiency in track maintenance. A few of the lines of thought suggested by this article may be of interest at this time.

With reference to the distribution of accounts, the first requisite is accurate and comparative data. If a system of accounting is used similar to the one described in this article and two sections of track are found to have the same general characteristics it is an easy matter to compare the maintenance costs and conditions of the track and thus obtain the relative efficiency of the different foremen in charge of the maintenance. A study of this may also lead to a comparison of methods used by the foremen, or to new methods which may be suggested. With the records obtainable a comparison of new methods with old would lead directly to more efficient operation.

Another matter of interest in this connection is that, with definite detailed knowledge of the cost of different items which go to make up the total labor cost of track, information may be obtained from which the engineer can tell what equipment it would be advisable or economical to purchase. For instance, the New York Cen-

tral Railroad Company has recently been experimenting with pneumatic tie-tamping equipment. In order to determine whether or not such equipment would lead to economy in track maintenance it would be necessary to know the actual cost of tamping a tie by hand and by machine, and it is detailed knowledge of this kind which is very essential to the engineer in his efforts to obtain efficiency. Another use to which this detailed knowledge can be put is in the making of estimates for future cost of maintenance, such as is described in Mr. Hulett's article.

Detailed data of the kind required are very difficult to obtain under the ruling of the various public service commissions or the Interstate Commerce Commission, on account of the fact that the different accounts permit of so many different items being charged to them. This is illustrated in the uniform system of accounts for street railway corporations, Second District of New York, in which all track labor covering distributing and placing ballast, renewing ties, repairing and relaying rails, joints, special work, etc., is charged to "roadway and track labor." While it is not necessary at all times to go into the minutest detail of keeping these accounts, yet there are occasions when these data are very valuable.

Mr. Hulett's method of sectionalizing track is very similar to the job-number system, and variations of the job-number system can be made which will enable the department distributing the costs of track maintenance to furnish the engineer with the required data. For instance, with the job-number system job No. 20 might cover a section of track, and job No. 20 sub-lettered "A" would cover the installation of ties on this particular piece of track, thus enabling the engineer to obtain the actual cost of installing ties, the remainder of the maintenance cost for the section being charged to job No. 20.

Another means of accomplishing a similar result would be to subdivide the account number. For instance, Account No. 8, "roadway and track labor," could be subdivided into account No. 8.1, which could be installing ties; account No. 8.2, surfacing track; account No. 8.3 hauling ballast, etc. Methods of this kind if properly used are of great value.

Another point is that different types of track construction in city streets can be given different job numbers even though both sections be on the same street, and maintenance costs kept separately on these separate types of construction. In this way data can be obtained showing the comparative costs of maintenance of different types of track construction, and data of this kind form the only basis on which an intelligent design of new types of track construction can be based.

This brings us to the second part of Mr. Hulett's article, with reference to keeping records of track construction. There are probably as many different methods of keeping these records as there are railroads, but the data should be kept, for it is only on these that an intelligent subdivision of a track for job numbers or sections can be based. Records of this kind are also necessary in reporting statistics to the state commissions or the Interstate Commerce Commission, and they are also very essential in making an inventory of the road or a revaluation of property which may some time be made of electric railways in much the same manner as is now being done by the United States government in the valuation of steam railroads.

In this connection a suggestion might be made that the different roads co-operate through the American Electric Railway Engineering Association with the idea of making track records more uniform in character. Studies as to the most efficient method of keeping these records would be of value not only to the roads themselves but also to the association on account of the fact

that they would then be able to obtain more accurate and uniform answers to questions which are sent out from time to time by the different committees.

While the matter of keeping records may seem small and to be left for a "rainy day," from my own experience I can say that this is a subject which can and should be given considerable study. It is possible, by systematizing the method of keeping records, to eliminate from 50 to 100 per cent of the labor required to keep them, at the same time decreasing the possibility of error and increasing the usefulness of the record.

Mr. Hulett in his article has given us the method used in solving, or attempting to solve, the problems on his road, which is exactly what each engineer must accomplish in his own sphere, and we should be grateful to him for his efforts to assist us by bringing a matter of this kind to the attention of engineers generally through the pages of this magazine. D. P. FALCONER,
Engineer of Maintenance of Way.

National Electrical Safety Code

NEW YORK STATE RAILWAYS
ROCHESTER, N. Y., May 18, 1915.

To the Editors:

The subject of safety has become such a vital part of every American's life that he hardly appreciates the extraordinary precautions which are taken by the vast majority of public utility corporations for the safety and welfare of their patrons.

Following the general trend of thought of the public, and appreciating the necessity for some standardization and some guiding hand of the community at large, the bureau of standards has admirably promulgated such a set of rules which can be used by practically every industrial and public service company. These rules are the result of thought and study by representatives of the bureau for two or three years.

The ELECTRIC RAILWAY JOURNAL has published several letters on this subject in which the writers point out certain rules, compliance with which might be considered a hardship by some public utility corporations. There undoubtedly are, as in most original drafts of such rules, various measures called for which would appear drastic to some companies and which, of course, if put in force might place these companies in financial embarrassment. It should be the duty, therefore, of all public service corporations and others interested to answer the communication of the bureau of standards and outline any objections which they may have to the proposed rules. If this matter is not brought sufficiently to the attention of the personnel of the bureau of standards, the operating companies should not expect to criticize the rules after they are adopted and promulgated.

The degree of safety which is to be insured in any particular case does not necessarily dictate the degree which is necessary in every locality. There is, therefore, always a chance for argument as to whether or not a certain condition is properly safeguarded. This must of necessity be left to the judgment of the man responsible for the protection of life and property.

In developing a set of safety rules one point that should not be forgotten is the relative hazard between different localities. In the article appearing in the May 15 issue, Dr. Rosa defends his position with relation to prescribing a local foreman to each particular job. In practically all cases this is, no doubt, the safe method of procedure, but there are cases where one foreman can supervise small gangs of men to advantage when they are not located at such a distance that he cannot readily get into communication with them either by person or by telephone. It is better, however, not to

have too many foremen as this is apt to disrupt the organization and to produce less safe conditions than when dependence is placed solely on one well-trained employee. The argument is always advanced by employees that a foreman should receive more wages than his subordinates. In the event that the safety rules apply this would materially increase the operating cost as the majority of the work is done by two men constituting a gang. This phase of the rules does not seem necessary.

The words "chief operator" have been used throughout the proposed code. The duties of the chief operator are prescribed in Article 430; namely, that he shall have the entire charge of the operation of the stations. Under the rules as prescribed, the chief operator would be a very busy man on a large system. A part of the duties prescribed to him would seem better left to the individual operator. For example, the chief operator is to instruct the station operator when to cut out lines for line work. After the lines are repaired and are ready to be cut in, the foreman in charge of the line work is to get in touch with the chief operator, who in turn will notify the operator in charge of the station to remove tags and allow the line to be cut in. There seems to be more danger when the operation passes through two hands than there would be in having the foreman report back to the operator.

The above paragraphs have been cited as showing the difference of opinion which will always exist on any set of rules, however excellent they may be. The bureau of standards cannot be held responsible for all of these differences of opinion, but should receive suggestions from all companies or individuals who are interested in the subject of safety or whom the safety rules will affect when placed in operation.

C. L. CADLE, Electrical Engineer.

THE CAPITAL TRACTION COMPANY
WASHINGTON, D. C., May 19, 1915.

To the Editors:

The various articles and communications which have appeared in different issues of the ELECTRIC RAILWAY JOURNAL regarding the proposed "National Electrical Safety Code" should receive the very careful attention of all electric railway men, for this matter is one of more far-reaching importance than may appear on the surface.

The scheme of promulgating a set of rules and specifications both for operating methods and construction details which, while not of any direct binding force in themselves, will prove a tremendous influence with state and municipal commissions, is a matter of such import as to merit the attention of the whole industry. The present-day tendency of regulating bodies to control in great detail all operations of the utilities under their supervision seems to the writer an unfortunate one which is not only unnecessary, but may result in crippling the initiative of our electric railway engineering force, which has been largely responsible for the wonderful development of the electric railway industry in its comparatively short life.

No criticism is intended of the spirit in which Dr. Rosa and his associates have undertaken and carried out their work, nor of the excellent results which they have in general obtained, but the effects of this work may be so far-reaching and important that it behooves every engineer and operating official of our utility companies to give the matter careful study in all its details and to make their criticisms and suggestions known either directly to the bureau of standards or through the association's representative, W. J. Harvie.

J. H. HANNA, Chief Engineer.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

The Cause of Thick and Thin Wheel Flanges

BY M. M. LLOYD, MASTER MECHANIC, DES MOINES (IA.)
CITY RAILWAY

A careful study, extending over a period of seven years, has convinced me that the principal cause of thick and thin flange wear on rolled-steel wheels is the difference in the wearing quality of the metal in the two wheels. Tests have demonstrated that this character of wear was not due to the fact that the trucks were out of square. Neither was it due to the difference in the diameters of the wheels, nor to the predominating curves and grades of the track, nor could it be attributed to the position of the gear and pinion. Thick and thin flanges develop regardless of any of these conditions and on both single and double-end equipment. Tests also showed that thick and thin flanges were not due to the position of the wheels on the axle, hence the only conclusion that could be drawn was that they were due to a difference in wearing qualities of the steel in the wheels.

It is only reasonable to expect that a slight variation in the chemical composition or the density of the metal will affect the wearing qualities. It is practically impossible to refine the manufacturing process to a point where all the qualities which may affect the wear are absolutely identical in the two wheels. It is possible, however, to delay this kind of wear by checking the trucks for square whenever wheels are turned and by taping the wheels to be sure that the diameters are exactly the same. Accurate centering of the wheels on the axle is also important and care should be exercised in this respect.

Derailments from Worn Flanges

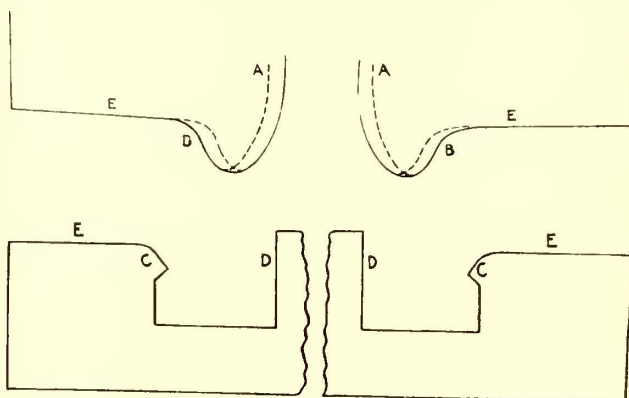
BY R. P. WILLIAMS, INSPECTOR OF SPECIAL WORK,
BROOKLYN RAPID TRANSIT SYSTEM

A common cause of derailment is the worn wheel flange. Fig. 1, in full lines, shows the perfect wheel flange; the dotted lines at *A* and *B* showing the wheel worn to the condemning point.

It sometimes happens that all of the wear occurs at *B*. This wear may be caused by shoe wear, or when a car is operated on a line where there are many curves of long radius, where the guard rail is not considered necessary. With the wear showing all at *B*, derailment is almost certain to occur opposite the mate point, this form of wear having the same effect as narrow-gage wheels. The derailment is caused by the lateral motion developed in the tangent track ahead of the switch. Following the inner dotted line at *B* into the full line *A*, it will be seen that a flange of fairly good shape still remains, the danger point not being readily detected by the single-flange gage.

Fig. 2 shows a standard wheel gage made from 1½-in. x 3/16-in. or ¼-in. steel bar which, properly made and used, will show this dangerous wear immediately. Points *C* and *C* of the gage are made to fit the perfectly

gaged wheels, point *D* of the gage corresponding to the fullest thickness allowed at *A* in Fig. 1. The distance, then, between *D* and *D* of the gage must be the proper distance between *A* and *A* of Fig. 1, on the wheels. To test for wear at *B*, place the surface *E* of the gage against the surface *E* of the wheel, bringing *C* of the gage snug to *B* of the wheel. If point *D* of the opposite



WORN FLANGES—FIG. 1—LIMITS OF WEAR; FIG. 2—WEAR GAGE

opening laps over *A* of the other wheel, the tendency to climb the tongue opposite the mate point is shown in proportion to the lap. After a little practice the operator will be able to detect this form of wear very readily. Should the flange wear have developed altogether at *A*, the mate side wheel may enter outside the mate point, or as it is termed, "straddle the mate," and cause derailment in that way.

Testing Motors for Electrical and Mechanical Conditions

BY A. P. LEWIS, SUPERINTENDENT OF POWER AND SHOPS,
CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY,
COLUMBUS, OHIO

Experience with different motors in high-speed service has led the mechanical department of the Cleveland, Southwestern & Columbus Railway to conclude that a potential test in excess of the line voltage is unnecessary. It also believes that a high-tension a.c. test of armatures is too severe, necessitating mechanical and electrical conditions which never are required in service, unless the equipment is struck by lightning, under which condition the high-voltage a.c. test is insufficient. Moreover, the mechanical department has found that nine out of ten cases of motor trouble are mechanical and that the remainder are due either to short-circuits, because water has collected in the motor, or because bearing wear has allowed the armature to come in contact with the pole pieces.

After an armature has been repaired it is tested carefully for "shorts" by the ordinary telephone-receiver method, following which it receives a potential test at

700 volts d.c. or the line voltage. As a final check on its mechanical and electrical condition, the repaired motor is mounted in the truck and made ready for service. In this position three of the motors in a four-motor equipment are disconnected and the repaired motor is made to move the car. This test is believed to be sufficiently severe to meet any service condition and at the same time assures an ample factor of safety to provide for emergencies.

Attaching Signal Wires to Third-Rail

BY G. H. MC KELWAY, DISTRIBUTION ENGINEER BROOKLYN RAPID TRANSIT COMPANY

On one of the large third-rail lines a problem presented itself a few years ago which would not be met with on railroads of any other type.

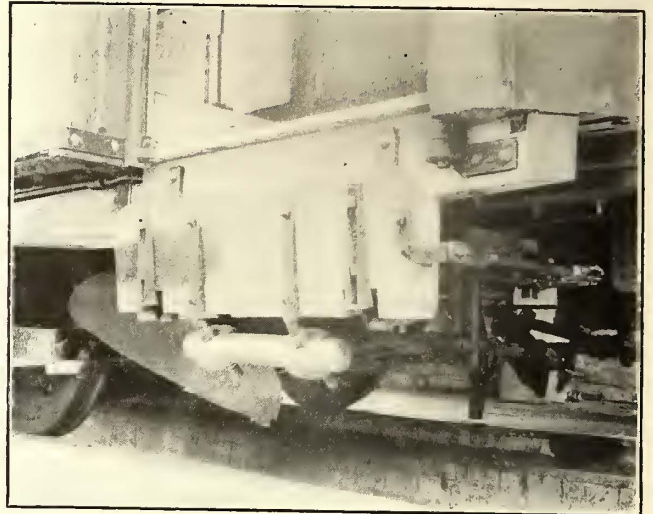
The problem was how to carry signal wires almost the entire length of the line without installing either a pole line or underground conduits. On most third-rail lines the tracks are paralleled with a high-tension line connecting the substations so that signal wires can be run either on the poles of that line or in spare ducts, if the wires are underground. In the case in question, however, neither of these facilities was at hand so that it appeared as if an entirely new and costly installation for the signal wires would have to be made. This, however, was avoided by attaching the rubber insulated signal wires either to the third-rail itself or to the insulators supporting it.

As shown in the accompanying illustration, three different methods of attaching the wires were tried out. Fig. 1 shows the method first used which, although the cheapest in first cost, was also the most expensive to maintain. Here the signal wire was tied to a porcelain spool insulator, which in turn was tied with a piece of wire around the cap of the third-rail insulator. A second plan, shown in Fig. 2, consisted of tying the signal wire to a spool screwed to a small block of wood, which was, in turn, bolted to the third-rail. Although the materials used with this method are in themselves very cheap, the labor of drilling the rail and fitting the wood blocks to it make the plan considerably more expensive than the preceding one. It, however, makes a much neater and more workmanlike job. Fig. 3 shows the

A Balanced Door-Operating Mechanism

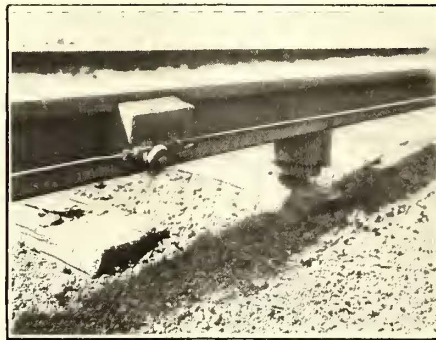
BY JOHN SUTHERLAND, MASTER MECHANIC TRI-CITY RAILWAY & LIGHT COMPANY, DAVENPORT, IA.

Ease of operation and insurance against failure governed the design and arrangement of the door-operating mechanism recently installed on the cars of the Tri-City Railway & Light Company, Davenport, Ia. The first



BALANCED DOOR-OPERATING MECHANISM — STEPS, COUNTERWEIGHT AND LEVER CONNECTIONS

requisite was obtained by providing a counterweight on the step sufficient to make the mechanism pass through the full cycle of movements after the operating lever had been released from the locked position. The use of the counterweighted mechanism also made it possible to employ lighter rods and to simplify the arrangement. The operating lever at the conductor's end of the car is at his stand in the center of the bulkhead. This lever is not permanently fastened to the operating mechanism, but like the motorman's controller and reverse handles, may be shifted from one end of the car to the other. The counterweight is 17 ounces lighter than the weight of the step, and is so mounted as to permit accurate adjustment. A view of the step and counter-

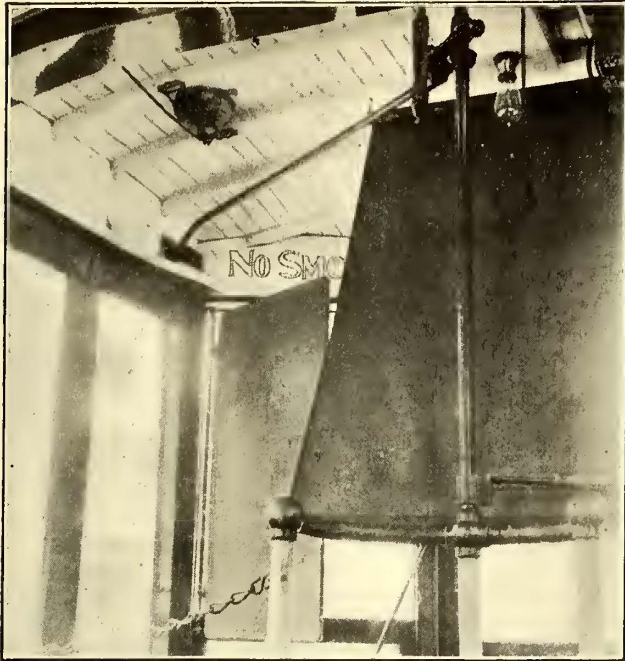


ATTACHING SIGNAL WIRES TO THIRD RAIL—FIGS. 1, 2 AND 3, SHOWING DIFFERENT ATTACHMENTS

last plan tried. In it the signal wire was tied to the porcelain insulator as before, but the insulator was made a part of a clamp fitting around one flange of the third-rail and fastened to it by means of a set screw. Such clamps can be purchased from stock and, while they are more expensive than the other fittings described, yet they can be put on the rail very easily and cheaply, making a job that is not only strong and permanent, but good-looking as well.

weight is shown herewith. The step-operating lever is attached to the base of the rod which passes up through the floor to the conductor's stand, and the door-operating lever is attached to a crank at the top of this rod. Both the steps and door are locked in position by forcing the cranks and levers beyond dead center.

The door-operating mechanism beside the motorman's position is also of the counterweighted type. The step shown is operated by the lever at the motorman's posi-



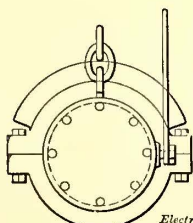
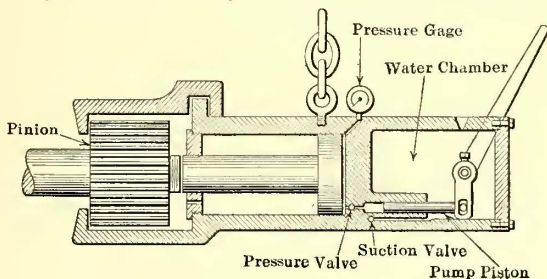
BALANCED DOOR-OPERATING MECHANISM—CONDUCTOR'S STAND AND DOOR LEVERS

tion, the mechanism beneath the platform being visible in the illustration. In a second view the conductor's stand and the lever and crank connections to the doors are shown. It is also interesting to note in this view the arrangement of the curtains to prevent interior lighting reflections from interfering with the motorman's vision through the vestibule windows. An ordinary curtain on a roller fixture, attached to the vestibule roof back of the motorman's position, is pulled down and hooked to the conductor's stand. Reflections on the two side vestibule windows are eliminated by two curtains on frames. These are mounted on rods with springs so that they will assume the correct position when the doors are closed, and when the doors are open the curtains are swung back against the windows.

Hydraulic Jack for Pinion Removal

BY J. G. KOPPEL, ELECTRICAL SUPERINTENDENT OF BRIDGES SAULT STE. MARIE, MICH.

The article by R. H. Parsons on the removal of motor pinions printed in the *ELECTRIC RAILWAY JOURNAL* of April 3, recalled to my mind similar difficulties once



Electric Ry. Journal

HYDRAULIC JACK FOR PINION REMOVAL

experienced in the removal of motor pinions in a large repair shop. The problem was solved by a special design of hand-operated hydraulic jack. The accompanying illustration shows the hydraulic jack in section. The jack was suspended in a small jib crane, mounted on a post between the car pits.

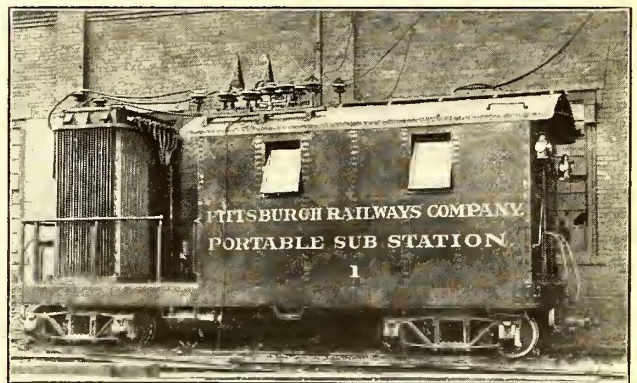
A car whose pinions were to be changed was brought to this pit, and each motor was transported via a pit carriage to a point where it would be clear from the wheels. Then the pinion was heated with a gasoline torch to about 100 deg. Cent., the jack was applied and the pinion removed by applying several strokes with the hand pump. If the pressure gage indicated that the pinion was abnormally tight, the pinion was heated again and the jack reapplied.

Portable Substation at Pittsburgh

The Pittsburgh Railways Company, one of the first traction systems to install an especially designed portable substation car, has recently made public the operating costs for its first year of service. During this time the station was in use intermittently for periods equivalent to about six months of continuous operation. The operating data follow:

OPERATING DATA FOR ONE YEAR	
Output	255,190 kw-hr.
Cost of operation:	
Wages	\$1,054.09
Supplies	57.76
Transportation and maintenance	189.20
Total	\$1,301.05
Operating cost per kilowatt-hour output for period of one year	\$0.0050

The substation, consisting of a 500-kw rotary converter, transformer and the necessary switching apparatus mounted on a double-truck steel car, was furnished by the Westinghouse Electric & Manufacturing Com-



PITTSBURGH RAILWAYS—PORTABLE SUBSTATION IN OPERATION AT CHARLEROI, PA.

pany. The cost of this outfit, complete and ready for operation, was between \$20 and \$22 a kilowatt. This is considerably lower than the cost per kilowatt of the average small substation.

The substation which was placed in operation in October, 1913, was first used to help out an overloaded industrial substation until a new one, with adequate capacity, had been constructed; next at a point where a country fair was overloading the local substation, and finally to delay for several months the starting of a small and inefficient steam plant which was used during the winter months to carry the peak.

The car, upon which the converting apparatus is mounted, was supplied by the Railway & Industrial Engineering Company of Pittsburgh. It weighs approxi-

mately 24,000 lb., and is constructed entirely of steel, with the exception of the window sash and doors. The side sills, center sills and body bolster are constructed of 12-in., 20½-lb. channels. The floor supports are of 6-in. 8-lb. channels, and the floor is of ¼-in. steel plates, fastened with counter-sunk rivets.

The cab, which is of No. 14 gage sheet steel, is 15 ft. long. The bulkhead at the end of the car is removable to permit the installation of the apparatus. In each bulkhead is a sliding door with glass windows. Above each door is a drop transom for ventilation. In each side of the cab are two windows, pivoted at the middle. Handholes with covers are provided in the floor to insure a good circulation of air in warm weather.

The trucks are the diamond arch-bar type, of 80,000 lb. capacity, mounted on 24-in. wheels. The principal over-all dimensions of the car are: length, 27 ft.; width, 8 ft.; weight, complete with equipment, 66,000 lb.

The high-tension, air-break switches, horn-gap fuses and lightning arresters are mounted on the roof of the cab. On the open end of the car is installed a 550-kva, 22,000—424-volt, three-phase, sixty-cycle, oil-insulated, self-cooled transformer of the outdoor type. Taps are brought out on the high-tension windings for voltages ranging from 10,000 to 22,000. The low-tension windings are provided with 3, 6 and 9 per cent taps, in addition to the 37 per cent taps for starting the converter.

In the cab are installed a 500-kw, 600-volt d.c. six-phase, sixty-cycle, 900-r.p.m., rotary converter, switchboards and necessary rheostats. The converter is mounted on special supports, designed to permit leveling for any grade on which the car may be installed. The switchboard panels are installed at either side of the door nearest the transformer. Connections are provided for starting the converter from the d.c. side, in case the station is operated from a line upon which starting from the a.c. side would be objectionable.

The double-throw a.c. starting switch is mounted underneath the car floor and is completely inclosed within a removable sheet-iron case. This switch, as well as the high-tension, air-break switch on the roof, is operated from the a.c. switchboard panel in the cab.

A light framework, covered with canvas, in which are provided mica windows and flap doors, incloses the space between the cab and the transformer. In this inclosure are provided a table and chair for the convenience of the operator in making out reports. A portable electric heater is carried on the car during the winter months. When the station is operating the heater is placed in this inclosure. When the station is not in service the heater is placed in the cab and serves to prevent sweating of the walls and equipment.

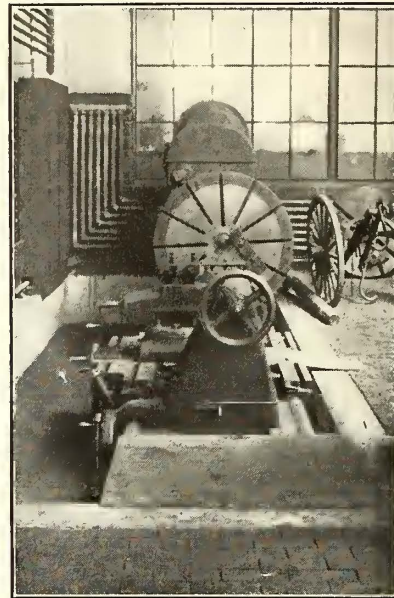
A desk telephone set is installed and connection is made to the nearest company line, so that the operation of the station may be supervised by the load dispatcher. The station is operated by any of the emergency operators of the electrical department. When not in use, the car is kept in the most convenient storage yard.

The station has been in operation, intermittently, for about twenty months, and very little trouble has been experienced. The parallel operation of the station with near-by stations has given no trouble whatever. The use of an equalizer cable has been found unnecessary when operating at a distance of more than three-quarters of a mile from every rotary-converter station.

Through a typographical error the word "to" was inserted before "\$2,000" in the article on the subject "The Special Work Shop," printed on page 992 of last week's issue. The sentence should read "if the railway has an unoccupied building, the cost could be reduced \$2,000."

Locating a Lathe in a Floor Recess to Facilitate Wheel Handling

In the repair shop of the Holyoke (Mass.) Street Railway the handling of car wheels at a 42-in. engine lathe is made convenient by the mounting of the lathe



ENGINE LATHE LOCATED IN PIT

in a pit in the floor 20 in. deep, 20 ft. long and 7 ft. wide. The wheels are practically rolled into place in the machine, a few inches lift being given by the shop crane for the final placing. A jib crane will shortly be placed over the tool for this service, releasing the main crane for other work. The lathe is driven by a variable-speed motor and the location in a pit does not inconvenience the operator, as he stands upon the wooden block pit floor, the controller

handle being about 22 in. above this. A short flight of steps leads into the pit, which has concrete foundations for the lathe itself. An end view is shown.

Why Midi Railway Chose Flexible Instead of Rigid Overhead

After trying one type of rigid overhead construction, one type of catenary without tension take-up devices and five types of catenary with tension take-up devices, the Midi (Southern) Railway of France decided recently in favor of the second form, namely, a simple non-compensated catenary. This means that the company will follow American rather than European catenary practice. The favored construction consists of a steel cable of 40 sq. mm (about No. 1) cross-section and a conductor of 100 sq. mm (about No. 0000) cross-section. The rigid system comprised a triangular truss which was vertically suspended through hangers from a heavy cable. (See ELECTRIC RAILWAY JOURNAL, page 26, July 6, 1912.) Some of the systems with tension take-up features had compensating devices for the contact wire only, while others had such devices for both contact and catenary wires. The non-compensated catenary was chosen because it would cost \$480 to \$640 a mile less than the compensated systems, and unlike the rigid system it could be operated with standard current collectors.

It was found that when the contact wire was horizontally adjusted at the average temperature, the difference between its highest and lowest positions was only 27 mm, compared with 235 mm for ordinary single-wire suspension.

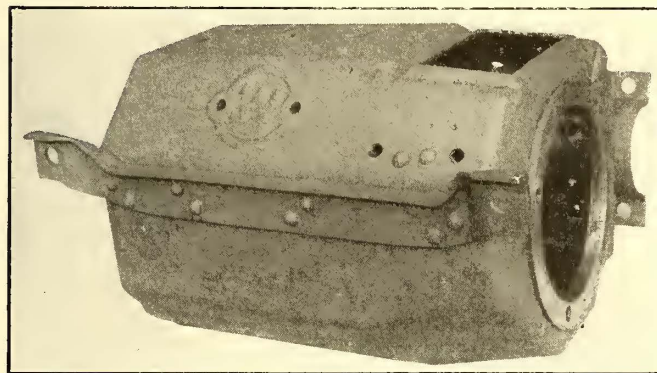
The Midi Railway is using single-phase current at sixteen cycles, 12,000 volts on the trolley. The energy is transmitted at 60,000 volts. The sections now equipped follow: Lourdes-Pierrefitte, 13 miles of single track; Ille-Perpignan, 13.6 miles single track, and Tarbes-Lourdes, 13 miles of double track. Old rails were used as poles until the supply was exhausted, whereupon lattice poles were purchased.

Pressed-Steel Motors on a Cleveland Car

The first of the pressed-steel railway motors which were exhibited by the Westinghouse Electric & Manufacturing Company at Atlantic City last October are now being tried out on the Cleveland Railways, and their performance under regular operating conditions will be watched with interest by railway managers, to whom the problem of cutting down the dead weight of car equipment is always of interest.

The use of pressed steel for frame and details, while a decided novelty for railway service, has already met with marked success in the industrial field for which the Westinghouse Electric & Manufacturing Company developed a line of pressed-steel d.c. motors six years ago. The inherent advantages of this construction led to the design of a standard line of a.c. motors, embodying the same features, which proved equally successful in industrial service, and this led to the present design for railway work.

The type of motor used on the Cleveland car, No. 330, is rated at 40 hp at 500 volts, and weighs 2100 lb. The corresponding motor with the cast-steel frame, No. 340, which is the lightest of its type ever built, weighs 2325 lb. Comparing the new motor with the lightest 40-hp low-speed motor of about two years ago, there is a saving of approximately 530 lb. per motor, or a total saving of more than 1 ton in the case of a four-motor equipment. In addition the pressed-steel construction permits a decrease in the size and weight of the wheels, with a consequent lessening of the height of the car



PRESSED-STEEL MOTOR FRAME WITH RIVETED CONNECTIONS

floor. The new Cleveland car that is equipped with the pressed-steel motors has wheels 26 in. in diameter.

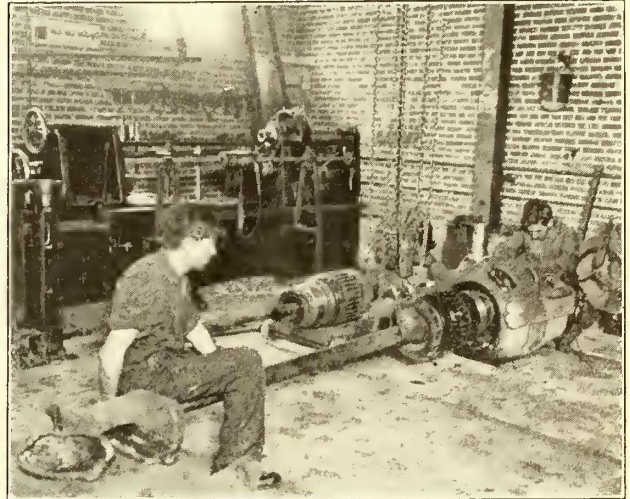
With cast-steel motors, it is practically impossible to avoid variations in the thickness as well as a certain amount of blow holes, sand, etc., in the castings. Consequently the torques exerted by various motors of the same design for a given current always vary to a certain degree, and this results in an unequal distribution of load among the several motors on a car. With a pressed-steel motor, however, the material is not only absolutely uniform but may also be worked to exact dimensions, resulting in uniform torques and equal distribution of load for all motors. It is possible, therefore, to design motors with pressed-steel shells with a much smaller allowance for manufacturing irregularities, a fact which will permit still further reduction in weight.

The manufacture of these motors involves the use of special hydraulic presses, the various parts of the motor such as the yoke, the two halves of the frame, the axle bracket, etc., being hot-pressed from sheets of open-hearth steel, and then riveted together. The electrical construction follows standard Westinghouse practice.

The motor is of the ventilated type, air being drawn through ducts in the armature and passed also between the pole pieces.

Using a Crane and Pipe to Handle Armatures

The accompanying illustration shows how a 3-ton Chisholm & Moore crane is used in a small shop to facilitate the removal and replacement of armatures without placing the motor on end. As illustrated, the crane hook is inserted in a sling which is carried around a long

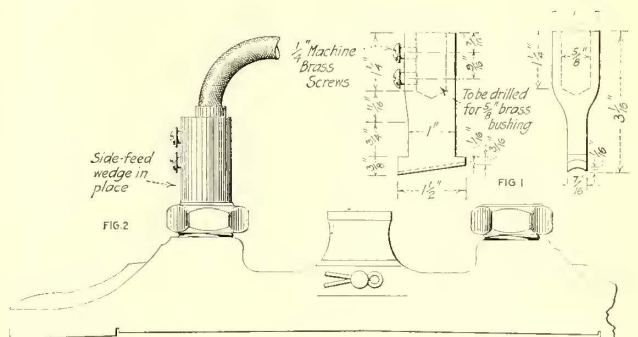


CRANE AND PIPE USED TO HANDLE ARMATURES

piece of cast-iron pipe. One man places this pipe over the armature shaft for use as a lever, so that with the aid of the crane two men can readily guide the armature to its place in the shell and to the low armature truck shown at the left.

Combination Side-Feed Wedge for Splice Ears

Often in overhead electric line construction and maintenance, it is necessary to install a splicing ear at a point where a feeder ear is required. To obviate the necessity for both types of ears at these locations, combination side-feed wedges, similar to that shown in the illustration, are used on the lines of the Brooklyn Rapid



B. R. T. SPLICING EAR—FIG. 1—SIDE-FEED WEDGE; FIG. 2—TYPE "N" EAR WITH SIDE-FEED WEDGE

Transit System. These wedges have given thorough satisfaction. The assembling of the wedge in the company's standard Type "N" splicing ear is also shown. The composition of these wedges is the same as that used in the company's standard trolley ears.

News of Electric Railways

NEW YORK COMMISSIONERS EXONERATED

Members of the Public Service Commission for the First District of New York were exonerated on May 26 by Governor Whitman of charges of misconduct in office and neglect of duty. The Governor made no report on his findings in the cases of the upstate commissioners. In arriving at his decision not to dismiss any of the first district commissioners Governor Whitman pointed out that there was no appeal from the decision of a governor to dispose of charges filed against State officials. He said that the personal integrity of the commissioners against whom charges were filed had not been impugned. Regarding the testimony taken by the legislative investigating committee, the Governor said that it showed that regarding the work of subordinates of the commission, who sought to secure action upon complaints against the Brooklyn Rapid Transit Company and the Interborough Rapid Transit Company, satisfactory results were not effected in many instances and that the commissioners themselves did not give their subordinates the necessary support. There was also evidence that all of the five commissioners failed to proceed as promptly and diligently in disposing of matters taken up by them in formal hearings as their obligation to the public required. He expressed the belief that the proper orders of the commission will be enforced in the future, and said that he will hold the commission strictly responsible for any failure of effort to secure such enforcement. The fact that he had received absolute discretion did not justify him in disregarding simple and elementary rules of evidence. He had no doubt whatever that were his actions reviewable an appellate court would reinstate the commissioners were he to remove them on the evidence before him.

TOLEDO ORDINANCE PROVISIONS DISCUSSED

A communication from City Solicitor Thurstin was read at the meeting of the Council committee on railways and telegraphs at Toledo, Ohio, on May 19. It related to the municipal ownership ordinance and the \$8,000,000 bond issue authorized to pay for the local street railway and light property. In reply to the committee's inquiry for more details as to the plan authorized by the ordinance, Mr. Thurstin said that the form of the bond would be similar to any other municipal bond, and the trust deed would be similar to the deed used by railroad corporations or such as would be approved by the United States Mortgage & Trust Company, New York.

F. R. Coates, president of the Toledo Railways & Light Company, and Thomas H. Tracy, attorney for the company, met with the franchise committee of the City Council on May 14 to discuss the tentative draft of the conditional franchise that had been prepared by the committee. Mr. Tracy first objected to some of the provisions in section No. 6, especially that which provides for a two-thirds vote of Council in establishing the rate of fare for any five-year period. He also objected to the provision that under certain conditions the return on the investment shall be only 4 per cent. Mr. Tracy said that it is impossible to tell what the developments of the future will bring. As an instance, Council had within the last two years enacted a 3-cent fare ordinance, when the members knew that this rate would barely pay operating expenses. He insisted that provision should be made for compensation to the company for losses each time where they could be shown to have been the result of the rate of fare established by Council for any five-year period. Mr. Tracy also objected to the section which extends the workmen's 3-cent fare to 8:30 o'clock in the forenoon and to the phraseology of the portion regarding universal transfers. No agreement was reached in regard to any of the sections of the ordinance which were discussed.

The Toledo, Bowling Green & Southern Traction Company has sent a communication to the Council in which it refused to comply with the order of that body to carry passengers to and from parks and cemeteries within a mile of the corporate lines of the city for the same fare as charged within the city. The company said that the State law on fares did not apply to it.

PENNSYLVANIA RAILROAD PUBLICITY

How the Company in Various Ways Takes the Public Into Its Confidence

At the recent hearings before the United States Commission on Industrial Relations in Washington, D. C., the publicity policy of the Pennsylvania Railroad was described in part as follows:

The company started its publicity work some nine years ago by first inaugurating a plan of full publicity regarding all accidents on its lines. Since that time the work has been extended to cover the activities of all departments. The railroad makes an effort to see to it that what the press publishes about the railroad shall not consist of complimentary notices about the railroad or its officers, but facts of consequence. It endeavors to see to it that in all matters the public learns what the railroad believes to be the truth. The railroad tells its story, tells it frankly, tells it fully, tells it often, and tells it with a view to its being understood and carrying conviction.

An essential principle back of the publicity policy of the Pennsylvania Railroad is this: If it is going to be able to work out its problems properly, it has got to be believed in. It must get imbedded in the public mind what is in all truth the supreme fact of the situation, namely, that it is doing its work as best it can and doing it, in the main, exceedingly well, doing it as well as, if not better than, the railroad business is being done anywhere else in the world. In short, the company endeavors to secure the help of the public in working out its problems. To do that it must acquaint the people with its problems.

The first plan of distribution worked out was to give information verbally and in printed form to the press in Philadelphia, and then to send, when there was time, copies of that information to the papers throughout the system direct. A plan was then developed whereby representatives of the company at various points were appointed to deal with the press in each place. In some cases it was the general superintendent, in other cases the superintendent, or the agent or some other employee, as the case might be.

The Pennsylvania Railroad never pays any newspaper anything to print anything as news, or as an editorial regarding its service. It wants the papers to feel that if it gives them any information, they can do as they wish with it—publish it or throw it into the waste basket. What they do does not affect in the slightest the attitude of the company toward them.

Mr. Rea said, shortly after he became president of the Pennsylvania Railroad: "Do not ever ask any newspaper not to print anything that is so; if it is bad let them print it, because in that way the matter will probably be brought to my attention so that we can have it corrected. The only thing we want to ask of newspapers is that when they do mention the Pennsylvania Railroad or they mention railroad matters generally, they publish the truth in small matters as well as in great."

These instructions given by Mr. Rea are typical of the principles the company follows in its publicity work, as well as in all of its other activities.

It has been found that it is not wise to depend entirely upon the newspapers; that there is a very much broader field to cover and that the company must study methods of getting the attention of people, to get into their minds ideas which it could not get to them through the newspapers. A study was made of the railroad's own constituencies. It was found that the Pennsylvania Railroad System has at least 112,000 shareholders. Bondholders are estimated at something more than 200,000, though a great many of them are not registered. The company also has its employees, of whom there are between 200,000 and 250,000 on the lines east and west of Pittsburgh. Of course, it is a very difficult thing to get at so many men. The idea of publishing a magazine has been considered, but that would be a very large undertaking. The company, therefore, started out by publishing leaflets giving certain details of operation. These are not sent to everybody; one, for example, is sent almost entirely to the men on a certain division; in another case

it may be sent very largely to the men on a grand division; in another case to the locomotive engineers. The idea is to get before the employees facts of interest which the management feels will be instructive and of benefit to these particular men.

In addition to the employees, there are the railroad's passengers—about 150,000,000 a year. This means that every day of the year some 500,000 people take Pennsylvania Railroad trains. To get them interested is a large undertaking. A plan of publishing bulletins to be posted on station bulletin boards was adopted. The theory is that in publishing these with more or less frequency and getting even a small percentage of these 500,000 people a day that take the trains to read them, the company will be able to implant in their minds thoughts and facts—not too heavy—which will cause them to think and to discuss the affairs of the railroad and railroads generally with their neighbors.

RAILROAD ADVERTISING

Edward Hungerford, advertising manager of Wells-Fargo & Company, formerly with the Brooklyn (N. Y.) Rapid Transit Company and before that with the Erie Railroad, presented a very interesting paper before the Canadian Railway Club at Montreal recently on the subject of railroad advertising. Mr. Hungerford said that no matter how advertising on the railroads had progressed, he thought he was fair in saying that the advertising manager on the railroad had not been permitted to make similar progress. No one dared to doubt the final decision of the members of the legal staff in matters affecting their branch of the conduct of the railroad business and executives did not change the structural plan for bridges or the detailed profile for a projected line across new country. Just as the legal department of the railroad was its defensive wing, so should the advertising department be its offensive. The advertising manager should sit alongside the general manager and the traffic manager, the counsel and the comptroller. He should be freed from the detail and left to plan the publicity of the railroad in its every phase. He did not believe that railroads had yet used paper and ink to the greatest advantage to fight most of their battles for public sentiment, in repelling the attack of unjust legislators and commissions. As a rule if the railroads have advertised for public sentiment through the newspapers it has been an eleventh hour measure adopted in a great crisis. With respect to the advertising of the railroads in regard to full-crew legislation and similar matters Mr. Hungerford suggested that the railroads had doubtless studied the excellent results obtained by the policy of advertising of the telephone companies. This was a splendid example of the use of advertising of the highest type by a public utility. He also thought that they had read the printed record of the individual campaign waged by the Toledo Railways & Light Company, or the campaigns of various traction and lighting utilities which have handled such problems and handled them intelligently. On the whole, however, the railroads had not taken hold of the great questions of public policy and grasped them with the strength that some other businesses have shown. He thought this was due to one thing, namely, that the advertising manager of the railroad had not compelled himself to be recognized as an executive of the railroad organization.

CINCINNATI LOOP MEASURE PASSED

The Bauer bill, providing for the construction of a rapid transit loop in Cincinnati, has been passed by the Ohio House, after being amended in such a manner as to prevent the issue of bonds above the amount defined by the Longworth law after the construction of the loop is completed. Because of the legislation that must be enacted by the Cincinnati City Council, there will be just sufficient time to submit the bond measure to the voters at the fall election. The Pink bill, relating to the construction of the subways for the rapid transit loop, has also been passed. This gives the city all the State legislation necessary for allowing the construction of the much-desired loop, which will provide an entrance to the business section of the city for all interurban lines and give a rapid transit service to many of the outlying portions of the city. Under this law the Mayor of Cincinnati will appoint a rapid transit commission of three

members and the loop will be constructed under its supervision. When completed, it is probable that the loop will be operated by the Cincinnati Traction Company or some other company interested in the suburban or local business.

NEW WORKING AGREEMENT UP IN CHICAGO

The present agreement between the Chicago surface and elevated railways and their employees expires on May 31. Negotiations for a renewal have been under way for the last two weeks and the essential points regarding working conditions were apparently disposed of without serious difficulty. When President Leonard A. Busby informed the union's representatives that there could be no increase in the wage schedule at this time the negotiations came to an end. In summarizing the situation Mr. Busby gave out the following interview:

"The proposition submitted by the men called for certain changes in working conditions and an increase in wages. We have been able to work out a material improvement in working conditions. With reference to the request for a wage increase, I produced for the inspection of the committee our records showing our loss in gross receipts during the last eight months. This loss has now reached the sum of more than \$4,000 a day. I told the men that under these conditions an increase in wages was not warranted at the present time. I, therefore, offered the men a renewal of our present contract with improved working conditions and the present wage scale. The entire matter is now in the hands of the employees' committee for consideration."

The result of these negotiations has been laid before the employees, who, according to the laws of the union, cannot strike without first offering arbitration to the company. Arbitration would be acceptable to the company and it is generally believed that this method of settlement will be accepted by the employees.

DECISION IN OHIO TAX CASE

In the case of the Ohio Traction Company against the Ohio State Tax Commission, the State Supreme Court has rendered decisions under both the Langdon act and the Hollinger law of 1911, pertaining to excise taxes. The court held that under the Langdon law electric railways must pay an excise tax of 1.2 per cent only on the revenues derived from actual operation of roads under their control, but cannot be held for the earnings derived from securities of subsidiary companies. The court decided that under the amended Hollinger act railways must pay the excise tax on buildings owned, but that they cannot be held for tax on the income derived from subsidiary companies. Under the decision, the collection of interest or dividends on the securities of underlying companies is not considered as the transaction of railway business under either of the laws, but in the second instance the use of buildings and receipts from them, as in the case of the Cincinnati Traction Building, is considered a feature of railway business.

DETROIT ARBITRATION DECISION

Motorman Peter Whaling, because of whose dismissal by the Detroit (Mich.) United Railway the union motormen and conductors went on a one-day strike, was ordered reinstated by a majority of the board of arbitrators which closed its session on May 27. James Couzens, of the Municipal Street Railway Commission, and J. V. Cunningham, State Labor Commissioner, agreed upon the reinstatement with back pay, while S. T. Crapo, the third arbitrator, dissented. The majority of the board admitted that Whaling was not a first-class motorman, but said that he was no worse than some others. They recommended that stricter discipline and higher requirements for motormen be maintained by the company, although they did not point out how this was to be done when the company in this instance, by their decision, was debarred from discharging a motorman whose record showed sixty-odd offenses against rules, including many instances of unsafe operation. Mr. Crapo, who voted against the reinstatement, declared the testimony showed that Whaling lacked judgment and was wanting in ability to state facts correctly. He held that as a matter of public safety the standard of motormen should not be low-

ered, and declared that such would be the case if Whaling were reinstated.

Immediately after the decision had been announced, F. W. Brooks, general manager of the company, issued a statement in which he characterized the action of Arbitrators Couzens and Cunningham as an outrage, and said that "the finding shows this arbitration a ridiculous farce and offends every sense of fairness." Mr. Brooks declared the decision "surprisingly in conflict with the testimony," but said that the company would reinstate the man, "knowing him to be an incompetent motorman and an improper person to compel the public to come in contact with or trust their safety to." He added that the decision "seems to establish as a standard for motormen the characteristics of recklessness, untruthfulness, perjury, dishonesty and the practices of a thug."

Mr. Couzens, as a third member of the board, blocked every effort of the company to get Whaling's entire record before the board, and practically every decision which he made on the admission of testimony aided in screening the discharged motorman.

New Michigan Road Opened.—The new line of the Michigan Railway between Kalamazoo and Grand Rapids has been placed in operation.

City of Des Moines Restrained.—United States District Judge Martin J. Wade at Des Moines, Ia., has overruled the motion of the city to dismiss the petition of the bondholders of the Des Moines City Railway for a restraining order preventing the city from tearing up the company's tracks on or after June 22, when it is held the franchise expires.

Drastic Action in London Strike.—The County Council of London, England, took a drastic step on May 22 to deal with the strike on the municipal tramway system. It ordered all employees of military age who are eligible for service in the army or navy to surrender their uniforms and badges. Only men above military age will be employed during the remainder of the war.

Illinois Proposes Home Rule.—The Illinois Senate committee on public utilities has reported out two alternative Chicago home-rule bills. One of the bills provides for control of public utilities by the city council and the other provides for the appointment of a commission by the mayor. Both bills will give home rule to all cities having a population of 5000 or more if they adopt a Chicago act.

New Secretary of National Railway Appliances Association.—Bruce V. Crandall, secretary of the National Railway Appliances Association since July 1, 1911, has resigned on account of the increased demand upon his time made by his own business. C. W. Kelly, treasurer and director of exhibits, has been elected secretary for Mr. Crandall's unexpired term, and all correspondence should be addressed to Mr. Kelly at 349 Peoples Gas Building, Chicago.

Action on New York Bills.—As noted elsewhere in this issue Governor Whitman has signed the Thompson jitney bill. He has disapproved the act to amend the public service commissions law, in relation to the approval of transfer of capital stock; the act to amend the stock corporation law in relation to the organization tax payable under sec. 108 of the tax law by any corporation issuing shares of stock without designated monetary value; to amend the workmen's compensation law, in relation to the distribution of copies of such law in three languages; to amend the highway law so as to permit the laying of railroad tracks on the Albany Post Road within Westchester County.

Labor's Demands.—Representatives of organized labor have formulated a long list of demands for constitutional amendments in the interest of labor to be submitted to the committee on industrial relations of the Constitutional Convention of New York. Among the things desired are an absolute prohibition against establishing military rule until conditions shall have rendered the sitting of courts of justice impracticable, provision against the creation of a State constabulary, a section defining the rights of labor substantially in accord with the spirit of the Clayton law and that it be made incumbent upon the Legislature to provide for the inauguration of an old-age insurance system and insurance against unemployment.

Massachusetts Legislature.—Governor Walsh has signed a bill which enables the Boston Elevated Railway's bonds to become legal investment for savings banks. The act is

general, applying to any street railway company, which, because of emergency, has been compelled to reduce its dividend, but which, in the succeeding two years, has restored the dividend to the previous 5 per cent rate. The prospects for jitney legislation are dead for the present session. Senator Gordon of Springfield attempted to introduce a new bill Monday providing an amendment to the present hackney law allowing cities to regulate the use of vehicles in the streets and licensing such of them as is deemed necessary. On account of the lateness of the session the committee on rules refused to admit the measure.

New York Industrial Commission Created.—The Whitman administration plan for the reorganization of the labor department and the workmen's compensation commission was consummated on May 24, when the Governor appointed the members of the industrial commission, which supersedes the two other departments. The Governor signed the industrial commission bill on Saturday. John Mitchell, former president of the United Mine Workers and now a member of the workmen's compensation commission, was made chairman of the industrial commission. James M. Lynch, at present labor commissioner and prominent in labor circles, was appointed to the second place on the commission. The remaining three places went to William H. H. Rogers, Rochester; Louis Wiard, Batavia, and Edward P. Lyon, Brooklyn.

The Pan-American Financial Conference.—The Pan-American Financial Conference, inspired by Secretary McAdoo of the Treasury Department, and for the expense of which Congress appropriated \$50,000, was begun at Washington on May 24. President Wilson personally opened the sessions in the Pan-American Union Building at the Capitol. Delegates from eighteen other American republics were in attendance. Attempting to solve some of the financial and commercial problems which have been brought to the American republics as a consequence of the European war, the distinguished foreign visitors have been in session in Washington for a week, and have now started upon a tour of some of the Eastern cities of the United States, as the guests of the government. About 100 American business men identified with the most important industries of the country attended at the invitation of Secretary McAdoo.

PROGRAM OF ASSOCIATION MEETING

Central Electric Railway Association

The complete program has been announced for the summer meeting of the Central Electric Railway Association, which is to be held on the *S. S. City of Erie* on June 17 and 18. The meeting of the executive committee will be held on June 17. June 18 will be given over to the outing and other pleasures. The program of papers announced for June 17 follows:

"Railway Motor Gearing," by W. L. Allen, commercial engineer of the R. D. Nuttall Company, Pittsburgh, Pa.

"Track Joining and Bonding," by E. C. Price, vice-president and secretary of the Indianapolis Switch & Frog Company, Springfield, Ohio.

"The Human Element in Electric Railway Operation," by H. C. De Camp, Westinghouse Electric & Manufacturing Company at Cincinnati.

"The Engineer in the Service of the Public, or Engineering in a Broader Aspect," by Prof. M. E. Cooley, dean of the engineering department, University of Michigan.

The *City of Erie* will leave the steamship company's new pier, at the foot of Ninth Street, Cleveland, at 9 a. m., Central Standard time, June 17, 1915. It will cruise among the islands and along the northern part of the lake during the day and night, reaching Buffalo Friday morning, June 18. The International Railway and the Niagara Gorge Route have asked the members of the association to be their guests on a trip from Buffalo to Niagara Falls, where a visit to the Falls will be made, including a trip around the widely celebrated Gorge Route. Luncheon will be served en route and the party will return to the ship at Buffalo during the afternoon. The ship will then cruise back through the evening and night, reaching the pier at Cleveland Saturday morning about 9 o'clock. Tickets for the round trip on the ship, including meals and berth for two days, will cost \$15. They may be secured of L. G. Parker, 6917 Bessemer Avenue, Cleveland, Ohio.

Financial and Corporate

ANNUAL REPORTS

Omaha & Council Bluffs Street Railway

The statement of income, profit and loss of the Omaha & Council Bluffs Street Railway, Omaha, Neb., for the year ended Dec. 31, 1914, follows:

Revenue from transportation:	
Passenger revenue	\$2,787,425
Special car revenue	2,402
Mail revenue	24,406
Transportation of mail carriers	8,396
Miscellaneous revenue	324
Total revenue from transportation	\$2,822,953
Revenue from operations other than transportation	143,260
Gross earnings from operation	\$2,966,213
Operating expenses	1,608,231
Net earnings from operation	\$1,357,982
Miscellaneous income	7,214
Gross income less operating expenses	\$1,365,196
Deductions from income:	
Taxes	\$233,126
Interest on funded debt	473,049
Interest on funded debt of leased lines	90,400
Rent of leased lines	60,000
Miscellaneous interest	300
Total	\$856,875
Net income	\$508,321
Dividends	450,000
Surplus for the year	\$58,321
Surplus Jan. 1, 1914	139,303
Credited to surplus during the year	12,688
Total	\$210,312
Charged to surplus during the year	37,981
Surplus Dec. 31, 1914	\$172,331

The gross earnings in 1914 compared with those of the preceding year showed a decrease of \$30,417 or 1.02 per cent. The operating expenses increased \$35,809 or 2.28 per cent. The balance in the reserve for depreciation as of Jan. 1, 1915, was \$1,097,849. An amount of \$72,627 was charged to this account during 1914 for rebuilding track and making other replacements. During the year \$182,858 was expended for betterments, additions and extensions. A sum of \$15,035 was expended for betterments on leased lines. On May 1, 1914, the underlying bonds of the Omaha Street Railway amounting to \$2,500,000 were paid.

Cleveland, Southwestern & Columbus Railway

The statement of income, profit and loss of the Cleveland Southwestern & Columbus Railway, Cleveland, Ohio, for the twelve months ended Dec. 31, 1914, follows:

Gross earnings:	
Revenue from transportation	\$1,175,170
Revenue from operation other than transportation	80,113
Total	\$1,255,283
Operating expenses and taxes:	
Operating expenses	\$757,021
Taxes	58,778
Total operating expenses and taxes	\$815,799
Net earnings from operation	\$439,484
Other income	168
Gross income	\$439,652
Deductions from income	328,114
Net income	\$111,538
Profit and loss surplus at beginning of year	366,040
Profit and loss surplus—Dec. 31, 1914	\$477,578

On account of the general business depression the gross revenue of the company did not equal the amount anticipated, but owing to the fact that a new passenger tariff was established effective Jan. 1, 1914, raising the rate of fare in many instances, the company was able to exceed by \$48 the gross revenue of 1913, although 200,000 less paid passengers were carried. The passenger revenue during the year increased \$5,043; milk revenue, \$1,739; freight revenue, \$1,239, and rental of track and facilities, \$2,449. Decreases in earnings were experienced in the case of parlor and special car revenue, \$2,779; express revenue, \$2,156; power revenue, \$4,663, and other smaller items.

The total operating expenses during 1914 showed a decrease of \$2,366. This was caused almost entirely by a decrease in power plant operation of \$27,519, other expense items showing the following increases: maintenance of way and structures, \$10,030; maintenance of car and shop equipment, \$2,911; maintenance of power plant equipment, \$1,131; conducting transportation, \$2,830; general and miscellaneous, \$5,889, and electric package operation, \$2,433. The maintenance expenditures covered the rebuilding of approximately 14 miles of high-tension pole line, the replacing of 300 defective poles and the installation of approximately 40,000 ties. The maintenance charges also included an item of \$7,920 for depreciation on equipment. Taxes increased \$2,257 during the year. The operating ratio was 60.31 per cent in 1914 as compared to 60.5 per cent in 1913, while the ratio of operating expenses and taxes to gross revenues was 64.99 per cent in 1914 as compared to 65 per cent in 1913.

The total expenditures for additions and improvements for the year were \$109,634, including \$41,065 for lighting lines, \$30,690 for rolling stock, \$19,983 for power plant and \$17,967 for track and roadway. The following table presents the most important operating statistics for 1914 and 1913:

	1914	1913
Passenger car-miles	3,418,707	3,418,197
Express and freight car-miles	400,614	386,452
Service car-miles	122,825	96,272
Paid passengers	6,942,908	7,152,821
Pass passengers	39,213	38,506
Employees	292,544	297,217
Transfers	394,185	376,762
Gross earnings per car-mile, in cents	31.84	32.17
Operating expenses and taxes, per car mile, in cents	20.69	20.91
Earnings per mile of track	\$6,006	\$6,005
Operating expenses per mile of track	\$3,622	\$3,633

Washington, Baltimore & Annapolis Electric Railroad

The latest annual report of the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., shows that the railway operating revenues for 1914 were \$816,938, as compared to \$831,940 in 1913, a decrease of \$15,001 or 1.8 per cent. In 1914 the operating expenses totaled \$449,626 as compared to \$423,626 in 1913, an increase of \$26,000 or 6.1 per cent. The net revenue from railway operations in the two years was \$367,313 and \$408,314 respectively, a decrease for 1914 of \$41,001 or 10 per cent.

The report states that although the railway operating revenues decreased \$15,001 during 1914, the general business really increased about that amount. In March, 1913, the earnings from passenger traffic resulting from the Presidential inauguration exceeded \$30,000, for which there was no corresponding item in 1914. The increased expenses for 1914 were caused by an advance in wages of trainmen and other employees, by charges to depreciation on equipment, and by additional expenditures necessary to preserve the company's standard of maintenance.

The net revenue from auxiliary operation increased from \$3,835 in 1913 to \$14,925 in 1914, this increase being caused by the sale of power to the Annapolis Public Utilities Company. Taxes assignable to railway operation showed a slight increase for 1914, but the non-operating income increased from \$7,061 in 1913 to \$13,071 in 1914 on account of dividends on stock of the Annapolis Public Utilities Company. The gross income in 1914 amounted to \$357,495 as compared to \$381,823 in 1913, a decrease of \$24,328 or 6.3 per cent. On account of a small increase in deductions caused by increased bond interest, the net income decreased from \$129,620 in 1913 to \$101,728 in 1914, an amount of \$27,892 or 21 per cent.

American Power & Light Company, New York, N. Y.—The latest report of the American Power & Light Company states that all its operating subsidiaries made substantial progress during the calendar year 1914. The increase in the combined gross earnings was 13 per cent and in the net earnings 16 per cent. The total gross earnings were \$6,615,994, of which 58 per cent was from electric light and power, 28 per cent from artificial gas, 8 per cent for natural gas, 3 per cent from electric railways and 3 per cent

from water business. In the case of the Pacific Power & Light Company, which operates the street railways in Astoria, and through the Walla Walla Valley Railway operates the street railways in Walla Walla and the interurban line between Walla Walla and Milton, 12 per cent of the total gross earnings was derived from electric railway operation. The Southwestern Power & Light Company, which controls the Paris (Tex.) Transit Company, secured 2 per cent of its gross earnings from its electric railway. The combined surplus balance accruing to the American Power & Light Company as of Dec. 31, 1914, was \$1,325,162.

Augusta-Aiken Railway & Electric Corporation, Augusta, Ga.—The directors of the Augusta-Aiken Railway & Electric Corporation have decided to increase the authorized 6 per cent cumulative preferred stock from \$1,500,000 to \$2,250,000, the \$750,000 of new stock to be on a parity with the present issue. The accrual of dividends on the new preferred stock will be only from Oct. 1, 1915. A special meeting of stockholders has been called for June 23 to authorize the foregoing. Stockholders of record June 1 will be offered the right to subscribe on or before June 15 for the new preferred stock at par, in an amount not exceeding one-fifth of the shares held.

Barcelona Traction, Light & Power Company, Barcelona, Spain.—The London holders of the first mortgage 5 per cent bonds of the Barcelona Traction, Light & Power Company on May 11 approved the proposed readjustment plan described in the *ELECTRIC RAILWAY JOURNAL* of Feb. 27 and May 1. An additional meeting will be necessary in June, however, for insufficient notice was given to French and Belgian bondholders.

Berlin (Germany) Elevated-Subway System.—The Berlin Elevated-Subway System (Berlin Hoch- und Untergrundbahn) in its annual report for 1914 presents an interesting table which shows the marked falling off each month in operating revenue and number of passengers carried after the mobilization in August, 1914. Owing to the great amount of traffic prior to the outbreak of the war, however, the total operating revenue for 1914 was 10,104,404 marks (\$2,425,057) as compared to 9,383,248 marks (\$2,241,989) in 1913. The total number of passengers carried in 1914 was 77,027,513 as compared to 71,525,370 in 1913. At the time of the mobilization the greater part of the employees were summoned to enlist, but it was possible to find enough substitutes to maintain operation for the decreased traffic. The average revenue per passenger in 1914 amounted to 13.12 pfennige, or 3.28 cents, as in the preceding year. The company operated in 1914 4,352,265 train-km. (2,704,497 train-miles) with six-car trains. It owned at the end of the year 400 cars, including 226 motor cars and 174 trailers. During the year the construction of a short connecting line from Gleisdreieck to the Wittenbergplatz was begun. When this connection is finished it will enable a through routing of the Schöneberger trains over the eastern lines. The company opened up three profitable auto-bus lines. These, however, were discontinued at the outbreak of the war when the buses were commandeered for the army.

Chambersburg & Gettysburg Electric Railway, Chambersburg, Pa.—H. B. McNulty, Chambersburg, Pa., is reported to have secured options on a number of public service properties in Waynesboro, Chambersburg, Shippensburg and Greencastle in the interest of a syndicate which it is said contemplates merging the properties. Among the companies mentioned as being included in the proposal are the Shippensburg Gas & Electric Company, Chambersburg Gas Company, Chambersburg & Gettysburg Electric Railway, Chambersburg & Shippensburg Railway, Chambersburg, Greencastle & Waynesboro Street Railway, Greencastle Electric Company, Waynesboro Electric Company, Waynesboro Gas Company, and Mercersburg Turnpike Company.

Columbus Railway, Power & Light Company, Columbus, Ohio.—The Ohio Public Utilities Commission recently authorized the Columbus Railway, Power & Light Company to issue \$1,739,000 of first refunding and extension sinking fund mortgage 5 per cent bonds at not less than 80, but refused to permit their hypothecation for less than 80 pending their sale. The company asked to issue \$1,800,000

of bonds and to use them as collateral at 66 2/3. The proceeds of \$1,189,000 of bonds are to be used in payment for additions, extensions and improvements made between Nov. 1, 1913, and March 31, 1915, which cost \$951,244. The proceeds of \$300,000 are to be used to enlarge the working capital, and of the remaining \$250,000, to pay part of the cost of the company's improvement programme for 1915. The statement of the company filed with the commission showed that \$431,220 had been authorized for this purpose.

Denver (Col.) City Tramways.—Commissioner of Finance Clair J. Pitcher filed suit in the District Court on May 24, asking that a receiver be appointed for the Denver City Tramways. The action does not arise from any financial trouble, but from the dispute incidentally over the payment of taxes and fundamentally over the question of jurisdiction between the city and the State. The utility valuation and tax levies were made by the city authorities and they refused to recognize the authority of the State taxing board in revising them. The utilities went into court on the question of jurisdiction and the Denver Gas & Electric Light Company made tender, under protest, of its taxes. This the city refused to accept and the entire matter is now being threshed out in the courts.

Dominion Traction & Lighting Company, Ltd., Windsor, Ont.—The Canadian Dominion Traction & Lighting Company recently filed a certificate showing a decrease in common stock from \$10,000,000 to \$8,000,000. The authorized issue remains \$2,500,000. This company controls the Windsor, Essex & Lake Shore Rapid Railway.

East St. Louis & Suburban Company, East St. Louis, Ill.—Whitaker & Company, St. Louis, Mo., are offering \$20,000 of 5 per cent first mortgage bonds of the East St. Louis & Suburban Company, due on April 1, 1932, at a price to yield 6 per cent.

Idaho Railway, Light & Power Company, Boise, Idaho.—Special Master Markus will sell at public auction to the highest bidder on June 14, in conformity with the decree of the United States District Court, the property of the Idaho Railway, Light & Power Company. The court has fixed the minimum upset price at \$4,542,750, and the master will receive no bid unless accompanied by a certified check for \$50,000.

Massachusetts Electric Companies, Boston, Mass.—The Massachusetts Electric Companies has passed the semi-annual dividend of 2 per cent on its preferred stock, due under normal conditions in July.

National Properties Company, New York, N. Y.—The National Properties Company has taken over the management of the Jersey Central Traction Company, which was recently purchased by Laird Brothers, Wilmington, Del., as noted in the *ELECTRIC RAILWAY JOURNAL* of April 30. The property was formerly owned by Morris Brothers & Company, Philadelphia.

New York (N. Y.) Railways.—The United States Supreme Court recently denied the petition of the city for a writ of certiorari to review lower decisions which had confirmed a report by the special master denying preference to claims against the Metropolitan Street Railway and the New York City Railway for money spent in paving between car tracks and 2 ft. outside. The court also refused to review decisions granting the tort creditors' committee equal treatment with the railways' supply houses.

New York Central & Hudson River Railroad, New York, N. Y.—During the calendar year 1914 the New York Central & Hudson River Railroad expended \$116,128 for the electrification of its lines from Mott Haven to Croton. It also expended \$1,444,832 for the four-tracking and the electrification of the New York & Harlem Railroad from New York to North White Plains, and for other general improvements. Six electric locomotives were put in service, costing \$454,675. The company now has sixty-three electric locomotives, 174 electric motor passenger coaches, twelve electric motor combination passenger cars and six electric motor mail, express and baggage cars. Under a consolidation agreement ratified on Dec. 22, 1914, this company with others is now included in a new corporation, the New York Central Railroad.

Ohio Traction Company, Cincinnati, Ohio.—The Ohio Supreme Court in a recent decision reversing a lower court

held that the Ohio Traction Company is not liable for an excise tax of 1.2 per cent on earnings from securities of subsidiary companies, this tax under the original act applying only to earnings from operation. Under the amended act of 1911, however, the company is liable for a tax upon earnings from other sources than investments, such as building rentals.

Pacific Gas & Electric Company, San Francisco, Cal.—The Pacific Gas & Electric Company on May 22 paid off in cash \$1,500,000 of its 5 per cent. one-year notes not due until Dec. 15. This clears up the entire floating debt. The original issue of the notes amounted to \$4,000,000, two previous payments having been made in March and April. An official states that the early payment of notes has been due to the steadily strengthening financial position of the company. Its gross income has grown from \$11,342,140 in 1907 to \$17,220,504 in 1914, an increase of \$5,878,364 or about 52 per cent, and the net income has gained correspondingly. One unique feature is that the company, notwithstanding its size, is the owner in absolute fee of all the properties it operates.

Portland Railway, Light & Power Company, Portland, Ore.—The stockholders of the Portland Railway, Light & Power Company on May 14 voted to put into operation the capital readjustment described in the *ELECTRIC RAILWAY JOURNAL* of May 1. The \$1,250,000 of cash to be raised thereby will be used for current needs.

San Diego (Cal.) Electric Railway.—The California Railroad Commission finds that the reproduction cost of the operative property of the San Diego Electric Railway, as of June 30, 1914, is \$4,736,149, and that the reproduction cost less depreciation, as of the same date, amounts to \$4,481,160.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—Interest due on May 19 on \$1,587,000 of general consolidated mortgage 5 per cent bonds of the San Francisco, Oakland & San José Consolidated Railway was paid at maturity. John S. Drum, secretary of the F. M. Smith advisory committee, states that the complete financial reorganization of the railways is believed to be necessary. All the engineering and accounting data and other information necessary have been collected, but no plan will be determined upon until the California Railroad Commission acts on the company's application for an authorized valuation. When this valuation is received, a reorganization committee will begin work at once. Inasmuch as all the preliminary valuations give a sum in excess of the note and bond issues at par, bondholders are advised not to dispose of their securities at the present market prices. Under a recent decision the California Railroad Commission has authorized the San Francisco-Oakland Terminal Railways to execute a 6 per cent promissory note of \$27,000, payable to the Central National Bank, Oakland. This note represents the balance due on a note of \$65,000 made by the Oakland Traction Company on March 21, 1912.

Syracuse & South Bay Electric Railroad, Syracuse, N. Y.—Ernest Gonzenbach has been appointed receiver for both the Syracuse & South Bay Electric Railroad and the Syracuse, Watertown & St. Lawrence River Railroad. These two companies are financially distinct organizations but are operated under one management. The former operates from Syracuse to South Bay and Oneida Lake, with a double-track line and very heavy construction. It has \$300,000 of preferred stock and \$700,000 of common stock and a total bonded indebtedness of \$550,000. The latter is a separate five-mile branch running as far as Brewerton, although it was originally intended to operate as far as Watertown and the Thousand Island resorts. This company has \$40,000 of capital stock and a first mortgage bond issue of \$200,000. The plan of reorganization contemplates a consolidation of these properties and the issuance of new preferred and common stock and a first mortgage of \$375,000 covering the two properties. The majority of present security holders have agreed to the plan and deposited their securities. A reorganization committee has been appointed, consisting of W. L. Smith and William Nottingham, Syracuse, and F. W. Roebing, Jr., Trenton. E. I. Edgcomb, Syracuse, and W. O. Morgan, New York, have been designated as the attorneys for the committee.

DIVIDENDS DECLARED

Baton Rouge (La.) Electric Company, 3 per cent, preferred.

El Paso (Tex.) Electric Company, quarterly, 2¼ per cent, common.

Norfolk Railway & Light Company, Norfolk, Va., 3 per cent.

Northern Ohio Traction & Light Company, quarterly, 1¼ per cent, common.

Rochester Railway & Light Company, Rochester, N. Y., quarterly, 1¼ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

ATLANTIC SHORE RAILWAY, KENNEBUNK, MAINE

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '15	\$23,855	*\$23,303	\$552
1 " " '14	25,154	*22,469	2,685

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

1m., Mar., '15	\$7,006	*\$6,854	\$153	\$1,136	†\$984
1 " " '14	6,880	*7,549	†669	1,074	†1,743
12 " " '15	122,453	*101,311	21,141	13,345	7,796
12 " " '14	121,671	*99,787	21,884	12,972	8,912

CAPE BRETON (N. S.) ELECTRIC COMPANY, LTD.

1m., Mar., '15	\$23,496	*\$15,666	\$7,830	\$6,543	\$1,287
1 " " '14	26,511	*16,358	10,193	6,439	2,753
12 " " '15	344,249	*209,008	135,240	78,123	57,117
12 " " '14	376,509	*209,840	166,669	74,215	92,454

COLUMBUS (GA.) ELECTRIC COMPANY

1m., Mar., '15	\$55,583	*\$26,186	\$29,397	\$28,791	\$606
1 " " '14	53,465	*24,702	28,763	24,814	3,949
12 " " '15	690,773	*307,168	383,605	336,079	47,527
12 " " '14	628,005	*285,033	342,973	287,775	†69,680

DALLAS (TEX.) ELECTRIC COMPANY

1m., Mar., '15	\$144,816	*\$89,420	\$55,396	\$33,429	\$21,967
1 " " '14	188,287	*117,778	70,510	26,867	43,643
12 " " '15	2,110,020	*1,204,412	905,608	390,934	514,674
12 " " '14	2,257,058	*1,332,209	924,849	309,363	615,486

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.					
1m., Mar., '15	\$52,189	*\$31,983	\$20,206	\$8,772	\$11,434
1 " " '14	51,191	*32,527	18,664	8,250	10,414
12 " " '15	670,976	*391,986	278,990	103,352	175,638
12 " " '14	516,014	*327,655	188,359	84,763	†135,132

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

1m., Mar., '15	\$198,612	*\$120,944	\$77,668	\$64,663	\$13,005
1 " " '14	227,929	*142,438	85,491	56,255	29,236
12 " " '15	2,522,109	*1,543,449	1,008,660	732,515	276,145
12 " " '14	2,736,341	*1,675,519	1,060,822	600,227	460,595

FT. WAYNE & NORTHERN INDIANA TRACTION COMPANY, FORT WAYNE, IND.

1m., Mar., '15	\$138,953	\$80,696	\$58,257	\$54,527	†\$4,139
1 " " '14	149,452	88,655	60,797	52,369	†8,557
3 " " '15	430,341	243,765	186,576	160,613	†26,999
3 " " '14	460,431	260,539	199,892	152,862	†47,825

KENTUCKY TRACTION & TERMINAL COMPANY, LEXINGTON, KY.

1m., Mar., '15	\$58,708	\$33,184	\$25,524	\$19,725	†\$9,565
1 " " '14	58,527	33,193	25,334	20,731	†8,890
9 " " '15	608,579	325,154	283,425	177,995	†129,498
9 " " '14	576,632	303,249	273,383	184,143	†112,329

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

1m., Mar., '15	\$128,701	*\$85,327	\$43,374	\$27,254	\$16,120
1 " " '14	177,956	*101,663	76,293	25,883	50,410
12 " " '15	1,958,748	*1,096,333	862,415	323,776	538,639
12 " " '14	2,152,499	*1,200,752	951,747	287,928	663,819

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

1m., Mar., '15	\$615,210	*\$401,582	\$213,628	\$181,241	\$32,387
1 " " '14	713,650	*436,860	276,790	175,251	101,539
12 " " '15	8,169,612	*4,938,420	3,231,192	2,135,049	1,096,143
12 " " '14	8,713,435	*5,015,023	3,698,411	2,084,765	1,613,646

TAMPA (FLA.) ELECTRIC COMPANY

1m., Mar., '15	\$82,268	*\$42,007	\$40,261	\$4,376	\$35,885
1 " " '14	79,143	*43,960	35,183	4,514	30,669
12 " " '15	991,860	*512,744	479,116	53,066	426,050
12 " " '14	888,407	*494,377	394,039	55,948	338,081

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., Apr., '15	\$762,240	\$490,149	\$272,090	\$132,666	†\$141,613
1 " " '14	743,327	464,391	278,936	129,397	†149,790
4 " " '15	3,031,992	2,045,274	986,717	531,065	†466,007
4 " " '14	2,916,747	1,916,468	1,000,278	517,204	†486,932

VIRGINIA RAILWAY & POWER COMPANY, RICHMOND, VA.

1m., Mar., '15	\$399,491	\$202,889	\$196,602	\$138,038	†\$65,021
1 " " '14	415,399	196,787	218,612	134,542	†89,666
9 " " '15	3,860,783	1,858,866	2,001,917	1,225,584	†836,154
9 " " '14	3,863,509	1,855,977	2,007,533	1,208,990	†863,061

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

THE JITNEY BUS

New York State Bill Signed—Jitney Made a Commission Issue in Illinois

In the jitney news this week the action of Governor Whitman of New York in signing the jitney bill stands out among the other events like Mars at perihelium. This measure, the provisions of which had been referred to previously in the *ELECTRIC RAILWAY JOURNAL*, provides in brief that no vehicles charging a fare of less than 15 cents shall be operated in any city until the owner has procured, after public notice and a hearing, the consent of the local authorities as defined by the railroad law and has executed and delivered a bond in an amount fixed by the local authorities. In short, the new law merely carries out the basic idea of the public service commissions law that while public utilities are regulated they will also be protected from improper competition.

In Pennsylvania the bill vesting the local authorities with the right to regulate jitneys in their particular districts has passed both Houses of the Legislature. It is regarded as likely that the Governor will sign the measure. The jitney bus regulation bill which was killed in Massachusetts, as noted last week, was originally introduced by the Massachusetts Street Railway Association and provided for heavy bonding and responsibility for accidents, besides placing the jitneys under the regulation of the Public Service Commission. It was later amended to permit local municipal authorities to license the jitneys and regulate the traffic. The opinion of the Attorney-General relative to the constitutionality of the bill being adverse, the House refused to put the measure through.

In Illinois the jitney has also, in a measure, been made a State issue. There the Jacksonville Railway & Light Company has carried its case against the jitney to the State Public Service Commission, which body has been asked to decide whether the jitney is a public utility. The hearing in this case will be held before the commission at Springfield on June 2. In Pennsylvania the members of the commission have refused to discuss the matter on account of the pending case from Tarentum. While the original Pennsylvania act did not contemplate the regulation of the jitneys, it is held by lawyers that if the commission so desired, it could regulate the business either under "common carrier" or "personal" clauses of the law. So far the only official notice that the Pennsylvania commission has taken of the jitneys is in granting certificates of public convenience to companies which applied for charters.

In Vancouver, B. C., a jitney bus ordinance has been passed to go into effect on June 1. Change making or fare collecting while the jitney is in motion is prohibited. Jitneys may not stop for taking on or letting off passengers except within 2 ft. of the curb and not nearer than 30 ft. from a street corner. A bond approved by the city must be filed with the City Council.

In the City of Portland, Ore., Commissioner Daly has requested City Attorney Lathrop to prepare a new ordinance to regulate the jitneys. The measure, which will embody all of the essentials of the ordinance passed on April 2, and held up by the referendum invoked by the jitney drivers, will be submitted to the voters at the June election. The course proposed is the only way to get the jitney question before the voters at the election next month, as the referendum invoked on the other measures holds the question up for two years.

Among additional cities in which the jitneys has gone out of business recently are Pueblo, Col., and Little Rock, Ark. The Pueblo *Chieftain* says that "the cars quit because there was not any money in the business." In an editorial that paper said in part: "Novelty had a good deal to do with the early success of the jitneys, and if they did not continue to get the patronage necessary to make them a success it was because they failed, in important ways, to meet the requirements for a successful city system of transportation." The drivers of more than forty jitneys, constituting virtually the sole motor transportation in Little Rock, suspended on May 13 following an order of the chief of police requiring that the operators of all cars not operating under a bond

of \$2,000 as fixed in the recent city ordinance be arrested.

In New Orleans the jitney owners have been notified that they will have until June 1 to file the bonds of \$5,000 for each car operated as provided in the ordinance enacted recently. This measure, so drawn as not to be discriminatory, will be complied with by the New Orleans Railway & Light Company filing with the city a bond of \$2,500,000 to cover 500 of its cars.

The revelations in St. Louis referred to in the *ELECTRIC RAILWAY JOURNAL* of May 22 are regarded as being largely responsible for the introduction of a regulatory measure in the Board of Aldermen of that city. This measure was presented by Alderman Koenig and should not be confused with the one upon which Director of Public Safety Talbert is understood to be at work. The Koenig measure fixes the bond at \$10,000. The license fee is placed at \$25 a year for a car carrying five passengers or less, \$35 a year for a car carrying six or seven passengers, and at \$5 a seat a year for cars carrying more than seven passengers. Cars must operate over a fixed route on a definite schedule. Penalties are fixed for violations of the provisions of the measure. The Team Owners Association of St. Louis is distributing a double page folder 8 in. wide by 12 in. high containing head lines from the local papers dealing principally with jitney accidents. The circular is headed: "The Irresponsible Jitney. The Irresponsible Driver." The sub-heads follow: "Auto Accidents Have Increased 72 per Cent Since the Auto-Bus Started," "Extortion, 'Mashing' and Assault Show the Need of Its Regulation."

The first trial on a charge of violating the provisions of the new Fort Worth jitney regulation ordinance resulted in a conviction in the Corporation Court of Fort Worth. The case was against R. L. Moore, who was charged with operating a jitney without a license. Mr. Moore's defence was that he did not operate a jitney bus. He had a contribution box in his automobile into which passengers could deposit any amount they desired, and he introduced witnesses who testified that they rode in his automobile several times but did not contribute anything. Mr. Moore immediately appealed the case to the County Court. He has since been arrested again on the same charge. Twenty-two other cases have not yet come to trial.

Application was recently filed with the City Commission of Fort Worth by the jitney union asking for a referendum election on the jitney ordinance. No action was taken and application was then made for a mandamus to compel the commission to order the referendum election. The city officials were cited to appear in court to show cause why the mandamus should not be issued. They advanced the argument that the ordinance in question was passed under the police power of the commission and was an emergency measure designed for the immediate preservation of the public peace, health and safety and was not subject to the referendum provision of the charter. The court took the matter under advisement.

ALBANY SERVICE HEARING

Before the Public Service Commission for the Second District of New York on May 25 the officers of the United Traction Company and the Delaware & Hudson Company began their argument to prove that the company is financially unable to carry out the provisions of the commission's recent order with regard to the purchase of new cars now and in the future. Due to the illness of W. H. Williams, vice-president of both companies and the man most familiar with their financial situation, it was necessary to adjourn the hearing after he had been on the stand but a short time. The matter will be further taken up on June 7 at noon.

Before the hearing was adjourned, however, Chairman Van Santvoord of the commission announced that the commission would order the immediate preparation of transfers to be used by passengers boarding the Schenectady cars eastbound within the city line of Albany. The company agreed to accept this order. C. F. Hewitt, general manager, announced that the transfers would be ordered immediately and that he would put them in service on or before June 25. Attorney Lewis E. Carr made it plain that the company in doing this did not agree to the principle of giving transfers to all passengers coming into Albany on the Schenectady cars. This is the subject of a separate proceeding now before the commission.

The company opened its case with a general discussion of the financial situation by L. F. Loree. Mr. Loree described the difficulty of obtaining funds at this time for even prosperous enterprises due to the European conflict and told of the increased rates which all borrowers were compelled to pay. Taking up the effect of the war upon the purchase of new cars Mr. Williams told the commission that it made the borrowing of money more difficult and that it reduced earnings. The reduction of revenues so far this year was such as to enforce the belief that the company would not be able to meet fixed charges at present carried. While taxes had increased 134 per cent on the United Traction properties since 1906, the increase in revenues had been only 25 per cent. Mr. Williams said that he could not at present make such a loan as the purchase of the new cars would require with any reasonable expectation of meeting the additional fixed charges which it would entail. Up to last year such charges might have been taken care of out of money paid in dividends. That was no longer possible. Mr. Williams submitted figures to show the falling off in revenue for the first four months of this year as compared with the same months of 1914. For the first twenty-one days in May, Mr. Williams testified that the receipts on the Albany division had been \$5,138 less than last year and \$5,707 less on the Troy division. This is a total falling off for the system of \$10,844 for these twenty-one days.

PUBLICITY IN FORT WORTH

Jitney Seized as an Opportunity to Establish Better Public Relations

The Northern Texas Traction Company, Fort Worth, Texas, has completed the publication over the signature of George H. Clifford, manager, of a set of fourteen advertisements dealing with the company, its progress and its future, which attracted unusual attention. The ads were all published under the main caption, "To the People of Ft. Worth." Sub-captions were not used in all cases. Those that were used follow: "Urban Transportation and City Building," "Electrifying Street Railways," "The Making of a Modern City," "Jitneys and Interurbans," "What the Jitneys Are Doing," "Pulling Down the Temple," "Who Gets the Profits?" "Is Sympathy Being Misplaced?" "Are We Playing the Iconoclast?" "Street Congestion and Accidents," "A Sense of Responsibility," "Traction Company as a Monopoly," "A Word in Summing Up."

The Northern Texas Traction Company was one of the few companies that seized upon the jitney as a means to establish better public relations. In the advertisements referred to it told its story and told it frankly. The case of the company, well put, was received by the public cordially. There was no adverse comment whatever. In fact, many citizens wrote, telephoned or called upon the company to ask how they could help. It is proposed now to bind the ads for general distribution.

In its initial advertisement the company stated its purpose as follows: "The Northern Texas Traction Company is, from day to day, going to lay the facts of the case before those people whose destiny is linked with its destiny, and leave it to them to determine if they want to destroy or seriously impair this agency which is essential to the physical development, prosperity, and growth of the city." In concluding the series the company said in part:

"The cry of the jitney that if it is compelled to perform the proper functions of a common carrier it will be forced out of business, is an admission of the charge we have proved that it is absolutely incapable of performing those functions. If it could take the place of the traction company, and survive, it would do so. If it cannot carry its share of burdens and responsibility to the citizenship, why should it be tolerated, and permitted to destroy an agency which meets all its obligations, and is an aid in city building?"

"If the jitney could care for all the people all the time, meet all the requirements of a transportation company, and aid in the upbuilding of the city, the traction company would not lift a hand to hinder.

"But the Northern Texas Traction Company does not believe it would be a good citizen of this town if it did not place its knowledge of this situation before the people, or

ask them to decide if they want to destroy it, and depend upon a nondescript lot of irresponsible automobiles which have neither the capacity nor the stability to perform the functions which are necessary to the future development of the city.

"Confession that the jitneys cannot discharge these obligations is also confession that they are incapable of rendering the service necessary. Yet serious injury is being done to the traction company by numerous operators entering the service only to find they cannot make a profit. Others are permitted to engage in the business only to meet the same fate. Will this condition be permitted to exist and thereby destroy one of Fort Worth's best citizens?"

"In our series of articles we have met this issue fairly, frankly, fearlessly and truthfully in an appeal for fair play and in defense of any reduction or crippling of our service, which will of necessity result if present conditions continue.

"We therefore rest our case and await your decision."

One-Man Cars in Tucson.—The Corporation Commission of Arizona has sanctioned the use of one-man cars on the lines of the Tucson Rapid Transit Company.

Memphis Transfer Case.—The Court of Civil Appeals of Tennessee held recently that the Memphis Street Railway was not obliged to issue transfers upon its tickets sold at the rate of eleven for 50 cents. The city has taken an appeal to the State Supreme Court.

Wilkes-Barre Wage Testimony All In.—Testimony in the wage dispute between the officials and employees of the Wilkes-Barre (Pa.) Railway, being heard before a board of three arbitrators, has been brought to a close and the arbitrators fixed June 19 as a date for final argument. The board ruled, however, that written testimony may be submitted to the arbitrators at any time up to June 19.

Experiment in Albany with Stepless Car.—The United Traction Company, Albany, N. Y., will place in service on its Albany lines a low-level, stepless car for the purpose of ascertaining its general fitness for operation under the severe service conditions existing in that city. The car is one borrowed by the company from the Third Avenue Railway, New York. The well-known "pay-within" features, and the latest type of motors, trucks and other details of equipment are embodied in its construction.

Cedar Valley Road Time-Table.—The Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., known as the Cedar Valley Road, has issued a very attractive time-table in booklet form 3¼ in. wide by 5½ in. high. In addition to the time-tables, there is at the top of practically every page a halftone reproduction of the equipment of the company or some point of interest along the line concerned with the company's business. A double page map, 6 in. wide by 5 in. high, shows the route of the road and all the connecting lines.

For Editors of Company Publications.—Under "Carried Out Orders," Edward K. Lynch has the following in his column in the May issue of the *New York Railways Employees' Magazine*, edited by H. P. Waugh: "Mr. Waugh, the editor of the *Magazine*, wheeled his chair around and pushed a button on his desk. The person wanted entered. 'Here,' said Editor Waugh, 'are a number of directions from outsiders as to the best way to run the *Magazine*. See that they are all carried out.' And the office boy, gathering them all into a large waste basket, did so."

New Brooklyn Advertising Company.—The Brooklyn (N. Y.) Rapid Transit Company has organized and started in operation the company through which it will handle all its car advertising, news-stands and other privileges under the name of the Broadway Subway & Home Borough Car Advertising Company, Inc. The new company's office will be at No. 31 Nassau Street, New York. The chairman of the board is Nicholas F. Brady, the president Joseph P. Day and the secretary Lewis C. Sanford. The company, instead of leasing all its news-stands to one large corporation, intends to conduct the stands itself.

New York Health Board Rebuffed.—Theodore P. Shonts, president of the New York (N. Y.) Railway, has declined to accept the request of Dr. S. S. Goldwater, health commissioner of New York, asking the company to consent to the department taking charge of the dispatching of the cars

on the Sixth Avenue line. Mr. Shonts says that it is difficult for him to imagine that any railroad would turn over the management of its property, even temporarily, to any person who could not assume the responsibility that goes with railroad operation. Dr. Goldwater thinks that Mr. Shonts missed an opportunity which he may never have again.

The Augusta-Aiken Fare Increase.—The Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., has filed notice with the Railroad Commission of South Carolina that it will put into effect on June 1 the advance in fares authorized by the commission last December. Commutation rates remain unchanged, but the single fare from Augusta to Aiken will be 40 cents instead of 25 cents; to Belvedere, 10 cents instead of 5 cents, as at present; to North Augusta, though, the fare will remain the same, 5 cents. The company is preparing to meet the suggestions of the commission with respect to separate compartments for whites and for blacks and relating to the providing of toilet facilities on the interurban cars.

The Queens County Service Case.—The New York & Queens County Railway, Long Island City, N. Y., has notified the Public Service Commission for the First District that it cannot accept the order of the commission, adopted after rehearing, requiring certain additions to the service of the company. The company's letter states that it would have to purchase forty-three or fifty-five additional cars and increase its power plant at a large expenditure in order to carry out the terms of the order. The company says that it is not in financial condition to bear this expense, and therefore asks for a rehearing. The commission decided to give the company an opportunity to present evidence as to its financial condition at a hearing which was set to be held on May 27.

The Cheapest Car Ride in the World.—Electric railways concerned about low fares may find comfort in the plight of the El Paso (Tex.) Electric Railway, which operates one of its lines into Juarez, now dominated by the Villaistas. Real money in this part of Mexico has been replaced by a variety of "shinplasters" liberal in color and engraving, but worth just now about 4 cents on the dollar in Uncle Sam's specie. Unfortunately, the franchise of the El Paso Electric Railway calls for a fare of 10 cents Mexican. At the current rate of exchange, therefore, the Mexican passenger is enjoying his ride at 0.4 cent per trip. Tickets and Mexican fares are collected by means of registers, while a cash box handles all real money. Like the character in Ibsen's "Peer Gynt," there's nothing to do but wait hopefully for better days to come.

Houston Electric Advertising.—The Houston (Tex.) Electric Company is carrying in the daily papers of Houston a series of very effective advertisements designed to acquaint the public better with the work which the company has done in the interest of the city. In a recent advertisement headed "Pulling Down the Temple" the company stated frankly that the jitneys were handling one-third of the traffic in Houston, which meant a loss in revenue to the company of \$30,000 a month. The company concluded the advertisement as follows: "The study of the jitney service has developed the opinion that it is the result of the lack of work. Perhaps it is true that men are willing to drive jitneys for what they can make to tide them over. If you look the facts squarely in the face, you need not be a prophet to read the future."

Detroit Freight Contract.—The Detroit (Mich.) United Railway freight department reports closing a contract to handle 18,000 tons of sand, gravel and cement from the Grand Trunk Railway System connection between Birmingham and Royal Oak, Mich., a distance of approximately 5 miles. This material will be set on team trucks and will be used in constructing good roads. The freight department of this road has also just closed a contract to transport 25,000 automobile touring bodies between Detroit and Flint, Mich. These shipments will include sedan and couplet bodies manufactured by the Fisher Body Company, Detroit, and will be delivered to the Buick Motor Car Company, at Flint, Mich. The total haul will be approximately 68 miles, and it will take four months to handle the 1050 cars required for this contract.

Retaliation at Increase in Fare.—The board of commissioners of Wayne County (Ind.) filed suit May 15 to enjoin the Terre Haute, Indianapolis & Eastern Traction Company from further use through Wayne County of the National Road as a right-of-way. The action is the outgrowth of the new passenger tariff schedule which went into effect on May 1, and which makes the uniform rate of 2 cents a mile in accordance with the State law, while the franchise under which the company operates in Wayne County sets the maximum at 12/3 cents. The company contends that a franchise provision as to the rate of fare is not binding in the face of the order of the Public Service Commission granting the increase. The county, it is stated, will admit this, but will contend that the section giving the company the free use of the National Road can be revoked under the terms of the franchise agreement as a result of the increased fare. In other words, the county takes the position that the company has the power to charge the increased rate, but that it cannot charge the increased rate and operate over the National Road. The county will insist that the company purchase its own right-of-way and remove its tracks from the highway.

Serious Steam-Electric Collision.—A Santa Fé Railroad locomotive crashed into a Pacific Electric Railway passenger coach on May 7 at the Aliso Street crossing in Los Angeles, Cal., completely wrecking the car, killing five passengers outright and injuring thirty others. At a meeting of the Los Angeles Board of Public Utilities, held to fix upon a means of preventing a recurrence of the tragedy, new regulations governing steam-electric crossings were adopted to go into effect at once. These provide that all street and interurban cars must come to a full stop at least 10 ft. from a railroad crossing and proceed only after receiving a clear signal from a human flagman at the crossing. If no flagman is stationed at the crossing, one of the train crew must go to the far side of crossing before signaling to go ahead. Railroad trains must not exceed 8 m.p.h. within the city over any interstate or interurban railroad crossing. All Pacific Electric cars are to have right-of-way over steam railroad trains at the San Pedro, Los Angeles & Salt Lake crossing on the east side of the river and at the Santa Fé Railroad crossing on the west side of the river, where the recent accident occurred. The City Council also adopted a measure providing for the construction of a viaduct in East Seventh Street over the railroad tracks, and the expense of which is to be borne jointly by the Santa Fé and the Salt Lake railroads and the Los Angeles Railway, with the property owners assessed their proportionate share of the expense, and the city and county aiding.

Peninsula Rate Decision.—The Railroad Commission of California has dismissed the complaint of the San Mateo County Development Association, the city of Palo Alto and the Palo Alto Chamber of Commerce against the Southern Pacific Company, in which request had been made that the commission reduce the peninsula rates. The San Mateo County Development Association asked for a reduction of the inter-station fares in San Mateo and Santa Clara Counties. The city of Palo Alto and the Palo Alto Chamber of Commerce asked for a reduction of the rates between San Francisco and Palo Alto. In its decision the commission held that the complaint that the existing rates were unreasonable, unjust and discriminatory had not been sustained. The decision states that recently a compromise was reached on these rates between the peninsula bodies and the Southern Pacific Company by which substantial reductions were made. The commission states that while the complaints under consideration are not directed primarily at these compromise rates, they are directed against inter-station rates, and if these inter-station rates are reduced, the effect will necessarily be another general reduction in the peninsula rates. The commission points out that the reductions heretofore made in the peninsula rates for individual monthly commutation service have been of substantial benefit to the peninsula communities. The opinion discussed at length the various rate schedules about the bay. The commission held that the rates charged for the electric suburban service in Alameda County do not form a proper basis of comparison for the steam service under the conditions pertaining on the San Francisco peninsula.

Personal Mention

Mr. H. C. Couch, president of the Arkansas Light & Power Company, Arkadelphia, Ark., has been elected president of the Arkansas Association of Public Utility Operators.

Mr. Wallace E. Higgins has resigned as vice-president and general manager of the Lackawanna & Wyoming Valley Railroad, Scranton, Pa., to take up other business. Mr. Higgins has been connected with the company since its organization in 1903.

Mr. A. J. Purinton has resigned as general superintendent of the East St. Louis & Suburban Railway, East St. Louis, Ill. Mr. Purinton was appointed to this position in July, 1912. He was formerly superintendent of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.

Mr. John P. Garner, formerly connected with the United States Life Insurance Company, and at one time a manager for the Chicago Telephone Company, has been appointed commissioner of public service of Chicago by Mayor Thompson. Mr. Garner succeeds Mr. Montague Ferry, who was appointed by former Mayor Harrison as Chicago's first commissioner of public service.

Mr. Thomas Hilliard, St. Catharines, Ont., has been appointed secretary of the Canadian government purchasing commission. He is of English birth, is an electrical engineer, and was technical sales manager for a number of years for the Canadian General Electric Company and later for the Canadian Crocker-Wheeler Company. The Canadian government purchasing commission will have charge of all the purchases of material for use in the war. It has established quarters in the Booth Building, Ottawa.

Mr. P. J. Murphy has been elected vice-president and general manager of the Lackawanna & Wyoming Valley Railroad, Scranton, Pa., to succeed Mr. W. E. Higgins, resigned. Mr. Murphy was born in White Haven, Pa., and prepared for college at Harry Hillman Academy. In 1898 he was graduated from Lafayette College with the degree of electrical engineer. Since that time he has been employed by the General Electric Company, the International Traction Company, Buffalo, N. Y., and for the past ten years he has been engaged in important engineering and operating work for Ford, Bacon & Davis, New York, N. Y.

Mr. Darwin P. Kingsley, president of the New York Life Insurance Company, has accepted the presidency of the Safety First Federation of America, and under the by-laws of the organization automatically becomes a member of the executive committee as well as the board of directors for the full term of three years. The federation, with headquarters in New York, was organized at a convention held two months ago, attended by delegates from fourteen States representing some of the most important cities in this country. All of the officers, with the exception of the president, were chosen at that time, the office of president being left open to be filled at a later date.

Mr. Ernest Gonzenbach, general manager of the Empire United Railways, Syracuse, N. Y., and associated lines, has been named as the receiver of the Syracuse & South Bay Electric Railroad and the Syracuse, Watertown & St. Lawrence River Railroad. Included in this receivership are two subsidiary companies, the Oneida Lake Terminal Company, owning several hundred acres on the shores and two large islands on Oneida Lake, and the Sagamore Navigation Company, owning and operating a 600-passenger steamboat and a fleet of smaller launches. Mr. Gonzenbach has designated Mr. C. I. Craigmile to act as manager for the receiver, and Mr. E. I. Edgcomb to be attorney for the receiver.

Mr. S. C. Rogers, since 1911 secretary and treasurer of the Youngstown Dry Goods Company and before that treasurer of the Mahoning & Shenango Railway & Light Company, Youngstown, has been appointed assistant treasurer and auditor of the Empire United Railways, the Auburn & Syracuse Electric Railroad and associated lines at Syracuse, N. Y. Mr. Rogers entered upon his new duties on May 15, succeeding Mr. W. W. Foster, who resigned to become treasurer of the Buffalo, Lockport & Rochester Railway. Mr. Rogers was connected with the Mahoning & Shenango Rail-

way & Light Company and its constituents for ten years. Before entering the field of public service accounting and finances he served nineteen years in New York and Chicago with J. M. Young & Company, importers of china, glass and fancy goods. During his connection with the Mahoning & Shenango Railway & Light Company, Mr. Rogers was active in the affairs of the American Electric Railway Accountant's Association and the Central Electric Accounting Conference, and in December, 1910, was elected president of the conference.

Mr. David Daly, the president-elect of the Southwestern Electrical & Gas Association, was born in Boston, Mass., on Oct. 16, 1878. He was educated in the public schools of



DAVID DALY

that city and afterward entered Harvard. When he was twenty-two years old he entered the employ of the Stone & Webster Engineering Corporation, and after serving with that company in Boston in various capacities he was sent by Stone & Webster to Ponce, P. R., as local manager of the Ponce Railway & Light Company. Mr. Daly returned to the United States in May, 1905, and in August of that year he was appointed by Stone & Webster to manage the Houston (Tex.) Electric Company. Later, while retain-

ing managership of the Houston Electric Company, Mr. Daly was also made manager of the Galveston-Houston Electric Railway.

OBITUARY

Rodney Curtis, the first president of the Denver (Col.) Tramway, is dead. In 1885 he with Messrs. Evans, Brown, Keener and others built the line on Fifteenth Street, Denver, which proved the nucleus of the present system. Mr. Curtis was regarded as one of Denver's first citizens.

J. Drew Allen, formerly associated with the Chicago sales office of the Pennsylvania Steel Company and later representing the Taylor-Wharton Steel Company in the Pacific Northwest, died from a compound fracture of the skull sustained while making an examination of rails for a local traction company in Salt Lake City, and died on May 16. He was about thirty-three years old and in his selling experience had made a specialty of street railway track work.

PRIZES FOR TRAFFIC RELIEF SUGGESTIONS AWARDED

About 200 designs were submitted at the recent competition conducted by the Municipal Art Society of New York for the best architectural solution of traffic congestion at the hypothetical intersection of an avenue and a street down which a street car line should run. The designs were judged by prominent officials of several different civic departments and societies of New York. The first prize, \$300, was awarded to John S. Yewell, Peekskill, N. Y. Although the terms of the competition did not specify any particular location, many of the designs, including that of the winner, presupposed the intersection of Fifth Avenue and Forty-second Street. The winning design specified a double-ramp system for the street, one for automobiles and one for street cars, leading underneath the avenue. Most of the plans called for a bridging of the avenue over the car street rather than having the car line bridge the avenue. Several of the designs included an elaborate car waiting station beneath the avenue bridge. In some drawings the car tracks were rerouted around by a less congested street. The plans differed widely in the amount of adjoining property to be condemned in order to provide for the proper traffic relief system desired. No definite plans have yet been made as to whether any of these designs will be considered for actual installation anywhere.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

Middletown & Chester Railway, Middletown, Conn.—Incorporated in Connecticut to build an electric railway between Middletown and Chester. Incorporators: Richard H. Bunce, Gustaf B. Carlson, Isaac Spear, Randolph S. Lyon, George Burnham, Eben Jackson, Dale D. Butler, Middletown, and Robert W. Perkins, Norwich. [Dec. 19, '14.]

FRANCHISES

New Britain, Conn.—The Connecticut Company will ask the Council for a franchise to extend its lines through Myrtle Street, Grove Street, Broad Street, Washington Street and Farmington Avenue as far as Commonwealth Avenue, New Britain.

Cedar Rapids, Iowa.—The Iowa Railway & Light Company has received a franchise from the Council to build two additional tracks on Fourth Avenue between Second Street and Third Street, Cedar Rapids.

Long Island City, N. Y.—The Manhattan & Queens Traction Corporation will ask the Council for a franchise to build a loop from Queens Boulevard along Van Dam Street to Review Avenue, along Review Avenue to Laurel Hill Boulevard, to Packard Street and back to Queens Boulevard, Long Island City.

Cleveland, Ohio.—The Cleveland Railway has asked the Council for a franchise to extend its West Twenty-fifth Street line southward on State Road through Brooklyn. The cost of constructing the extension is to be borne almost entirely by property owners along the route.

Lynchburg, Va.—The Lynchburg Traction & Light Company has asked the Council for a franchise to extend its line from the Fair Grounds to Fort Hill.

TRACK AND ROADWAY

***Ingleside & East Arkansas Railway, Ingleside, Ark.**—This company plans to build a line from Ingleside 25 miles east, via Fisher, to a point in Pointsett County. C. B. Richmond, St. Louis, Mo., is interested.

Northern Electric Railway, Chico, Cal.—Negotiations are pending between this company and the Oakland, Antioch & Eastern Railway for the construction of a branch line from Suisun to the main line of the Oakland, Antioch & Eastern Railway at a point directly opposite Suisun. This branch would give the Northern Electric Railway's Vacaville-Suisun branch direct connection with the Santa Fé Railroad via the Oakland, Antioch & Eastern Railway at Bay Point and with the Western Pacific Railway in Sacramento. The new line will be 7 miles long.

Sausalito (Cal.) Incline Street Railway.—Surveys have been made of this proposed electric-cable railway, right-of-way has been secured and engineering reports and estimates compiled. The right-of-way extends from Water Street, over Oak Lane and continues to the summit of the hill, a distance of 2900 ft. Allen H. Vance, president. [Feb. 25, '15.]

Meriden, New Britain & Hartford Railway, Hartford, Conn.—Work will be begun at once by this company on its line between Meriden and Hartford. Construction will be begun at the Meriden end of the line. From Meriden to New Britain the greater part of the route will be over private right-of-way. A large part of the material has already been ordered and will be delivered as soon as possible. The tracks will be rock-ballasted and will be of the most substantial character. It is expected that the line will be ready for operation throughout within two years. Mayor Daniel J. Donovan, Meriden, is interested. [March 27, '15.]

East St. Louis & Suburban Railway, East St. Louis, Ill.—This company is building an extension of its Lansdowne Avenue line from Linden Avenue south to Lynch Avenue and thence on Twenty-fifth Street to Jones Park, St. Louis. Considerable track has been laid.

Iowa City-Muscatine Interurban Railway, Iowa City, Ia.—Surveys have been completed and the right-of-way almost entirely secured for this company's line between Iowa City, Muscatine and West Liberty. Subscriptions will be solicited to raise the \$250,000 which must be subscribed before the building of the road is begun. A. D. Bowen, Muscatine, is interested. [April 24, '15.]

***Gretna, La.**—Edward L. Slattery and associates are planning to build a 2-mile electric railway from the ferry landing at Gretna to a point on the New Orleans Southern & Grand Isle Railway.

Bangor Railway & Electric Company, Bangor, Maine.—This company has notified the Mayor of its willingness to cooperate with the city of Bangor in improving the condition of the city streets by filling in the depressions between its tracks and repairing its tracks where necessary.

Springfield (Mass.) Street Railway.—This company is considering the petition of the Van Horn Citizens Club for an extension of its line from the corner of Chestnut Street and Carew Street, through Carew Street to connect with the present tracks on Page Boulevard.

Michigan United Traction Company, Jackson, Mich.—This company has placed in operation its extension from Kalamazoo to Grand Rapids.

Michigan Railway Company, Kalamazoo, Mich.—This company has contracted with the Michigan Railway & Engineering Company to build a 2½-mile cut-off from Yorkville on its Battle Creek-Allegan division to Gull Lake. This cut-off will take the place of a line running from Gull Lake Junction on the Michigan United Traction Company's line near Battle Creek to Gull Lake. The new line will be the same standard of construction as that adopted for the Kalamazoo-Grand Rapids line, namely, 2400-volt, third-rail.

Muskegon, Casnovia & Saginaw Interurban Railway, Muskegon, Mich.—Surveys have been made of this proposed line from Crystal Lake to Muskegon, 80 miles. C. S. Gamble, former city engineer, was in charge of the survey. [May 1, '15.]

Jackson Light & Traction Company, Jackson, Miss.—This company will begin at once rebuilding its tracks on Capitol Street, Jackson. The work will consist of the complete tearing up of both tracks, the laying of 6 in. of concrete under the ties and paving with wood blocks.

Metropolitan Street Railway, Kansas City, Mo.—This company will begin at once the reconstruction of its track on Holmes Street between Twenty-third Street and Thirty-first Street and on Brooklyn Avenue between the Belt Line and Thirty-first Street, Kansas City.

Trenton, Lakewood & Seacoast Railway, Trenton, N. J.—This company, which is planning to build a line from Lakewood to Point Pleasant, has asked the Board of Public Utility Commissioners of New Jersey for permission to issue \$520,000 of securities, comprising \$200,000 in stock and \$320,000 in bonds. It is stated that residents along the right-of-way of the proposed road have engaged to take all of the securities. George O. Vanderbilt, Trenton, is interested. [Jan. 2, '15.]

Binghamton (N. Y.) Railway Company.—This company is extending its line to Johnson Field, Binghamton.

Brooklyn, N. Y.—Bids are desired until June 15 by the Public Service Commission for the First District of New York, for constructing Section No. 1 of Route No. 29, being part of the Eastern Parkway subway (Nostrand Avenue branch), Brooklyn, beginning at a point under Eastern Parkway about 192 ft. west of Nostrand Avenue, extending under Eastern Parkway and Nostrand Avenue to a point about 220 ft. south of Church Avenue. Plans and specifications can be obtained at the office of the Public Service Commission.

Brooklyn, N. Y.—The Public Service Commission for the First District of New York has directed its chief engineer to prepare plans for the construction of the Utica Avenue subway in Brooklyn. This subway will be a branch of the Eastern Parkway subway, which will be operated by the Interborough Rapid Transit Company. It will be a two-track underground railroad, extending from Eastern Parkway down Utica Avenue to Flatbush Avenue. The Utica Avenue route was not included in the dual system contracts

and the city has not appropriated money for its construction. Property owners in the vicinity have petitioned the commission to have it built upon the assessment plan, the cost to be assessed against the property benefited. This method of construction is permitted by the rapid transit act but has never before been used.

Brooklyn, N. Y.—Bids will be received until June 11 by the Public Service Commission for the First District of New York for the supply of 5,000,000 lb. of steel rails and corresponding quantities of ties, spikes and other material needed for track construction on the New Utrecht Avenue elevated railway in Brooklyn, a branch of the Fourth Avenue subway.

New York, N. Y.—A new route for a connection between the Bronx Park branch of the existing subway at Simpson Street and the proposed Pelham Bay Park branch of the Lexington Avenue subway in the Bronx has been adopted by the Public Service Commission for the First District of New York, and sent to the Board of Estimate. The commission advised the board that the necessary money for the construction of the said connection should not be deducted from the existing funds appropriated to carry out the construction provisions of the dual system contract, and that if the connection is built it will be necessary for the Board of Estimate and Apportionment to appropriate additional money. Residents of the eastern part of the Bronx have been urging the construction of this connection for some time. The new route provides for an elevated railroad running through Westchester Avenue so as to join the two lines.

Port Jervis (N. Y.) Traction Company.—Plans are being made by this company to extend its line to Milford, Pa.

New York State Railways, Syracuse, N. Y.—In connection with repaving work being done this company is relaying its track for $2\frac{1}{4}$ miles on East Genesee Street, Syracuse. It is estimated that the work will cost about \$75,000.

Durham (N. C.) Traction Company.—Grading has been begun and track will be laid at once by this company on its 2-mile extension in Durham.

North Carolina Traction Company, Winston-Salem, N. C.—Specifications will be ready about June 15 and contracts will be let during the summer or autumn for this company's proposed line from Winston-Salem, N. C., north, through Forsyth and Stokes Counties, Va., to Christiansburg. The northern terminus will connect with the main lines of the Virginian Railway and Norfolk & Western Railway, and the southern terminus will connect with the Norfolk & Western Railway, Atlantic Coast Line and Southern Railway. Two bridges will be built, one 300 ft. long and the other 150 ft. long. Benjamin D. Hammond, P. O. Box 21, Station A, Boston, Mass., general manager.

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio.—This company has placed in operation its extension from Chauncey to Athens.

Brantford (Ont.) Municipal Railway.—Work has been begun by this company rebuilding and extending its track in Brantford.

Toronto (Ont.) Railway.—This company has begun the work of laying tracks on Ossington Avenue, north of Bloor Street, Toronto, for the extension which has been ordered by the Ontario Railway Board.

Willamette Valley Southern Electric Railway, Portland, Ore.—Plans are being made by this company to build an extension of its line from Mount Angel to Salem.

Phoenixville, Valley Forge & Strafford Electric Railway, Phoenixville, Pa.—This company's line through Phoenixville has been completed.

Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa.—Surveys have been made of this company's proposed extension from Koppel to New Galilee. With the exception of one, all rights for the new line have been secured. The line will connect with the Pittsburgh, Lisbon & Western Railroad, a steam road extending from New Galilee through Darlington to Lisbon, Ohio, which will be purchased by the Pittsburgh, Harmony, Butler & New Castle Railway and converted into an electric line.

Scranton & Binghamton Traction Company, Scranton, Pa.—About 80 per cent of the grading has been completed on this company's line between Nicholson and Montrose. Poles are being erected and wires strung along the route and the work of laying track is being pushed with the expectation that the line will be completed to Montrose early in the fall. It is the plan of the company to finish the connection from Montrose to Binghamton next year, when there will be through trolley service between Scranton and Binghamton.

***Bristol, Tenn.**—Surveys have been completed through East Tennessee and contracts are being awarded for the construction of an electric railway from Kingsport to Newport. Surveys are also being made for an extension of the line to Bristol to connect with the Norfolk & Bristol Railway. LeRoy Park, Bristol, is among those interested.

Beaumont, Liberty & Houston Traction Company, Houston, Tex.—The holdings of this company have been taken over by Franklin Watson and W. N. Vinton, Columbus, Ohio, who will form a construction company for the purpose of starting work on the project. Application for a charter will be made at once and the company organized with a capital stock of \$300,000. Edward Kennedy, who has promoted the enterprise, will not be identified with the new company. J. H. McCracken, Houston, general manager. [April 17, '15.]

Houston, Richmond & Western Traction Company, Houston, Tex.—Two routes are being discussed for this proposed railway, one being via Eagle Lake, Columbus, Flatonia and Seguin, and the other via Wharton and Yoakum. Houston will be the eastern terminus and San Antonio will be the western terminus. Construction will be begun as soon as the route is finally determined upon and right-of-way secured. E. Kennedy, Houston, is interested. [May 15, '15.]

Abilene Gas & Electric Company, Abilene, Tex.—Plans are being made by this company to extend its lines to Clyde, Putnam, Baird, Cisco and possibly other towns east of Abilene. The new section will be a high-tension line 48 miles long, extending eastward from Abilene in the general direction of the Texas & Pacific Railway, paralleling that road wherever possible.

Kanawha Traction & Electric Company, Parkersburg, W. Va.—This company has been organized and the following officers elected: Edward Brast, president; W. W. Jackson, vice-president; M. G. Ambler, secretary, and Ben T. Neal, Jr., treasurer. [May 8, '15.]

Milwaukee Western Electric Railway, Milwaukee, Wis.—Surveys have been made of this company's proposed extension in Merton and it is expected that construction will be begun by July 1.

SHOPS AND BUILDINGS

Wilmington & Philadelphia Traction Company, Wilmington, Del.—Bids are being asked by this company for the erection of a 60-ft. addition to its office building at Delaware Avenue and du Pont Street, Wilmington. The north wall of the building is to be removed.

Boston & Worcester Street Railway, Boston, Mass.—Plans are being made by this company to begin work at once on a new freight house to be built on South Street, Hudson. The building will be 25 ft. x 65 ft.

Piedmont & Northern Railway, Charlotte, N. C.—A contract has been placed by this company with Fiske-Carter Construction Company, Greenville, S. C., for the reconstruction of its freight depot at Anderson, S. C., recently damaged by fire. The cost is estimated to be \$20,000.

POWER HOUSES AND SUBSTATIONS

Parkersburg, Marietta & Interurban Railway, Parkersburg, W. Va.—Sanderson & Porter, engineers, are supervising the construction of a new 5000-kw steam power station in Parkersburg. For economical reasons the new structure is being built on a different site from that of the old power station which it will replace. The new power house will be about 100 ft. x 150 ft. and of concrete, brick and steel construction. Contracts have been let for the main equipment, including generators, boilers, switchboard apparatus and transformers. It is expected that the building will be completed by Jan. 1, 1916.

Manufactures and Supplies

ROLLING STOCK

Butler & Grove City Railway, Grove City, Pa., expects to order two passenger cars in the near future. This is in addition to the two internal-combustion locomotives recently ordered, as noted in last week's issue.

McConnellsburg & Fort London Railway, McConnellsburg, Pa., is having two 44-ft. steel, cork-lined, combination passenger and baggage cars, with Baldwin K type trucks, built by the Niles Car & Manufacturing Company.

Cleveland & Erie Railway, Girard, Pa., is having two light-weight 51-ft. steel, cork-lined, center-vestibule interurban cars with Baldwin A type trucks, built by the Niles Car & Manufacturing Company. The cars are of Niles standard structural steel construction, no pressings from special dies being permitted.

Tucson (Ariz.) Rapid Transit Company has ordered through the Federal Light & Traction Company, New York, its controlling company, four one-man arch-roof cars from the Wason Manufacturing Company. The cars will be of wood construction and of the front-entrance type with closed vestibules. The Federal Light & Traction Company reports that operating expenses per car-mile on the lines of its subsidiary, the Las Vegas Light & Power Company, Las Vegas, N. M., have been cut in two by the adoption of small one-man cars. The former two-man cars of this line cost during 1912 18 cents per car-mile to operate. This figure includes all operating charges and also taxes, but not interest charges. The larger cars were replaced in 1913 by one-man cars, the operating cost of which during 1913 was only 9.05 cents per car-mile, or half the amount of the previous year.

TRADE NOTES

Union Spring & Manufacturing Company, Pittsburgh, Pa., has moved its New York office from the Singer Building to 50 Church Street.

Corliss Carbon Company, Bradford, Pa., manufacturer of motor and generator brushes exclusively, has removed its office and stock room to the Engineering Building, 114 Liberty Street, New York City.

Imperial Brass Manufacturing Company, Chicago, Ill., recently adopted a rather unusual departure from the ordinary selling plan. Two of its expert oxy-acetylene welding and cutting engineers started in an automobile on a "coast to coast" trip. The automobile carries a complete Imperial welding and cutting equipment as well as supplies, and practical demonstrations of its safety and efficiency are being made in various garages and manufacturing plants in all cities along the route.

British Westinghouse Company, Manchester, England, has long had a small rifle range at its works for the use of an organization among its employees. When war broke out the company increased the size of this range so that no less than thirty-six men can now use it, ten using the 25-yard range and twenty-six at the 50-yard range. The cost of the improvement, together with that of the rifles, telescopes, etc., was largely covered by voluntary subscription of the employees. The company gave considerable financial assistance and lent the grounds. Instruction classes in rifle shooting are now being held among the boys under seventeen years of age employed in the shops and offices of the company. Up to date 1506 men have left this company to join either the army or the navy, news having been received that twelve out of this number have been killed in action. The company has set aside a large sum of money for the purpose of helping the dependents of those who have left. Up to the present time the number of families receiving weekly relief is 674.

ADVERTISING LITERATURE

Bonham Recorder Company, Hamilton, Ohio, has issued a catalog entitled "Earnings Per Passenger-Mile."

Dearborn Chemical Company, Chicago, Ill., has issued a folder in regard to its service in analyzing feed water for boilers.

Draeger Oxygen Apparatus Company, Pittsburgh, Pa., has

issued a folder in regard to its pulmotor for resuscitation from electric shock.

Ohio Brass Company, Mansfield, Ohio, has issued a folder on its rail bonds. The folder announces an order received from this company for 30,000 rail bonds for the first 225-mile section of the electrification of the Chicago, Milwaukee & St. Paul Railway, now under construction.

Delta-Star Electric Company, Chicago, Ill., has issued folder No. 49 which describes the automatic high-speed sphere gap S. & C. arrester. The valve action of this arrester is well demonstrated and will be of interest to those concerned with high-tension transmission.

Edward B. Smith & Company, Philadelphia, Pa., bankers, are distributing a form sheet for the convenience of their customers in listing investment securities. The sheet contains columns for properly listing the name of the company in which the security is held, the amount, par value, kind of mortgage or lien, interest rate, rate of security, income due each month, total income, purchase and appraisal price, State and federal tax and actual cash value of the security.

Hanna Engineering Works, Chicago, Ill., have issued a catalog describing the various types and details of their compression yoke riveters for car and bridge building, for which the Vulcan Engineering Sales Company, Chicago, Ill., is sole agent. In this type of riveter there is combined in a simple form toggles, levers and guide links to give the large opening of the toggle joint movement with its gradually increasing pressure so that the desired pressure is reached, then a simple lever movement throughout a considerable space under approximately maximum pressure. This space is sufficient so that there need be no uncertainty about pressure applied on the rivets; and, once adjusted for a certain length of rivet and thickness of plate, the machine will require no further adjustment for ordinary variation in length of rivets, size of holes, or thicknesses of plates.

NEW PUBLICATIONS

Statistics of Railways of the United States, 1903-1913.

Bulletin 1975: Bureau of Railway Economics, Washington, D. C. 81 pages. Paper.

This pamphlet is the first of an annual series containing statistics for the latest ten-year period for which official figures are available on the subject of railway statistics. The tabulations are based upon official data published by the Interstate Commerce Commission and the census bureau. The pamphlet is a convenient reference book for steam railroad statistics, inasmuch as it does away with the necessity for consulting separate volumes of official statistics.

Validity of Rate Regulations. By Robert P. Reeder. T. & J. W. Johnson Company, Philadelphia, Pa. 1914. 440 pages. Buckram, \$5.

The one subject in connection with commission activity that is of most interest to electric railways and yet is least fully understood on account of the highly technical legal features connected therewith, is that of the validity of rate regulations. With both the Interstate Commerce Commission and the various state commissions promulgating rulings in regard to rate regulations, it is almost impossible for the electric railway official to classify the decisions on established points or to follow the trend of rulings on the many unsettled problems.

For these reasons, this book by Mr. Reeder should be of great interest, both as a treatise dealing with the principles of constitutional law involved in rate regulation, and as a compilation of 4000 citations on the various points involved. It presents a broad discussion of the purposes of those who placed in the federal constitution the provisions bearing upon rate regulations, and explains the contrast between state and federal power in this matter, the methods of making and of enforcing regulations, the principles governing the valuation of property, the constitutional rate of return, discrimination in regulation differentials and the impairment of contract. While many electric railway operators may not agree with the author on the mooted questions of valuation, depreciation, rate of return and the like, the book should serve as an invaluable basis for counsel in the preparation of rate briefs. By omitting the footnotes and case citations the layman can also obtain a clear analysis of this intricate subject.