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PUBLIC OWNERSHIP IN WASHINGTON

The American Electric Railway Association has taken prompt action to voice the objections of the industry to the proposal for public ownership of electric railways in the District of Columbia. The plan to municipalize the railways was proposed in a bill introduced by Congressman Crosser, of Cleveland. Preliminary hearings were held by a sub-committee, of which he was chairman, of the committee on the District of Columbia. The sub-committee reported the bill to the full committee, and in the series of hearings before the larger body the association has been represented effectively. The pending measure is of vastly greater significance than any similar measure affecting another city. What is done in Washington may be considered as representing the national policy. Congress has no control over any substantial part of the urban electric railways of the country. Its control is limited to lines that are engaged in interstate commerce. The control of electric railways is left, under the modern policy of regulation, to the states. Yet the bill now pending before the committee proposes legislation radically different from the present settled policies of the country. It proposes public ownership by vote of Congress in a district where the residents have no voice to decide whether or not the innovation shall be introduced. It proposes legislation in the conspicuous capital of the country on a subject that is primarily a function of state or municipal government. Such a step might be of far-reaching effect. Congress is taking up the subject as one of its large number of activities in widely-separated spheres. Its normal function is to legislate in matters that affect the national government, not in those that affect cities or states. The instant that it began, even through a committee or subcommittee, a consideration of public ownership of electric railways it took up as large questions of public policy as any that are before the present Congress. The association did its duty in characterizing the situation as one of national importance.

REASONS FOR CORPORATION PUBLICITY

Although it is fairly well settled that no public service corporation can afford to leave the public in ignorance of its affairs, this doctrine is taken on faith rather than based on conviction by many railway men. But there are fundamental reasons why electric railways in particular must carry their case to the public. One of these reasons was expressed by Mr. Dooley years ago in the assertion that "There is no news in being good." Of course there is news in being good. What the Archey Road philosopher meant to convey was that human nature, and the human nature of newspapers in particular, inclines to the exploitation of what is bad and ignores the commonplace routine of things when they are going rightly. It is for this reason that only the misdeeds and shortcomings of a public utility are exploited. That 10,000,000 passengers are carried in safety and comfort is never made the subject of big headlines unless this fact is woven into a story by someone who is interested in seeing that safety of operation is exploited. On the other hand, if one passenger is killed it is a big story, and the 10,000,000 safely carried are forgotten. Millions of passengers are provided with seats, but the strap-hangers of three hours out of twenty-four are those who get into the newspapers—all of which goes to show that if the good that we do is to be made known along with the bad, an effort must be made to bring the good to the front. It will not come out of its own accord.

DIFFERENT METHODS OF PUBLICITY

An interesting article appears elsewhere in this issue on "Different Methods of Publicity," by W. T. Buchanan, of the Portland Railway, Light & Power Company, Portland, Ore. Mr. Buchanan believes in the efficacy of publicity, but claims that the kind required is principally of a local character and not national and that the chief feature of the publicity should be to attract attention to the readiness with which the company will remove all causes of dissatisfaction where they exist and as far as it can, rather than to discuss abstract principles. We agree with Mr. Buchanan upon the importance of emphasizing the desire of the railway company to please the public and to keep it informed of the character of the service supplied. The publicity should be largely local, as Mr. Buchanan says. At the same time, we do not think that its national aspects should be ignored. A great many of the problems of electric railways are common to all, just as they are in the steam railroad field, and the presentation of the company's case as it exists in one city will answer in many respects for that in another. The united action of steam railroads in their campaign for a 5 per cent increase in their freight rates is a case in point. By telling the facts through all of the agencies available they have made a deep impression on the body politic. The conditions in the electric railway field constitute a harder problem and also probably a more local one. But this, as well as their other difficulties, can be overcome by every railroad that is cleanly financed, well operated and does the best it can for the

accommodation of the public—if it lets the public know what it is doing.

CORPORATION BAITING AND MISREPRESENTATION If the exploitation only of the misfortunes and mistakes of the electric railways was the extent of the misrepresentation to which they are subject, they could often afford to be silent where now it is their duty to speak. But in many cases the misrepresentation extends to the publication of statements which are so erroneous as seriously to prejudice the case of the companies with the public. These statements may sometimes be made intentionally, but we are inclined to believe that in most cases they are due to carelessness or ignorance of the real condition on the part of the speakers or daily papers, often accompanied, we admit, by no great effort to learn the facts. One reason for this, of course, is that the habit of corporation baiting for political advantage, unfortunately, has become one of the established customs of the country, and the fact that an electric railroad comes in contact with an enormous number of people under circumstances which are likely to create causes of dissatisfaction makes the corporation an easy mark for the unprincipled politician or newspaper who wishes to gain a cheap notoriety as "champion of the peepul." Corporation baiting as a favorite sport of legislators and newspapers will go out of fashion when, and only when, they generally recognize that it is not popular with the public, and it will cease being popular with the public when the case for the railroads is understood.

TESTIMONY ON MUNICIPAL OWNERSHIP

For some years following the exhaustive report on municipal ownership published by the National Civic Federation in 1907, little was heard in this country about the municipal ownership of electric railways, but the subject has recently been revived in an acute form in several cities, among them in Washington. The agitation in the latter city does not come from the public but is an exotic brought in by a few congressmen, who have no property interest at stake in the District and who wish to exploit their freak ideas at the expense of the taxpayers. It would be very strange if the national government, with all of the other important problems which it has on hand, should now chase the will-o'-the-wisp of municipal ownership at the recommendation of Representative Crosser. It is not surprising that the proposal has brought out a series of vigorous protests from men throughout the country whose opinion must carry a great deal of weight with the House of Representatives, to whom the District Committee will report.

We have already commented at length upon the address of Mr. McCarter, and last week published abstracts of the addresses of Mr. Crawford of Reading, who was a member of the investigating committee of the National Civic Federation in 1906, and of W. D. Kerr, director of the bureau of public service economics of New York. General Harries, whose remarks are published in this issue, addressed the committee not only as a railroad man of long experience but as a resident for many years of the District of Columbia. Speaking from his knowledge in the latter capacity, he showed clearly that the committee was trying to force the residents of the district into a false economic plan which was not desired by them. He quoted extensively from the records of various municipal plants which had failed from a financial standpoint, and from authorities on civic government who utterly condemn the plan of municipal operation of public utilities. These arguments were reinforced by Mr. Rosecrantb, of Milwaukee, who added further testimony not only in regard to the errors in judgment to which the operators of municipal plants are liable, but showed by the experience in Milwaukee how the public could retain all of the advantages of direct control over the service and charges of a public utility through a regulatory commission and yet avoid the dangers of direct ownership and operation.

According to William J. Clark, the great objective in the creation and operation of public utilities is to secure a maximum of facilities and effective service at a minimum of capital investment and operating cost. On the basis of the numerous and carefully compiled statistics presented by him, it is undeniable that America has more adequate public utility facilities and better service than any other country, while the actual investment and the cost of service are less than in other countries, provided due allowance is made for difference in wages and construction prices. A large portion of Mr. Clark's data was obtained from foreign sources, but when he came to the point of showing the disastrous effect of public ownership he had only to quote from the history of our own country. As he says, an instructive volume on this subject alone could be compiled from the records of our oldest states, whose experiments with publicly owned canals and railroads have been appalling sink holes for the public money. Georgia, North Carolina, Missouri, Indiana and Pennsylvania have all had their fling, and the inevitable result has been conversion to private operation. It is unfortunate that the body politic is not more generally acquainted with the disasters that have overcome government ownership in this country. Manifestly it is not in the power of the average citizen to acquire at first hand the statistics setting forth these facts, but the public can and should heed the voice of those leaders who have thoroughly studied this question. When the last three men chosen as the first citizen of this nation can unanimously agree, as shown by Mr. Clark's quotations, that private enterprise should be permitted to carry on public utilities under proper regulation rather than that the government should attempt to own and operate the utilities, it is time for the average citizen to listen to the voice of wisdom rather than to the rabid cries of those who seem not to learn from bitter experience.

Many other points were brought out. The testimony presented before the committee is not only a convincing argument upon the unwisdom of the plan in Washington but forms a valu-

able addition to literature on municipal ownership of public utilities which should be of great assistance in other cities where this same issue may arise.

OPERATING RESULTS OF SAN FRANCISCO'S MUNICIPAL RAILROAD

In last week's issue we discussed at length the capital items of the report of the Geary Street Municipal Railway, San Francisco, Cal., for its first year of operation, ended Dec. 31, 1913. As stated at that time, there are important omissions from the capital account of the railway, but even on the basis of the report as rendered the rate of return is appreciably lower than that which a privately owned company in California would be required to earn. Facts no less striking than these are readily ascertainable in regard to the operating accounts of the line during the past year. In the light of these facts, the ability of the line to earn an adequate profit on the investment is open to serious doubt.

The present receipts per car mile and per mile of track on the municipal line indicate that the few miles of track which it possesses are in a favorable situation from a traffic standpoint. This was to be expected because the line began operations in a fully developed territory with a large riding clientele already available. It is taking the "fat" without any "lean." But with an extension of its lines into the suburbs the indications are that the revenue passengers will increase only at a rapidly decreasing rate. This limitation of future increases in revenue becomes of greater importance when the probable increase in operating expense is examined. This is not because operating expenses are intrinsically of greater weight in determining the net income but because the revenues of any electric railway depend largely upon business and economic conditions, whereas the operating expenses are subject to managerial control and indicate very closely the attitude of the management on the questions of the up-keep of property and the wages paid to employees.

In these respects the results for the past year on the Geary Street line are illuminating. At the present time the maintenance expenses are very low, as would naturally be expected with a new road. For way and structures they are only 2.7 per cent of the operating expenses as compared to 10.1 per cent on standard city roads as reported for the thirteen principal city properties in the United States Census report for 1907, and for maintenance of equipment they are only 5 per cent as compared to the standard 13.5 per cent. To be sure, the municipal line in addition charges 14 per cent of its gross receipts to depreciation, but even with this sum it is very doubtful whether the maintenance charge will be sufficient. The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., for example, sets aside 22 per cent of the gross operating revenues to cover these items on its railway property, exclusive of power plants and substations, which makes it comparable with the Geary Street line. On this basis the latter line would be required to expend for maintenance and depreciation of track and equipment $97,844, which is $19,360 in excess of its present provisions.

The maintenance expenses of the municipal railway are highly interesting in themselves, but they assume a position of increased importance when considered in the light of expenses for conducting transportation. Already these are 86.2 per cent of the total operating expenses, as compared to the standard 59.3 per cent shown by the thirteen city roads quoted in the 1907 Census report. The employees of the municipal line are receiving 37½ cents per hour for an eight-hour day. Nevertheless, as noted in the Electric Railway Journal of March 21, 1914, they are already clamoring for increased wages and special privileges, such as one day off with pay every week, ten hours on call for eight hours work and free uniforms. T. A. Cashin, superintendent of the line, has submitted to Mayor Rolph four schemes for complying with the ten-hour demand of the men, the most economical of which would increase the operating expenses $32,850 a year. The expense of giving the platform men a day off every week would be $20,280 a year, while the same privilege allowed to the shop and other employees would necessitate an expenditure of $15,015 additional. The employees of the road may not obtain all these demands, but it is well to bear in mind one of the great criticisms against English municipally owned traction lines—that with approaching elections the English papers refer to the great pressure brought to bear upon those holding office by bodies of municipal employees to secure any desired end, particularly a limitation of hours and an increase in compensation. It is almost inevitable that the wage scale on the Geary Street line must soon be altered certainly in favor of the older employees, who naturally will expect a higher wage than the new men, as on privately owned electric railways. Especially will this be the case since the $3 per day now paid the men is less than the rate per day which is paid the senior men on the United Railroads of San Francisco, or $3.67.

We have seen how time will increase the maintenance and transportation expenses of the line and thus cut down the net income even if no extensions were built. Let us now consider the effect of the extensions already proposed. The present Geary Street line runs from the park and beach to the Market Street ferries, a route that provides good patronage on Sundays as well as during the week, and traverses a territory already developed during the operation of the old Geary Street Railway. The line is straight for nearly the full length, and the grades comparatively low. The road has the privilege of transferring to crosstown lines of the United Railroads of San Francisco at four points so that it has the advantage of serving a large territory while maintaining only a profitable trunk line. The proposed extensions of the municipal system, however, are not situated under such favorable conditions. Several of them are on grades so heavy that the operating expenses will undoubtedly be much higher, and on the Union Street line, certainly, the problem of new equipment with special trucks or other safety provisions must be solved.

As extensions are made, also, pressure will be

brought to bear to have the municipal system extended through light-traffic districts with a view of developing real estate. As with other Western cities the speculative real estate interests in San Francisco are powerful, and the wire pulling, political bickering and sectional disputes which will follow any plan for extensions will not only complicate the management of the municipal system but may seriously hinder its operation. The decision to build new lines should be based entirely on the opinion of traffic experts as to whether the probable traffic would make the extension good business policy. If any other principle is followed private land owners would be benefited at the expense of the road. Traffic experts of private companies are better qualified than the public to pass on the advisability of extensions, even assuming that the public has not been misinformed by private interests and that there are no political forces at work to influence votes.

To sum up the whole matter, there is no doubt that the Geary Street line has not yet encountered the most difficult obstacles on its path to success. Certainly the question as to whether the extensions of the municipal system can be built, maintained and operated at a profit is not determined by the results of operation up to the present time. In reality, no profit is being made even with the present high receipts and only partly developed operating expenses, and much less favorable traffic conditions are to be expected as a result of the future. We should not close without mentioning one beneficial result which has accrued from municipal operation in San Francisco. There are fewer complaints to the United Railroads of San Francisco since the municipal line began. The public is beginning to realize that such matters as no-seat, no-fare ordinances and over-crowding during rush hours are not being solved by a municipal road.

USELESS WEIGHT IN STEEL CARS

In a communication in our last issue F. M. Brinckerhoff calls attention in a distinctly striking manner to the evils of unnecessary weight in steel cars. Solely from the standpoint of power consumption the matter is, of course, no new one, but Mr. Brinckerhoff has gone a step further in pointing out that the cost of the steel work which is in excess of requirements may amount, even in a small order of cars, to a considerable sum.

The point which is raised cannot be well gainsaid. Fabricated steel of any given class has been found by long experience to cost almost directly in proportion to its weight, and every car in which are incorporated steel members that are either unnecessary or else fail to develop their full strength not only increases operating costs in the power house but also burdens the railroad with fixed charges that have a direct and deleterious influence upon the profits of the enterprise. Indeed, as indicated by our correspondent, the difficulty of even finding capital is so great to-day that it would constitute still another important reason for eliminating useless weight if those already quoted were not sufficient.

This point of the cost of useless weight is one which has, apparently, been realized but vaguely heretofore. It has, no doubt, been obscured by the fact that, with wooden cars, cost and weight are not proportional when very light constructions are employed. With wooden cars the labor cost rises so rapidly, as the construction is lightened, that it more than offsets the saving in material, and in the end the total cost of the very light car may be even greater than that of one which is somewhat heavier. The same condition does not apply to steel, at least in the class of construction that is commonly used for electric railway cars. A heavy member will require more and larger rivets to hold it in position than will a lighter, thinner piece, and except in the case of rough castings, where the only labor required is that to handle the material, the lighter piece will never fail to involve a smaller cost of labor for installation.

Of course, one of the stock arguments against light car weight has been that of high maintenance cost, and with wooden cars this is probably sound to a certain extent. The same argument, however, by no means applies to the properly designed, light steel car, and in support of this statement we can point to the communications from P. V. See and R. R. Potter, published elsewhere in this issue, both of which have reference to the maintenance cost of the steel car bodies of which the writers are in charge. In neither case has anything more than the most incidental repair work been found to be necessary, and as both of the types of car referred to are light in weight, the experience with them may safely be taken as evidence that high maintenance cost is by no means a necessary accompaniment of light car construction.

As a matter of fact, it is high time for this subject of steel car design to be scrutinized with more attention to the analysis of the expected strains and stresses than it has received in the past. Years of experience with wood and with the rule-of-thumb methods suitable for a material of such variable quality have been the cause of some most unfortunate designs in steel, and so long as the old methods of design are followed steel cars will continue to carry around, incorporated in their framing, metal for which they have no more real need than a bird has for ballast.

The major part of this tendency seems to be due to a willingness to accept complication in design, to permit the existence of filler blocks or their equivalent through lack of foresight, and to allow for various purposes the use of metal which does not and cannot do its full share in resisting the strains of service. Certainly the steel car is here to stay, but, even so, its inherent advantages of light weight and low maintenance cost will be of very little benefit to the industry until the fact is recognized that it cannot be designed by guesswork, in the way that the wooden car has been and, indeed, is designed to-day. If the requisite time and effort cannot be devoted to a study of the factors involved, electric railways may just as well penalize themselves by adhering to the wooden car with all its disadvantages.

The Tri-City Railway's New Carhouse in Rock Island, Ill.

A Fireproof Concrete and Brick Structure of Which Four of the Seven Bays to Be Contained in the Complete Building Have Been Finished

The old adage which states that some events are blessings in disguise applies to the fire which destroyed the old carhouse and shops of the Tri-City Railway & Light Company in Rock Island, Ill., in the spring of 1913. Unfortunately, however, at the time of the fire the old building contained approximately all of the company's new type pay-as-you-enter cars, and all but a few of these were destroyed. Much of the framing of the old building was of the slow-burning type, but peculiar conditions surrounded the origin of the fire which destroyed this building in that a bolt of lightning seemed to pierce its entire length, resulting in such a widespread and instantaneous blaze that a sprinkler system or other fire-fighting apparatus was of little avail. In addition to this the lightning interrupted the supply of energy to the carhouse trolley circuit. This made it impossible to remove cars except by hand, although a number of employees were in the building.

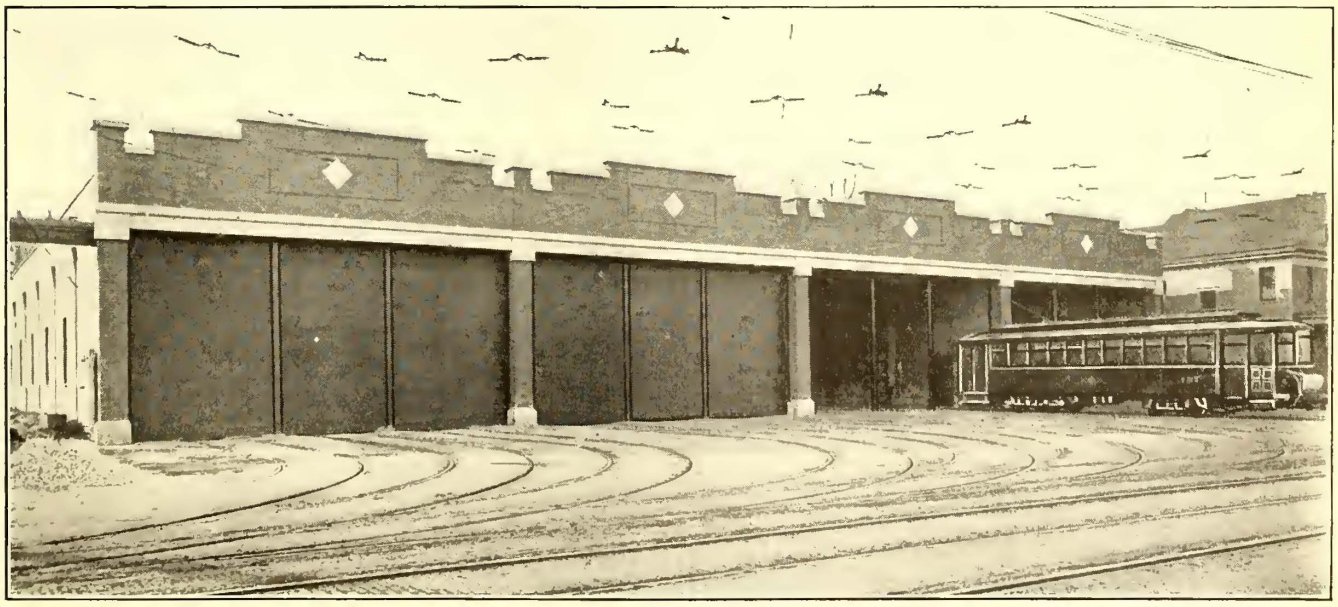
The new building was built on the proposed site of the Rock Island repair shops, which were to have been constructed during the summer of 1913. This property is located centrally from an operating standpoint and is separated from the steam road right-of-way, where a track connection may be had, only by an intervening street. The portion of the carhouse completed represents four bays of a seven-bay structure, over one bay of which will be provided a two-story section. The first floor of this two-story portion of the carhouse will be occupied by the receiver and storerooms, and the upper portion will provide quarters for the trainmen's club. In plan that part of the new structure which has been completed is 150 ft. in width by 296 ft. 6 in. in length, with the rear end of one of the outside bays 95 ft. 6 in. shorter than the others. Each bay is of sufficient width to provide three storage tracks at 10-ft. 6-in. centers, all of which lead into the building from a ladder track paralleling the double main tracks in the street in front of the building, and stub end at the rear of each bay. Under each storage track is a 34-ft. inspection pit. At the present time one storage bay is being used temporarily as a repair shop and is provided with concrete pits 183 ft. 4 in. in length, under the three tracks, as well as additional skylight area.

BUILDING CONSTRUCTION DETAILS

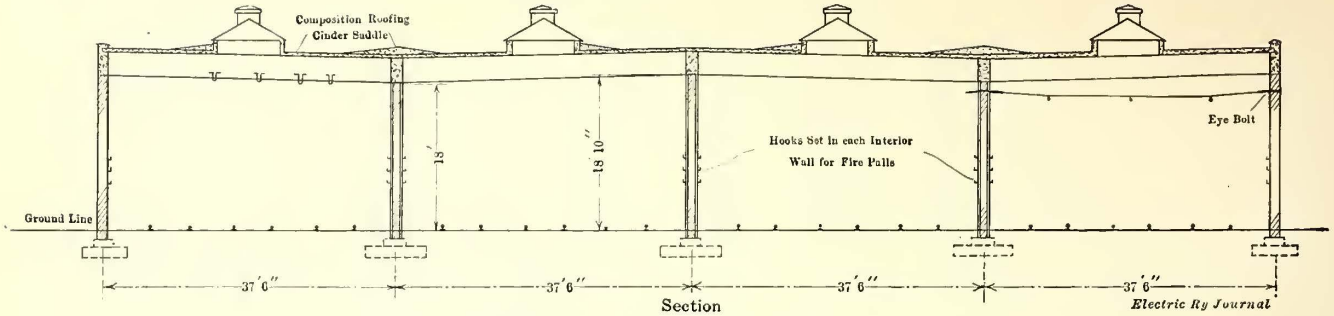
This carhouse was constructed on the site of an old stone quarry which had been filled, hence the roof was not carried by the side walls. Essentially the structure consists of a reinforced-concrete building frame and foundation, surmounted by a reinforced-concrete slab roof and enclosed with brick curtain walls. The footings under the columns are carried well below the property level and have a unit loading of 1 ton per square foot maximum. The interior reinforced-concrete building columns are 16 in. square, and the 12-in. x 32-in. reinforced-concrete beams spanning the bays and supporting the concrete slab roof alternately rest on the building columns or are cast as a monolith into the 16-in. x 36-in. girders between the columns along the curtain walls which separate the bays.

As shown in the building cross-section, the roof is of solid 4-in slabs with ribbed metal reinforcing, poured on a solid forming, after which cinder-concrete ridges and valleys were constructed to provide proper roof pitch to the downspouts. Over this a five-ply tar and gravel roof was laid and flashed with 14-ounce copper at the fire walls and along the skylight wells. All brick except those in the building front are Purington paving block laid in lime and cement mortar. The front is built of a special pressed face brick laid in black mortar and trimmed with white terra cotta.

The face of the building is 45 ft. back of the street line and the entire areaway between it and the street is paved. By setting the building inside of the property line, sufficient space was provided to store a car without blocking the street or sidewalk. All tracks in



Tri-City Carhouse—Front View of Building



Tri-City Carhouse—Cross-section of Building

the building are laid with 70-lb. A. S. C. E. rail fastened to 6-in. x 8-in x 8-ft. ties embedded in concrete in a trench below the floor. The floors are of concrete sloped from a 1½-in. crown in the aisle between tracks to a 1-in. depressed valley between the rails of each track, in the repair bay and to the rear of the pits in the storage bays. That part of the floor back of the pits in the three storage bays is laid with paving brick. At the low points in the floors track drains are provided at sufficiently frequent intervals to insure the proper drainage of the entire floor area of each bay.

PIT CONSTRUCTION

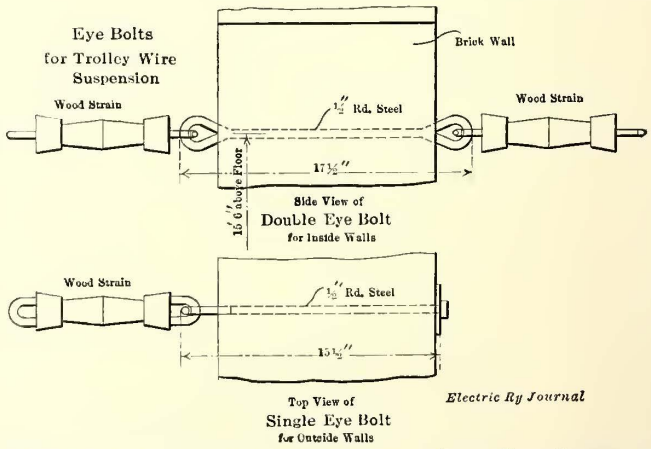
The inspection and repair pit construction is somewhat unusual. Concrete pedestals 14 in. square are supported on spread footings and the pedestals support a 14-in. x 16-in. reinforced-concrete beam to which the 70-lb. A. S. C. E. rail is securely anchored. Rail anchor bolts are placed in pairs spaced at intervals so as to provide sixteen bolts per rail in the beams over the short pits and seventy-six bolts per rail in the long pits in the repair bay. As shown in the detail, these bolts are ¾ in. x 6 in. in size, and fitted with ¾-in. cut washers at the end embedded in concrete, and cast-iron rail clips and hexagon nuts serve as the fastenings for the base of the rail.

A 9-in. reinforced-concrete slab spans the space between pit walls forming the aisles between tracks. This slab rests on the reinforced-concrete beams carrying the track rails and is built with two 3-in. x 10-in. jack planks embedded in the top surface so that the top of the plank is flush with the floor. These planks are set 4 ft. 3 in. from the center of each track, which places them approximately under the side sills of the cars. The space between pits under the aisle floor, as well as that in them, has been provided with concrete floors which slope to drains installed along the center line of each pit.

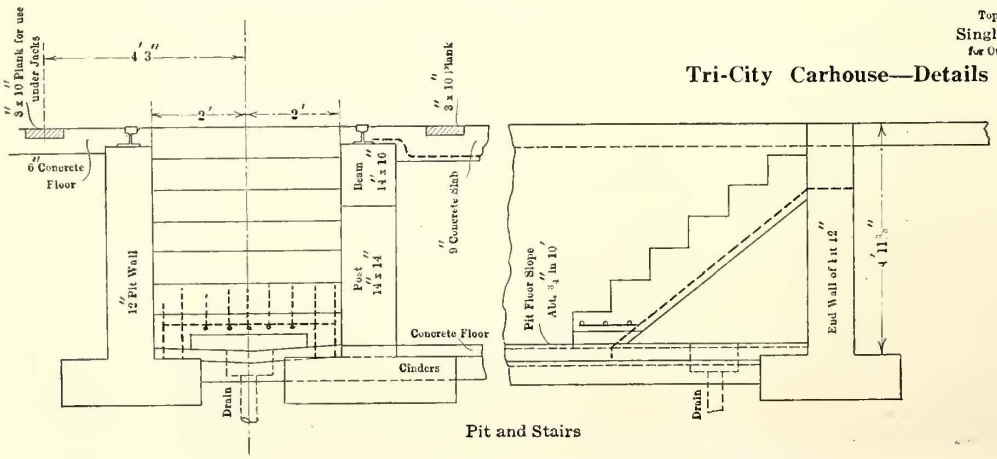
Another construction detail of interest is found in the manner of supporting the overhead trolley wires in the building. In the three storage bays the span wires are connected to eyebolts embedded in the brick building walls. In the interior walls these eyebolts are ½-in. round steel, set in the 13-in. brick walls and provided with eyes on both ends. In the exterior walls the ½-in. round steel eyebolts extend through the wall, and the outer ends are fitted with 3-in. square washers, ¼ in. thick. Each beam spanning the four bays is provided with cast-steel inserts over the center of each track for protection against a flying trolley, and the beams over the repair bay are provided with five ½-in. loops in addition to the inserts to serve as points for attaching hoists used in handling repair parts.

As shown in one of the half-tone illustrations, combination skylights and ventilators were installed along the center line of each bay. The wells with 8 ft. in clear width were cast in the reinforced-concrete roof and provided with 6-in. curbs projecting 18 in. above the roof line. Lupton steel skylights glazed with wire-glass and fitted with 36-in. Burt automatic ventilators are set over these curbs. Tungsten lamps with wide reflectors were swung from the beams supporting the roof.

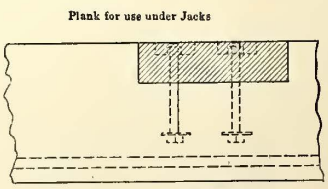
The entrance ends of all bays are inclosed with Kinnear rolling steel doors, and provided with posts



Tri-City Carhouse—Details of Suspension Wire Supports



Pit and Stairs



Details of Bolts in Planks for Jacks

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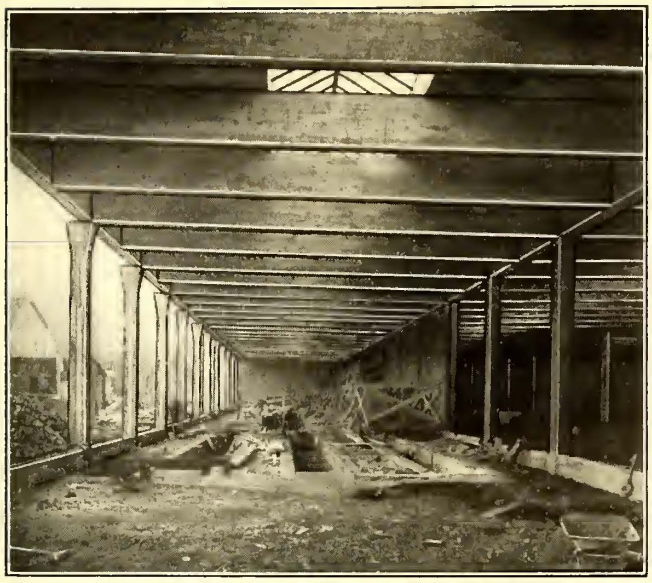
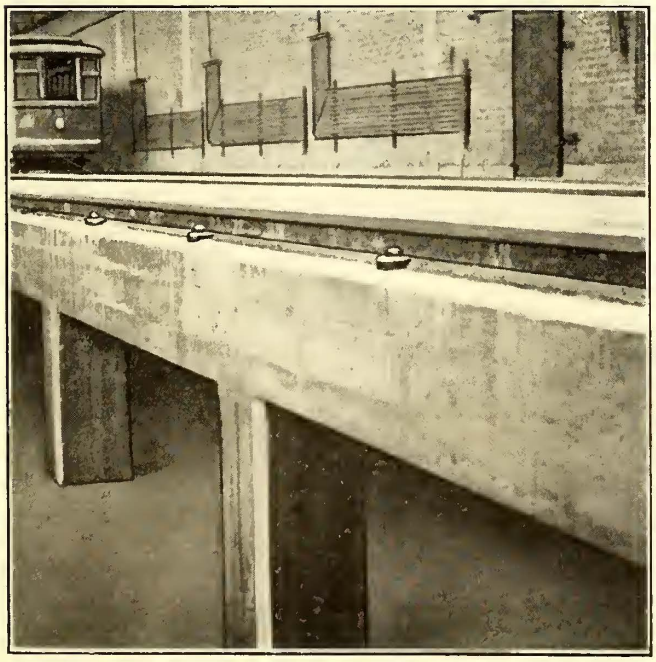
Tri-City Carhouse—Details of Pit Construction



Tri-City Carhouse—View Showing Concrete Construction

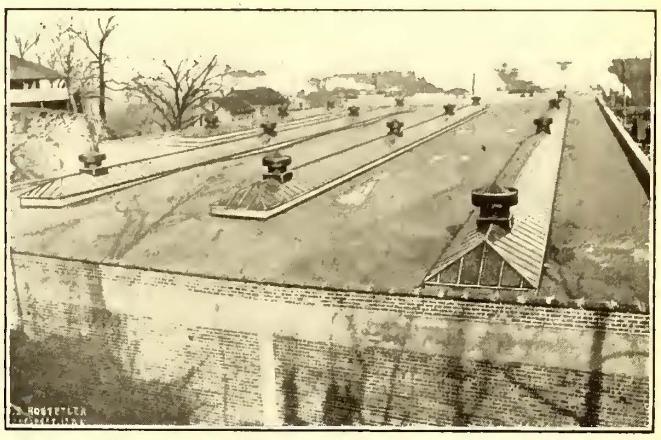
hinged at the top so that they may be raised to give a clear opening between partition walls. Each entrance is fitted with three rolling doors giving an 18-ft. clear headroom. All other doors, which include those in the partition walls between bays, are standard, tin-clad fire doors constructed to meet the underwriters' specifications. Each opening is provided with a pair of doors, one for each side of the wall and arranged to close automatically. All of these doors excepting those in the bay used temporarily for repair purposes, are designed to remain normally open, those in the latter are to be normally closed.

Owing to the character of building construction employed, which carries a low insurance rate, as well as the limited overhead clearance, it was considered unnecessary to install a sprinkler system. Three hydrants were installed in the partition walls of each bay. In addition four hose connections were set in iron boxes in the floors of each bay about 26 ft. inside the entrance doors. These are located in the aisles between tracks and along the building walls. Fifteen standard sand pails and six chemical fire extinguishers are placed for convenient access.



Tri-City Carhouse—Inspection Pit Construction

Steam heat is provided by built-up pipe coils supported in short sections on the building walls. These are fed from mains also supported on brackets on the walls just below the trolley span wires and drain to the return system in a concrete conduit under the floor and adjoining the walls. The heating plant proper is housed in an adjoining building, but when the remaining three bays are added it will be included in the new structure.



Tri-City Carhouse—View Showing Roof

The plans and specifications for this building were provided by the engineering department of the Tri-City Railway & Light Company under the direction of B. J. Denman, chief engineer. The construction work was handled by the Central Engineering Company, of Davenport, and completed in the remarkably short time of seventy days.

NOTES ON BOILER PRACTICE

R. E. Hagenah, superintendent and chief engineer of the Springfield (Ill.) Light, Heat & Power Company, states that a saving of approximately 62.5 per cent is effected by the substitution of flat for sprung arches hitherto used. The flat arches can be constructed for three-fourths the cost of sprung arches and the life of the former has proved to be fully twice as long as the latter. The boilers in the station are all of the water-tube type and fuel is fed to the grates by means of chain-grate stokers. The boilers are of three makes, namely, Stirling, Babcock & Wilcox, and Springfield.

The penalty of operating boilers under too great draft was well exemplified in an instance cited by Charles M. Rogers before the recent Mississippi Electric Association convention. He mentioned a plant situated in an important bituminous coal field where the best grade of fuel was obtainable without freight charges. Its furnaces were arranged for burning about 7 lb. of coal per sq. ft. of grate area, but owing to careless fire-room regulations a draft of 0.55 in. to 0.60 in. of water column was maintained on these boilers, or sufficient to burn 50 lb. to 60 lb. of fuel per sq. ft. of area. The result was that an excess quantity of air was passed through the fire, cooling it and diluting the CO_2 content to about 2.3 per cent. Under these conditions the fuel bill was about $1,000 a month.

Later the draft was reduced to 0.08 in., improving the efficiency and output of the boilers to such an extent that it was possible to cut one unit out of service altogether. Meanwhile the fuel consumption fell to $650 a month, showing a saving of a third of the former bill under conditions of poor draft regulation.

The Training of Platform Men

This Vital Subject Formed the Basis of a Profitable Discussion by the Public Service A. E. R. A. Section on May 21—The Paper Was Followed by a Lecture by Prof. A. S. Richey

At the regular meeting of the Public Service Company Section of the American Electric Railway Association held in Newark on May 21, Charles H. Coe, chief instructor Public Service Railway, read a paper entitled "Training the Trainmen."

He said in part that such training is important because every person who uses the cars deals directly with conductors and motormen. The platform men are the points of contact between the company and the public. They are, in a very large measure, the medium through which the public forms its impressions, and by which the company and its service are judged. It would seem, therefore, that any effort to promote cordial relations between the company and the public must necessarily take into consideration the platform men. If an even headway is maintained; if the conductor and motorman are courteous in their treatment; if the car is properly ventilated and heated; if the motorman starts and stops his car smoothly, complaint or criticism are never heard. If, on the other hand, the conductor has a grouch, or the air in the car is vile, or a long gap exists between cars, or the motorman, when he starts or stops his car, throws the passengers off their balance, then you hear complaints and unfavorable criticism.

PATIENCE IN TEACHING REQUIRED

Patience in teaching is necessary because the class of men seeking employment is not always up to the standard of intelligence required. This is demonstrated when it takes, as it does in some cases, from two to three hours to teach a man how to pull a controller handle around and recognize the points. At the present time you can find plenty of men to handle big jobs; there is no trouble to get men who can build a railroad, move a mountain, or tunnel a river. We are thoroughly equipped for titanic tasks. We carry a full assortment of trip-hammers, steam shovels and subway drills in our tool kits. If you can pay the bill, there are a thousand quiet, modest men who will undertake a transcontinental tunnel. The civilization of to-day dares to achieve what it yesterday feared to dream. There are a hundred markets from which we can secure competent "wizards." There is a glut of leaders and generals. The school of progress is educating a-plenty of engineers, inventors and scientists to cope with the demands of the times, but we are short of men who do small things in a big way. This is the weak link in our chain of organization.

We pay too much for errors. We have been so eager and absorbed in the perfecting of driving wheels and gears that we have forgotten all about the bolts, nuts and screws. The moment a valuable piece of machinery is entrusted to a man, he becomes a most important factor in the process of operation. If he fails to perform his duty, all the effort and intelligence expended antecedent to that duty are jeopardized. Special trains of thought and instruction are regularly derailed by the mistakes of incompetent subordinates. It is very necessary, therefore, to properly instruct and follow up the platform man. One is very apt to underestimate his capacity for damage, and because he cannot create one is liable to forget his power to wreck. A crawfish cannot build a dyke, but it can dig a hole that will destroy one. A half-wit is not capable of constructive work, but he can do a mighty lot of tearing down. Turning our attention to the lower rank of the organization and safe-guarding ourselves against ignorance and shiftlessness will spell in large letters—"Economy."

Training the trainmen is a subject which is being taken up seriously by the larger companies and some of the smaller ones. You will no doubt recall that some years ago a motorman or conductor was employed by the superintendent of the division without any investigation. He was placed on a car with a motorman or conductor more or less competent, or one who had a number of grievances. About the only thing the instructing motorman or conductor did was to pour into the ear of the student his many imaginary wrongs. Naturally the student became discouraged at the start and the impression he formed was that the company and its officials were his enemies. After breaking in for three or four days, the student was started with a car, if the superintendent happened to be short of men. This was apparently all right so long as the car got back to the carhouse on time and the full complement of cars was on the line, but during the last few years many changes have been brought about.

EARLY INSTRUCTIONAL WORK BY THE PUBLIC SERVICE RAILWAY

On Dec. 1, 1907, our present general manager, who had been on the property but a few months, realized the necessity of training the platform men. A school was started on the second floor of the Miller carhouse in an 8 by 14-ft. room; $150 was the amount to be expended, of which the superintendent of buildings used $110 for benches, leaving a very small margin for equipment. This consisted of four boxes with five lamps on each, representing motors; three boxes of grid resistance on a frame with six lamps to show, step by step, how resistance was cut out; a K-6 controller wired to these lamps, and an overhead switch or circuit-breaker. These were all used to demonstrate how the current passed through the car. The first work was to endeavor to teach the motormen how a controller should be notched to start the car properly. No instruction was given at that time to conductors. One year later the school was enlarged and another school was established at Montgomery Street, Jersey City, to take care of the Hudson division. Both conductors and motormen were instructed. Six months later a school was established at the Newton Avenue carhouse, Camden, to take care of the southern division. Each of these schools was placed in charge of an instructor who reported to the chief instructor. Two chief motormen and two chief conductors were attached to the Miller and the Hoboken schools, and to the Camden school, one assistant instructor who acted as chief motorman and chief conductor.

PRESENT METHODS

At present the superintendent of employment receives applications on stated days in the different divisions. Each applicant's past record is investigated before he is employed, and a doctor's examination is insisted upon.

The day following his employment the "student" reports at the school of instruction at 8 a. m. for preliminary instruction, provided with his breaking-in card and his outfit. A student's primer is handed him to read for the first hour. Conductors are taken in hand first and the following subjects are treated by the instructor: General talk on safety, courtesy, loyalty

and honesty; conditions under which the man is going to work; rates of pay; fares, tickets, passes, etc., in use by the company; punching and receiving transfers; how to keep a day card and make out transfer envelopes; how different types of fare boxes are operated; accidents and how to prevent them; how to make out accident reports; how to get witnesses. In the afternoon, at 1 o'clock, the student again reports at the school and is put on the instruction car for actual operation, the car being in charge of a chief conductor. The subjects taken up by the chief conductor are: position, how and where to stand; where the light switches are located; how to handle register and fare box; how to ventilate a car, in summer and in winter; bell signals; flagging railroad crossings; opening and closing doors to prevent accidents, etc. The following day the student reports at the carhouse to which he has been assigned, and is placed on a car with an instructing conductor who has been selected with great care as to record, loyalty, and ability to instruct. This course is followed for from five to six days and if, in the opinion of the instructing conductor, the student is competent at the expiration of that time, he signs the man's breaking-in card. The following day the student again reports at the school at 8 a. m. for final instruction. He is recorded as "reporting for final" and is placed on the instruction car in charge of the chief conductor. If, from a practical standpoint, the chief conductor believes the student is competent, he signs his card; if not, he so reports, and the student is given another chance and is sent back to the carhouse for more instruction. After signing the card, the chief instructs the student to report at the school at 1 p. m. for written or oral examination, covering the following: making out day card, transfer envelope, mailing slip, delay slip, pay slip, punching transfers and stating when and where to receive them. If the student is found competent the chief instructor signs his card and the student is told to report to the supervisor at the carhouse to which he has been assigned. After a satisfactory examination of the student by the supervisor as to the former's knowledge of localities, the supervisor signs the breaking-in card, which is forwarded to the superintendent of employment for filing.

With the motorman a similar course is pursued. For the preliminary instruction he is first taught position, how to stand on the car; how to notch the controller and to use the hand brake. This is done with dummy controllers and brake staffs placed in the same position as on a car. This drill lasts about two hours. The student is shown how to make emergency stops, how to operate a car up or down grade, and the proper use of brakes and power. An explanation is given of the course of the current from the time it leaves the power house until it passes through the car. The names of the different parts of the equipment and their locations are made clear. No technical language is used. For instance; instead of measuring resistance by ohms it is measured by feet, and it is demonstrated to the student that as he notches his controller he cuts out a certain number of feet of grids and permits more current to get into the motors, thus providing more power and causing the car to move faster. These facts are demonstrated by a machine on the floor of the schoolroom and by lamps on a demonstration board. The matter of wiring a car is touched upon only lightly, excepting as to motor leads, trolley, and ground fingers in controller.

In the afternoon the student is placed on the instruction car with the chief motorman, where he is taught practical operation. All parts of the equipment are shown and their use explained. He is told how a car will act under different conditions; with motors cut out, up and down grade, without brake or power, etc. The following day he reports at the carhouse to which he has been assigned and is placed on a regular car with an instructing motorman. The student motorman generally puts in four days of daylight and three nights on trial. When the instructing motorman judges him competent, his breaking-in card is signed and he is told to report at the school the following day for final examination. Upon reporting he is placed on the instruction car in charge of the chief motorman, who allows him full swing, correcting any mistakes he may make. If he is found not up to the standard, the chief motorman so reports to the chief instructor and if the latter agrees with the motorman he is sent back for further instructions. If found competent by the chief motorman, the student's card is signed and he is ordered to report at the school at 1 p. m. for a final written and oral examination. If he passes, the breaking-in card is signed by the chief instructor, and the student is ordered to report to the carhouse to which he has been assigned, to be examined by the supervisor as to local conditions. If he is found competent, the supervisor signs his card and it is forwarded to the superintendent of employment for filing.

Instructing motormen and conductors receive extra compensation of twenty-five cents per day when imparting knowledge to students.

FOLLOWING UP THE TRAINMEN

The follow-up instruction is given by chief conductors and chief motormen and, as time will allow, by the chief instructor. Each day the traveling chiefs are given a list of students who have qualified on the previous day. A list is also kept on file in the schoolroom and checked each day by the chiefs. A daily report is also made by the chiefs, giving student's name, badge number, time of boarding and leaving car, remarks as to progress, etc. The rides taken by the chiefs are of from one to three hours' duration and are kept up for from ten to fourteen days, or even longer if a student is backward. Mistakes and omissions are pointed out to the student in a quiet manner by the chief. Frequently it is found that the student lacks confidence in his own ability and this the instructor endeavors to restore.

To be effective this instructor must have the support of the men in charge of the carhouses. If loose organization, an indefinite policy, unjust, irrational or inconsistent treatment of men prevails, any advantages obtained by the best system of training ever instituted will be offset.

OTHER USES OF THE SCHOOLS

The schools are also used when men are to be disciplined. For instance, a man suspended for any cause, such as abuse of equipment, accident, or a violation of rules, is ordered to spend one or more days there. This is much better than having him spend the day in idleness. Inspectors and station masters promoted from the platform are required to qualify both as conductors and motormen, that is, if a promoted man has been a motorman he is required to qualify as a conductor, and vice versa. Supervisors, inspectors and station masters are required to report at the school every thirty days to keep in touch with changes in equipment and new developments.

RESULTS OF THE WORK

During the year 1913 there were 2092 conductors and motormen appointed, 449 reappointed and 29 reinstated. Of this number 2138 qualified, being a decrease from the year 1912 of 392. For disciplinary reasons 1866

platform men attended the school. The number of rides given students by the chief motormen and chief conductors was 8644. For the first three months of 1913 there were 106 motormen appointed and 40 reappointed. During the first three months of 1914 64 motormen were appointed and 29 reappointed; conductors, first three months of 1913, 362 appointed, 62 reappointed; conductors, first three months of 1914, 230 appointed, 38 reappointed. This is a decided decrease. The proportion of reappointments in 1914 is larger than in any preceding year, showing that more of the men who had left the service desire to return.

DISCUSSION

In commenting on Mr. Coe's paper several officials of the company stated their practical agreement with the points made, and amplified some of those bearing directly on operation. L. T. Baurhenn, representing the transportation department, emphasized the fact that cordial relations between the company and the public must necessarily depend upon the platform man. He commended the follow-up system, especially as a factor in preventing discouragement of new men. In a large system the local conditions under which the men are to work should be considered in instructing them. Mr. Baurhenn agreed that the chief motormen and conductors should have the cordial support of the road officers and division superintendents, who should not do anything to offset the results obtained by the system of training. He is personally glad to have the chief motormen and conductors ride with the new men in his division, the Bergen division, and to spend as much time as possible with them. He knows that the new men are safe when thus accompanied and he has no anxiety concerning them.

G. L. Walsh, of the Passaic division, discussed Mr. Coe's paper from the standpoint of the claim department. He assumed at the outset that the men under discussion are strong, healthy and possessed of ordinary common sense. Without these requirements no method of instruction is satisfactory. When a new man is employed he is evidently "green," and is apt to be timid with respect to his new duties. The chief instructor, therefore, should endeavor to make the new recruit his friend or little can be expected from him. The first impression is lasting. In regard to the dullness of brain referred to by Mr. Coe, it should be said that with proper attention nine times out of ten these dull applicants can have their wits sharpened and with proper coaching can be ultimately developed into good men.

While it is true that certain men can remove mountains, build railroads, etc., it took them a long time to acquire the requisite knowledge. Outside of these specialties some of these men have as much difficulty learning new things as does the man who is learning to operate a trolley car. The proper instruction of platform men has an important relation to operating troubles. For example, a motorman may not know what to do when a finger on his controller "sticks." It causes a tie-up of the line and it is quite possible that he may have difficulty in securing the proper assistance. Again in the case of a derailed car one sometimes sees the crew seated comfortably but making no effort to replace the car on the rails, waiting for the wrecker and not at all concerned that the whole line is blocked. Motormen should be so instructed that they will handle their cars as if they were their own property. The best possible organized shop force will not prevent high maintenance cost if cars are operated by poorly instructed or careless motormen.

Instruction has important relations to the reduction of the number of accidents. Among the most common of these are the derailings caused through failure of motormen and conductors to observe the proper precautions at steam railroad crossings, and the opening of the doors of pay-as-you-enter cars before the cars stop, or giving the bell signal to start the cars before the rear doors are closed. Well-trained crews can also assist the claim department in securing the names of witnesses after an accident.

N. W. Bolen, superintendent of transportation, emphasized the importance of the follow-up system and stated his belief that even more than fourteen days of this should be allowed for. J. W. Brown, assistant general superintendent, called attention to the great opportunity for accidents that is presented by a property like the Public Service Railway, where the daily mileage is 136,000 and the number of passengers carried 1,000,000. He wittily reversed an old adage stating that "A company is known by the men it keeps." He said that all men are not qualified to become trainmen, and referred to the experiments made by Professor Hugo Münsterberg. He believes that the professor's experiments will ultimately be very helpful in electric railway work.

R. E. Danforth, general manager, illustrated how men can be educated to save money for a company. Accidents can be easily avoided if the men know how to do so, but they are easy to produce through ignorance. Men who are older in the service should instruct the new ones. While there are certain instructors appointed, the inspectors have an opportunity to extend the educational work. New men are very liable to become conceited after a month or so of work and to think that they know all that is to be known. Mr. Danforth gave a number of illustrations of the points made by previous speakers and related them particularly to the work of the Public Service Railway.

POWER REQUIREMENTS AND ENERGY CONSUMPTION IN ELECTRIC RAILWAY WORK

The second feature of the meeting was a lecture by Professor A. S. Richey, of the Worcester Polytechnic Institute, in which he discussed the mechanics of car operation. He showed that energy is used up in starting a car, in friction, in overcoming grade resistance and in momentum. He explained how energy can be saved by proper control of the speed of a car, particularly by the use of quick acceleration and as much coasting as possible. He discussed the typical time-speed curve, showing that it consists of four parts: straight line acceleration while resistance is being cut out; acceleration on the motor curve while the counter electromotive force is coming up; coasting, and braking.

He showed how coasting recorders and other devices designed to call attention to the energy saving which could be made by proper handling of cars, serve to accomplish the desired results.

The interest with which Professor Richey's lecture was followed shows that practical operating men are glad to have the theory of their work explained in terms of that work. At the close of the lecture the speaker was given a unanimous rising vote of thanks by the section.

At a recent dinner of the Rotary Club, Rock Island, Ill., John G. Huntoon, general manager Tri-City Railway Company, read an interesting paper on the evolution of transit facilities and the mergers which resulted in the present Tri-City Railway Company. The paper gave a complete history of the changes from horse, mule and steam dummy power to electricity, and reviewed the increases in population in the communities which the company serves after electrification of the Tri-City system.

Hearing on Public Ownership of Street Railways in Washington

The Following Report Covers a Continuation of the Hearing Held at the Request of the American Electric Association, Abstracted in Part in Last Week's Issue

Since the publication of last week's issue of the ELECTRIC RAILWAY JOURNAL, additional testimony has been offered in Washington on the Crosser bill providing for public ownership of the electric railways in the District of Columbia. As in the previous week, the testimony was presented before the committee on the District of Columbia of the House of Representatives. The speakers, with one exception, represented the American Electric Railway Association. The exception was a representative of the National Electric Light Association, who attended the hearing at the request of the public policy committee of that association in view of the importance of the issue involved. Abstracts of the testimony presented at the hearings on May 22, 26 and 27 follow.

TESTIMONY OF GEN. GEORGE H. HARRIES

Gen. George H. Harries, vice-president of H. M. Byllesby & Company, said that he appeared as past-president of the American Electric Railway Association and for the committee on federal relations of that association.

General Harries said that there has been no popular support in the District of Columbia for government ownership of the electric railway lines here. This lack of public initiative, he declared, was most significant. He said that it might be due to the lack of necessity for such a change in ownership or the result of the belief of the community in the efficiency of the present system. He declared that he had yet to hear the first suggestion from any body of citizens for such a proposal as that contained in the Crosser bill. Usually, he declared, one would expect a community to initiate such a movement; that it would come from the people most vitally interested. The taxed, but unrepresented, people of the District of Columbia, he declared, have one thing in common with the citizens of other communities—the privilege of speech. But on this subject, he insisted, they had voiced no demand.

The thirty-five citizens' associations in Washington, said General Harries, had been silent on this question, although they have always been the first to discuss questions of real public interest. They have not asked Congress, or any other source of power, he maintained, for the municipalization of the electric railway lines. The Chamber of Commerce of Washington and the Washington Board of Trade, both representative organizations of business men, had not asked for the passage of such a measure. As far as the traction facilities of Washington were concerned, those who have compared it with similar service in other cities would have to admit that in the matter of track distribution, of equipment, of rolling stock and of general relations between the companies and their employees as well as with the public, Washington had no ground for complaint. He insisted that the local service was excellent and cheap.

BURDEN WITHOUT RESPONSIBILITY

General Harries added that the measure proposed to lay a great financial burden upon people who have not asked for it and that it sought to make them bear the entire responsibility for the experiment. The bill required the United States government to use its power to compel the District of Columbia to buy and to operate the electric carriers of the District. The government in this measure not only failed to indorse the project it undertook to inaugurate, but expressly disavowed all responsibility for it. The bonds to be issued would not be government bonds and the government would not endorse them. The bill makes the bonds purely a District of Columbia matter, and the District had nothing to do but to accept what a superior power imposed upon it.

Representative Prouty, of Iowa, asked the witness why there has been no greater public interest in the District in the pending measure. General Harries replied that he thought the District had not awakened to the importance of the measure and that apparently its residents did not take it seriously. The bonds proposed in the bill would not even have a fixed financial status because they would be subject to future legislation. The District of Columbia would have no power over them, it could only accept what was given to it and do what it was told to do.

General Harries cited a report that one of the District commissioners, in a speech, had declared that the railroad regulation within the District, now imposed upon the commissioners as members of the Public Utilities Commission, required too much of their time, and that the proposition was too large for them. Representative Crosser interrupted to say that he was the author of that statement. The witness declared that he would not dispute its truth, but suggested that the regulation of public utilities never could be looked upon as a task for dilettante or for occasional doctrinaires. If matters of this kind could be managed even by the most intelligent of the inexperienced, then careful study and expert knowledge were wasted in all undertakings.

REGULATORS THAT DO NOT WORK

As for the allegation that regulation would not work, he declared that if in the plants of his companies a piece of regulating machinery failed to perform its functions properly, a new regulator was installed. The principle of regulation was not abandoned.

The attitude of electric railway managers in favoring regulation, said General Harries, was not entirely an unselfish one. The managers had found that when a public service commission passed upon a complaint and ordered certain things done, it left the companies in a much better position toward the public by relieving unnecessary friction and by furnishing assurance that compliance with the commission's orders would result in public satisfaction.

The witness declared that the nation might be headed for government ownership, but that he was one of the many who did not believe that. He declared that he had too much confidence in the ultimate good sense of the American people, and that he could not look forward to a day when questions of the detail of electric railway management should figure in the political issues of a campaign.

With government ownership accomplished, General Harries declared, there would be political battles over

details of technical operation. On one side would be found a party that pledged itself to four-motor rolling stock because it wanted speed. On the other side would be those who favored two-motor equipment because it was economical in its consumption of energy. In one city a mayor would fail of re-election because he favored trailers. In another city aldermen would be elected on the relative merits of longitudinal and cross-seats. Votes for women might destroy a candidate who had male and heretical views on the height of car steps. Then there would be party platforms that pointed with pride to the uniforms of their trainmen or viewed with alarm the style of equipment of a competing party. A President of the United States might put himself out of the running because he had ordered cars painted green or yellow, and thereby alienated a vast and important section of the vote. Nothing in the world could be made more productive of campaign issues than the transportation business.

MUNICIPAL OWNERSHIP IN EDMONTON

Figures of deficits in municipal ownership properties in Australia, as well as a comparison of the government and private telephone companies were presented by General Harries, who, however, laid chief stress on detailed figures of the experience of Edmonton, Alta., as a "wonderful exhibition of what municipal ownership will do." This new city of the great Canadian northwest had taken up municipal ownership at the beginning in almost all of its departments of public service. There has been no question of dishonesty, for all of its officials have been capable, clean-handed men whose absolute honesty, however, had been coupled with an inability to make municipal ownership and operation pay. He read from the official publications of the city the figures of the accounts for the last year. In its street railway department, these figures showed a deficit of $405,934. Part of this was the result of the fact that a new carhouse scheduled to cost $100,000 had cost $170,000. Despite the fact that the enterprise was an exceedingly new one and that it had not been compelled to take over an inheritance of antiquated machinery the service was hampered by obsolete apparatus. In the waterworks department of Edmonton, the deficit totaled $100,574. In the telephone department of the municipality the deficit was $69,000.

FURTHER EXTENSIONS IMPOSSIBLE

General Harries also read from the report of the commissioner in charge of the electric railway department of Edmonton the statement that the maintenance charges as well as the capital charges had shown such a heavy increase that it would be impossible to make further extensions. In addition to this he recommended an increase in the fares, and these had to be put into effect. The witness emphasized the fact that all of these difficulties confronted a municipally owned corporation which had all the advantages of being in a new community with no superimposed indebtedness as the result of experiments with bob-tailed cars, with two-horse cars, and with the early efforts of electrical conduit systems, and of cable and pneumatic systems before the present trolley or underground service had been installed.

Without any of these burdens, declared General Harries, and without any of the problems that hamper companies in older cities, the municipal commissioners of Edmonton had been compelled to advise against the construction of further extensions until the finances had improved. He also read from the reports of the City Council which adopted the increased fare rates, the statement that the paving work chargeable to the street railway system in Edmonton would be paid in the future out of the general revenue of the city.

"This is but a sample," said General Harries, "to show how they must toil somehow or other to make a showing. It is a confession of the results, but it is an interesting exhibition of municipal honesty and frankness."

DEFICIT IN MUNICIPAL FERRIES

The witness then took up the figures of the Staten Island ferry system operated by the city of New York. The city's loss, he declared, had exceeded $2,000 a day since it had taken over these ferries. These boats, he said, had been operated profitably by private corporations until the demand of the people of Staten Island for better service than the business would justify resulted in the establishment of municipal ferries. Now the whole community has to pay the bill. One result of the municipalization of the ferries which had much to do with the deficit was the big increase in the payroll. This, he declared, was to be expected in any municipal operation in this country.

As one of the chief arguments of the proposed municipal ownership had been the operation of waterworks by cities throughout the country. General Harries made a comparison between the work of the Consolidated Gas Company of New York and the waterworks system in that city. The gas company was able to purchase its coal and oil, to transport them to New York, to produce and distribute the product through a complex system of mains to consumers throughout the city at a price of 80 cents per 1000 cu. ft. New York City, he said, sells its metered water at $1 per 1000 cu. ft. or 20 cents more than the price of gas, which it is so costly to produce.

OPINION OF HALFORD ERICKSON

General Harries read a letter written by Halford Erickson, a member of the Railroad Commission of Wisconsin, whom he described as one of the ablest commissioners in the United States. The letter was addressed to Frederic W. Fleitz, vice-chairman of the Water Supply Commission of Pennsylvania, Harrisburg, Pa. Mr. Erickson declared:

"From my personal experience in the matter, as well as from experience of this commission, I have come to the conclusion that state regulation of public utilities should cover municipally owned plants as well as privately owned plants. In fact, it is fully as necessary that it should cover municipally owned plants as well as any other. There are several reasons for this. Municipally owned plants are not managed with any greater efficiency and enterprise than prevail in other work that is usually performed directly by cities. That is, the service is usually defective, and the rates either unreasonably low or unreasonably high, as well as unjustly discriminatory. This commission receives relatively a greater number of complaints affecting municipal owned than privately owned utilities. These complaints do not only cover service matters and extensions of such service, but they cover rates and all other practices that are usually subject to regulation. Investigation also discloses that the complaints are all well taken. In fact, the commission finds it necessary in the case of almost all of these complaints to order into effect improvements in the service and equitable rate schedules.

"In my judgment the question of the ownership of utilities should not be the basis of the application of state regulation. If municipally owned utilities were exempted from such regulation, then the inevitable result would follow that customers who are served by such utilities are likely to receive not only a lower

class of service but they may have to pay rates that were unjustly discriminatory in almost every respect. One dislikes to write such matters as this, especially in view of the fact that there seems to be a widespread impression to the effect that municipal ownership is a guarantee of good service and equitable rates. Nevertheless, what I say seems to be the fact, and not only in this state but in many other places where I have had occasion to look into the situation."

In reply to a question from Representative Crosser, General Harries declared that the companies tried to live up to the demands of public sentiment. He said they tried to be right and fair in their dealings with the public and to treat the public as partners.

PARTNERSHIP AND CO-OPERATION

"It is a comfortable feeling to be your partner," said Representative Crosser.

"Yes," replied the witness. "You have no responsibility, financial or otherwise. If there is a failure you are not to blame; if the financial machinery topples over you are not hurt. But I want to ask of you the co-operation we are entitled to as partners. You cannot expect all the privileges and none of the responsibilities of partnership. What we want is that spirit of partnership, and I think that when the public realizes that, it will go far towards making satisfied customers, and they are the only kind of customers worth having."

INCREASE IN REALTY VALUES

General Harries quoted statistics to show the enormous increases in realty values which had resulted from electric railway extensions throughout the District of Columbia. In eight years, he said, the electric railways of the District had added $46,000,000 to the taxable values, and had been responsible for continuing increases as high as 100 per cent a year. At the same time, he said, the railroads that had accomplished this had accumulated deficits of $1,000,000. He presented these figures to show the fallacy of the belief that the electric railway business had been extremely profitable as the result of the lavish giving away of charters in earlier days.

The witness also cited decisions of the United States Supreme Court to prove that franchises were property, and that the contract embodied in them between the government and the companies were inviolable despite the clause reserving the right "to alter, amend, or repeal." These reserve powers, he declared, the courts had held must be exercised only to carry into effect the original purposes of the grant and to protect the public. The alterations must be reasonable and made in good faith.

GOVERNMENT RED TAPE

General Harries then declared that public utilities demanded instant operation at all hours of the day. Everything must move with promptness. This, he said, could not be accomplished under any government the District of Columbia had ever had. In government management the form and substance of all essentials were so concealed in windings of red tape that it would be impossible to recognize the thing itself. No public utility, he declared, could ever be operated under such a system. If the government went into the electric railway business, he declared, it would have to change its methods or go into bankruptcy. To demonstrate this he cited at length reports of investigation into the Post-office Department and the Government Printing Office.

With reference to the labor conditions under government ownership, General Harries cited the fact that the government does not pension its employees, while private electric railway companies not only do that but maintain elaborate systems of relief associations, death benefits, free medical attendance and profit sharing All of this resulted in the bonds of human sympathy which made it possible to secure effective results from the employees of the company. The government could hope for no such results. For one thing, no government official would be permitted to remain in office long enough to establish such relations with the employees under him. The same difficulty, he pointed out, lay in the peril of the injection of politics into the selection of employees. He told the committee that all members of Congress could testify how often they found places for men in the government service without reference to their fitness.

General Harries also cited as "a new witness" the testimony of President Wilson, who had argued for government control as preferable to government ownership in "The State."

TESTIMONY OF CLARKE M. ROSECRANTZ

Clarke M. Rosecrantz, counsel for the Milwaukee Electric Railway & Light Company, the Milwaukee Light, Heat & Traction Company, and the Wisconsin Gas & Electric Company, said that he appeared for the American Electric Railway Association at the request of the association. The great difficulty in a question of this kind, he said, was to get all the information bearing upon it without prejudice or bias, to proceed on facts rather than on theories.

Mr. Rosecrantz recalled that the hearing during the previous week, one of the members of the committee asked why other companies than those directly affected were represented. He then explained the magnitude of the electric railway industry and the large membership of operating companies in the association. The association felt that if the bill should be reported and favorable action should follow in Congress, the result would be considered by the municipalities as a decision of men who had given careful study to the subject. The question was a large one, and it should receive a most careful investigation. It ought to receive an even more careful investigation than the committee, which had a multitude of matters before it, could give.

While he represented the utilities, Mr. Rosecrantz said that if he could not look on both sides of a question fairly he would think that he could not perform the service which he owed to his companies. If his judgment were so warped that he could not give consideration to both sides, he would think that he was not rendering good service. He suggested that a question of this kind should receive the investigation that a commission like the Monetary Commission would give.

MUNICIPALITY GOES TO OTHER BUSINESSES

Continuing, Mr. Rosecrantz declared that it has been his experience that where a municipality engaged in public enterprises it did not stop at one form of business. The natural steps after public utilities were in the direction of bakeries, mines and other forms of business. Rates were so made as to favor the project owned by the municipality or state over competing properties. Anyone who proposed a change in the District of Columbia should be required to show that this would result in a general betterment. If the operation of electric railways by private companies was not satisfactory to the public, how could the municipality secure more capable men? Companies always sought men of ability to manage, develop and create. If any man had demonstrated ability he was sought by the company.

One great objection to municipal ownership and operation of a public utility was that it did away with the mainspring of human endeavor—the hope of gain. When an employee hoped by his effort to succeed another who held the job a little higher if a change came about, and he was able to secure promotion, he did a little for himself but a great deal more for the general public. Practically every position in the electric railway was secured by promotion. How could this policy prevail in a municipal plant? All that the city employee could do was to hold his job. Efficiency had no effect on the retention of a city employee. He lost his place because of a change in political power. Such conditions existed in all cities of the country. The heads of the city departments knew that they could not hope for continuity of office. There was no incentive for city employees to do better.

CONTINUITY OF SERVICE IN PRIVATE COMPANIES

Mr. Rosecrantz asked how results were secured in business. Were they obtained by frequent change or was continuity of service desired? In privately managed companies a definite policy was continued without unreasonable change or for sufficient time to determine whether or not it was the best one to follow permanently. A city engineer would introduce one system of sewers, but this would be succeeded by another system as soon as there was a change in office. Mr. Rosecrantz said that in private companies there was a desire for advancement and an anxiety to serve efficiently, and a feeling that if progress was shown promotion would follow.

Responsibility meant better management and service, Mr. Rosecrantz declared. In a city there was no one to whom the head of a department was directly responsible. Employees of a city sought jobs because of political influence, and tried to hold them by the same means. They felt that they held their places through pull, and that they could not be discharged. Under former conditions railways found that they could not get anything unless they were in politics and that they could not, in fact, keep alive unless they were. From the time when Mr. Rosecrantz became identified with the Milwaukee properties until the present, they had not been in politics. It was the practice and effort of the management to keep out of politics. In earlier years the sole issue of every campaign was the question of what the candidates were going to do to the railways. The railway was always the object of the attack of the "outs." All of these conditions have been changed. Every effort was made to render good service, and to lead every employee to be courteous. Private ownership was giving good service as nearly as it was possible for any human agency to do.

Representative Igoe said that in the District of Columbia appointments were made by the President, and the question of political influence was not present.

POLITICAL INFLUENCE IN MUNICIPALITIES

Mr. Rosecrantz said that in practically every municipality throughout the country, employees obtained their position through political influence. The conditions promoted changes in office, not continuity, and made for wasteful operation. Government work was always more expensive than private work, and took longer to do. In mentioning an experience with piles of dirt in front of his home in Milwaukee, which remained through the entire winter and until June, Mr. Rosecrantz said that if any electric railway company had been responsible, some one would have been arrested. In speaking about his experiences abroad, he referred to a cotton broker in England who used a cab in traveling from office to office rather than to rely on the slow and uncertain government telephone. He also said that this broker could obtain Liverpool quotations more quickly by cabling to New York and having the message repeated to Liverpool than by a direct communication by government telegraph with Liverpool. He declared that the condition of the subway in Paris was very much worse than anything that had ever been seen in this country.

COMPARE RATES AND SERVICE

In calling attention to quotations from the recent book of Yves Guyot, Mr. Rosecrantz said that it was conceded that publicly owned railways were not operated economically. Many of the statements that were made in regard to public systems were not accurate. For instance, it had been said that foreign telegraph rates were lower than rates in this country. This was not accurate, because a charge was made abroad for the address and the signature. It was not possible to make a fair comparison of rates unless wages paid to employees and costs of construction and operation were taken into account. Rates could not be compared unless service was compared. Cities never showed their accounts in such a way as to permit analysis.

A quotation from the sixth annual report of the Railroad Commission of Wisconsin was read by Mr. Rosecrantz to show the difficulty which the commission had experienced in adjusting the accounts of municipal plants. Referring to the argument that because municipalities had done well with water systems they should be able to conduct other utility services, Mr. Rosecrantz said that there was little capital cost in a water plant after the initial expenditure for the system. It was the easiest utility to operate, whereas the electric railway was the hardest.

One of the members of the committee referred to the practice of gas and electric companies in asking for deposits. Mr. Rosecrantz said that the companies with which he was familiar paid interest on such deposits, and that the practice was a necessary one owing to the large number of persons in a city who, like the Arabs, silently folded their tents and faded away.

EXTENSIONS NOT MADE BY MUNICIPALITIES

Extensions were not made satisfactorily by foreign municipalities which operated electric railways, Mr. Rosecrantz continued. The citizen who had a home with a garden was a better man, and the development of electric railways in this country had promoted the decentralization of the population with great advantage to the community. The result of the English policy of making no extensions or very short extensions was a serious congestion of population. The average city had no intention of building up its suburbs.

CONTROVERSY BETWEEN CITY AND SUBURBS

Mr. Rosecrantz then referred to the situation affecting Milwaukee and its suburbs. A number of the interurban and suburban lines did not pay for a long period of years. There was a constant agitation over the rates of fare. The ink was hardly dry on the signatures of the bill giving the Railroad Commission control over rates when the city filed a petition for a reduction. During the hearings the point was made that the urban lines should bear some proportion of the expense of the unprofitable suburban lines. The position taken by the city of Milwaukee, however, was that it did not care about the suburbs. It wanted a low fare within the city limits. It was willing to let the suburban districts get the service that their traffic would warrant. On the other hand, the suburban residents wanted frequent service at low rates. They declared

that they spent their money in Milwaukee and that the city lines should bear some proportion of the cost of operation of the outlying properties until the districts developed. The result of the complaint was that the city fares were reduced and the suburban fares had to be raised.

One member of the committee had suggested, Mr. Rosecrantz added, that the companies wanted regulation because they feared municipal ownership. He said that this was not feared in Wisconsin. He said that before the period of regulation in Milwaukee the railway was harassed constantly by the city authorities. If a car was not available immediately for some passenger, a resolution would be introduced in the City Council requiring more service on a line. Mr. Rosecrantz asked whether such matters should be determined by revenge or impulse, or by mature judgment. The case should be decided, not by a prejudiced jury but by men who were not subject to local influence. It should be decided by men who could give consideration to the matter and decide what was right or wrong. The object of a public service commission law was to provide a proper, disinterested, able commission to pass upon the differences between the city and the company.

DENSE TRAFFIC ON SAN FRANCISCO LINE

During his testimony Mr. Rosecrantz mentioned the municipal railway in San Francisco. He said that this line had a large amount of travel with a 5-cent fare, that it gave no transfers, and that its results were really those of a line operating in a district of good density of traffic. The average railway company performed a public duty in affording service on unprofitable lines as well as on profitable lines. All the earnings of the system were combined, and the excess from some lines provided reasonable proper service for lines that did not pay. If a municipality or a state operated a railway, the property would not be conducted commercially. When the costs were in excess of the income the difference would be met from taxes. Men who did not use the cars paid for those who did. When a property was owned and operated by a private company any loss was borne by investors and not by taxpayers. Companies went into the enterprise with the idea of efficient service and gain, and no business could be operated unless an incentive was provided.

HOPE FOR THE FUTURE

Many electric railways were unprofitable, the speaker declared, but they were held because of the "eternal" hope that improvement would take place in the future. In Milwaukee residents along the lines of the interurban system had declared that they believed the owners were entitled to a reasonable return and that they would consent to an increase in rates. The interurban lines had been constructed economically, but no part of the interurban system paid 4 per cent on the actual money expended, as determined by the Railroad Commission.

In referring to the Cleveland situation, Mr. Rosecrantz said that the control of operations was not removed sufficiently from local conditions. The old form of regulation under the earlier railroad commissions was not really regulation at all. He believed that if a question could be taken directly to the people it would be found that they were fair. It was difficult, however, to get the people to take enough interest to vote. In Milwaukee it has been found that people would not take the trouble to vote on the question of needed bridges. If a private company had been responsible, the bridges would have been built.

The witness declared that much of the feeling that existed between the public and the electric railway companies was due to the discourteous, discreditable management of some properties. He said that in the early days of railroad construction rights were disregarded, and this created a feeling which was now coming to the surface. In the old days accounts were not kept properly. It took a good deal of courage to say that a large amount should be set aside for depreciation. Bankers wanted dividends. To-day, however, it made no difference what capitalization was outstanding, rates were based upon the actual amount of the investment used and useful for the convenience of the public. They provided for a reasonable return and the up-keep of the property. It had taken a long time to reach this condition.

Mr. Rosecrantz mentioned the welfare work of the Milwaukee system, including the pension provision and the benefit and building and loan associations. He then discussed the question of the public attitude toward municipal ownership, and said that there was not a great public desire for this innovation. He declared that the Milwaukee system was able to furnish better and cheaper service on account of its combination of utilities than if the utilities of each class were operated separately. He described the conditions existing in Superior, Wis., and declared that the threat of municipal ownership made for bad service because the company was not able to raise capital for improvement. He could not see how it would be possible to prevent political corruption if a great property which concerned everyone in the city was placed where every election would affect it. The question affected every utility in the United States and in the world. It was not a question to be decided in an idle moment. The government should control and not serve the public. Everything that was desirable under municipal ownership could be better obtained under regulation without the chance of loss that went with ownership.

SERVICE BETTER UNDER STATE REGULATION

Since the utilities of Wisconsin had been removed from the strife of local politics the people were better satisfied, and the service was better. If a complaint went to the commission, the company made its case and accepted the decision. It had appealed in only one case, the 3-cent fare case. That was on the question of whether or not the Milwaukee franchise constituted a contract.

Mr. Rosecrantz discussed the question of so-called "special privileges." He said that the electric railway had the right to invest its money and to receive a reasonable return that was a small increase over the interest return of a bank or a mortgage rate. It stood all the risk of loss. When it operated under a franchise, it could not discontinue an unprofitable line. Any other business man could always discontinue any part of his business that was unprofitable. It would not be possible to operate a railway more satisfactorily through a man who knew nothing about it than through an employee who had been brought up in the service. It would not be possible for a municipality to get lower fares unless it either operated the company more economically or subsidized it. Public ownership and operation had always been more expensive than private ownership. The employee of a private corporation was paid more than an employee of a public plant, but there were more men than were needed in the public plant.

FRANCHISE WITHOUT LIMITATION

Under present conditions, Mr. Rosecrantz continued, it was hard for honestly managed corporations to get money. It was not a question of the bankers or of

Wall Street, but of the bond buyers who did not buy because they did not know what was going to happen. The question of franchises was brought up. Mr. Rosecrantz said that the best form of franchise for the public was one without any date of expiration. With a limited franchise the company would and must set aside a certain sum from gross receipts for amortization. With a perpetual franchise there was no excuse for a sinking fund of this character. The public wanted to receive the best service for the lowest possible rate. It could not get that if a company was entitled to set aside a fund for retirement of its capital investment because of a maturing franchise.

CITY AND SUBURBAN FARES

Referring again to the issue between the city of Milwaukee and the suburbs, Mr. Rosecrantz declared that the suburbs were interested in the question of fares in the city. If the Railroad Commission of Wisconsin could set aside the Milwaukee franchise and make a lower rate, it could set aside the outlying franchises and make higher rates. He explained the zone system of fares introduced on the outlying lines, the effectiveness of stock and bond regulation by the Wisconsin commission, and the thorough system of accounts established under the law. He said that the basis of regulation was that $2 should not be spent where $1 would perform the service. He thought that the government should not go into anything except governing. No railway or plant could be built in Wisconsin unless it was needed to serve the public.

Mr. Rosecrantz said that he did not pretend to be uttering the last word, but that he had convictions that he wanted to express. He thought that no property should be condemned and taken unless there was taken into consideration in the valuation the fact that it was in place and operated as a going concern. He read extracts from the paper presented by him before the 1913 convention of the American Electric Railway Association on "Other Elements of Value." Some allowance had to be made for intangible value. The price had to assume a transaction in a market where no one was compelled to sell and no one was compelled to buy. It had to be a reasonable market value. In the case of the Washington Railway & Electric Company there was a property in existence pursuant to a direct act of Congress. The act gave the company the right to engage in an undertaking. The right might be taken away, but the property could not be taken away. Part of the value of the property was what the right was worth in the market. Whether the value was called franchise value or something else, there was an element of value for which payment must be made.

Representative Igoe quoted the section of the act which reserved to Congress the right to alter, amend or repeal.

FRANCHISE CONVERTED TO PROPERTY

Mr. Rosecrantz said that having reduced the franchise to use, the company had converted it to property and the value could not be seized. The language quoted by Representative Igoe was the result of the decision in the Dartmouth College case. While this seemed very broad and conclusive, it meant that the right to regulate was preserved. The Supreme Court had said that the alteration, amendment or repeal could not be used so as to destroy property. The change must be reasonable in the case of a public undertaking.

Referring again to the matter of extensions under municipal ownership, Mr. Rosecrantz said that changes were likely to be made to suit the man who had the greatest pull. If the zone system should be introduced, people would save a penny and walk to the nearest fare point. The public would gain nothing, but would lose money by municipal ownership. If the municipality should assume the obligation of the electric railways, it would not stop at that, but would assume others. Private enterprises should be left to private effort.

TESTIMONY OF WILLIAM J. CLARK

William J. Clark referred to his long connection with the electrical industry and the General Electric Company. His testimony was supplemented by discussion of some of the points. An abstract of Mr. Clark's testimony follows:

Foreign governments, with their facilities for securing information and the making of investigations, have been struggling with the problem of public utility ownership and operation for years, and the great economists of the earth, free from capitalistic influence, so called, are likewise giving the subject the most thorough consideration. It is perhaps not generally understood that almost all unbiased economists, other than those of the socialistic school, concede that America has come closer to an effective solution of the problem through private ownership and effective government regulation than has been elsewhere accomplished. True, the perfection of the system has not yet been attained, but within the past few years more has thus been accomplished along sound economic lines than in almost the entire history of public utility development. By means of the American regulatory system it has become possible to continue private ownership with its great advantages of individual initiative, ambition and desire for profit, unhampered by "red tape" and cumbersome methods, all of which tend toward progress and development, and at the same time provide protection for investors and the public against uneconomic or dishonest financial manipulation in the creation and operation of private companies.

On the other hand, the inherent characteristics of public ownership and operation and results therefrom stand as they have for generations, presenting, with rare exceptions, uneconomical illustrations of political influence and manipulation and a lack of initiative, personal effort and desire for efficiency. All these, too, are bound together with "red tape" and conducted under complicated and cumbersome systems, comparatively free from any effective supervision of accounts by any superior authority. Human nature is much the same everywhere and operates similarly with individuals who dictate the policies of governments and companies and those who carry out the practical details of policies, so that the unchecked accounting in particular presents a strong temptation for the manipulation of figures.

OPINIONS OF LEADING MEN

1. The President of the United States. (From his work entitled "The State."):

Society can by no means afford to allow the use for private gain and without regulation of undertakings necessary to its own healthful and efficient operation and yet of a sort to exclude equality in competition. Experience has proved that the self-interest of those who have controlled such undertakings for private gain is not coincident with the public interest; even enlightened self-interest may often discover means of illicit pecuniary advantage in unjust discriminations between individuals in the use of such instrumentalities. But the proposition that the government should control such dominating organizations of capital may by no means wrested to mean by any necessary implication that the government should itself administer those instrumentalities of economic action, which cannot be used except as monopolies. In such cases, as Sir T. H. Farrar says, "there are two great alternatives: (1) ownership and management by private enterprise and capital under regulation by the State, (2) ownership and management by government, central or local." Government regulation may in most cases suffice. Indeed, such are the difficulties in the way of establishing and maintaining careful business management on the part of the government that control ought to be preferred to direct administration in as many cases as possible—in every case in which control without administration can be made effectual.

2. William H. Taft, ex-President of the United States. (From his special message to Congress, Feb. 22, 1912):

This presents the question of government ownership of public utilities, which are now being conducted by private enterprise under franchise from the government. I believe that the true principle is that private enterprises should be permitted to carry on such public utilities under due regulation as to rates by proper authority, rather than that the government should itself conduct them. This principle I favor, because I do not think it in accordance with the best public policy thus greatly to increase the body of public servants. Of course, if it could be shown that telegraph service could be furnished to the public at a less price than it is now furnished by telegraph companies, and with equal efficiency, the argument might be a strong one in favor of the adoption of the proposition. But I am not satisfied from any evidence that if these properties were taken over by the government they could be managed any more economically or any more efficiently, or that this would enable the government to furnish service at any smaller rate than the public is now required to pay by private companies.

3. Theodore Roosevelt, ex-President of the United States. (From his speech at Raleigh, N. C., Oct. 19, 1905):

I do not believe in government ownership of anything which can with propriety be left in private hands, and in particular I should most strenuously object to government ownership of railroads. But I believe with equal firmness that it is out of the question for the government not to exercise a supervisory and regulatory right over the railroads; for it is vital to the well-being of the public that they should be managed in a spirit of fairness and justice toward all the public. Actual experience has shown that it is not possible to leave the railroads uncontrolled.

(From Mr. Roosevelt's speech at Indianapolis, Ind., May 30, 1907):

There has been plenty of dishonest work done by corporations in the past. There will not be the slightest let-up in the effort to hunt down and punish every dishonest man. But the bulk of our business is honestly done. In the natural indignation the people feel over the dishonesty, it is all essential that they should not lose their heads and get drawn into an indiscriminate raid upon all corporations, all people of wealth, whether they do well or ill. Out of any such wild movement good will not come, cannot come and never has come. On the contrary, the surest way to invite reaction is to follow in the lead of either demagogue or visionary in a sweeping assault upon property values and upon public confidence, which would work incalculable damage in the business world, and would produce such distrust of the agitators that in the revulsion the distrust would extend to honest men, who, in sincere and sane fashion, are trying to remedy the evils.

4. Champ Clark, Speaker of the House of Representatives. (From New York *Tribune*, Sunday Magazine, Feb. 2, 1913):

Champ Clark, Speaker of the House of Representatives, once said to a young man from his district: "My boy, you can do better for yourself by going back to the woods at home and mauling rails, than by taking a clerkship under the government; you'll get no job from me."

5. Franklin K. Lane, Secretary of the Interior. (From his article in the New York *Journal of Commerce*, Jan. 3, 1912):

Are we to have government ownership and operation of railways? To this question no one is justified in giving either an affirmative or a negative answer. Those who contend that such ownership is inevitable point to the history of railroads of continental Europe and prophesy that such result is inevitable. When asked why it is necessary their reply is that it is the only solution of the problem that will bring satisfaction and contentment on the part of the people. Certainly this is not true as to railroad "operation," for no one who has experience with governmental affairs will be bold enough to say that the government of the United States could now operate 250,000 miles of railroad with as much satisfaction to the people as those railroads themselves are at present being administered.

What, then, is the necessity for government ownership? The answer is given that through government ownership alone can the railroads be properly subservient to the public welfare. And when asked in what respects the railroads are delinquent as to the public, the answer comes that their rates are too high and their practices are unjustly discriminatory. This answer, it will be seen, carries with it the idea that by some peculiar method of magic rates will become automatically just, reasonable and non-discriminatory by the mere fact that the government owns and operates the carriers. Manifestly such an assumption is absurd. Ownership by the government implies regulation by the government. If to-day all the railroads of this country passed into the possession of the United States and were administered in the most efficient manner possible there would still remain a railroad problem.

What rates should the government charge? What policy should the government pursue? Should rail rates be made to meet water competition? Should higher charges be allowed at intermediate points? Should market competition be permitted as a railroad policy? Should lumber be carried as cheaply as coal? Should rates from and to all points be blanketed under a uniform rate per hundred pounds? Should all articles move under a well-devised system of class rates, or should certain heavy traffic be taken out of the classification and exceptions made so that it will move to distant markets? Should there be any lower rate to or from the ports of export than on local traffic? What should the relation between the rate when applied to a carload and the rate when applied to a hundred pounds? Is it advisable to hold rates down to a mere return upon the present value of property used? Is it right to impose upon certain kinds of traffic a much greater burden than on other kinds because the former is not only of greater value, but because in transporting it the railway renders a greater service? Is it best and wisest that rates shall be so adjusted as to promote the longer haul or so as to develop near-by markets of consumption? Shall we regard our industries as serving only our immediate neighborhood, or as serving the country at large or as serving the world?

These are among the problems that would remain for governmental solution if we had national ownership. Congress or some other authority would be required to deal with them as matters of policy or as matters of justice, and practical men would divide upon them as they are divided now. Germany has not escaped from the perplexing problems of rate-making, rate adjustments and rate policies by the ownership of her own lines, nor has any other country. Doubtless it is easier for a government board to deal directly with a property which the government owns, but no one is as yet justified in saying that regulation by the government is destined to failure or that such regulations will not bring about conditions as satisfactory to the shippers of the country and as beneficial to the nation's progress as would exist if the government owned the lines itself.

As Mr. Sidney Brooks, the English economist, says, we have invented what appears to be practical machinery for such railroad regulation. European countries sought to deal with this problem by blanket legislation and not through administrative tribunals. Their embarrassments accumulated until they sought refuge in what appeared to them to be the only resort—taking the properties in their own hands. The United States, however, realizing the disadvantages that would arise from destroying individual initiative operation and control, and recognizing entirely the right of the public effectively to control these highways, refused to accept government ownership as the only way of escape and instituted a plan of administration based upon policies declared by the national legislature. This is an experiment of which European countries did not have the advantage and which for the present promises well. Whether it is more than a temporary expedient depends to no inconsiderable degree upon the temper and wisdom of the railroads themselves and the judgment of the governmental authorities in whose hands the regulative power is placed. If, however, Congress and the Interstate Commerce Commission fail, what assurance can there be that Congress and some other commission regulating a government system of railroads will succeed? The problem of railroad regulation will always be with us, no matter in whom the ownership of the property used may be vested. And to those who are familiar with the character of the disputes that at present arise between rival communities and rival industries and competing sections of the country there does not seem to be any overwhelming benefit to be gained by throwing such contests into politics.

6. Joint Commission of Senate and House of Representatives on the business method of the post office department and postal service. (From report submitted Feb. 10, 1908):

It appears too obvious to require argument that the most efficient service can never be expected as long as the direction of the business is, as at present, intrusted to a Postmaster-General and certain assistants selected without special reference to experience and qualifications and subject to frequent change. Before the Postmaster-General and his assistants can become reasonably familiar with the operations of the service, they are replaced by others, who, in turn, are called upon to resign before they can, in the nature of things, become qualified by knowledge and experience to perform their allotted tasks. Under such a system a large railroad, commercial or industrial business would inevitably go into bankruptcy, and the Post-office department has averted that fate only because the United States Treasury has been available to meet deficiencies.

7. Sir Thomas Henry Farrer, formerly permanent secretary of the British Board of Trade. (From his testimony before the Royal Commission on Civil Establishments):

20,012.....There is a certain difficulty in the softheartedness of heads of departments and of ministers. But there is a very much greater difficulty in the pressure which is put upon them by members of the House of Commons. That is the real difficulty; the real difficulty of the public service is getting rid of bad men, and the real difficulty of getting rid of bad men is that no minister will face the pressure which is put upon him from the outside.

20,013. (Mr. Hanbury). "Have you had much personal experience of that?"

"Yes, I have, because I have been plagued all my life at the Board of Trade with inefficient men that I wanted to get rid of, but have been unable to do so."

20,014. "Has Parliamentary pressure been your main difficulty in getting rid of them?"

"Parliamentary pressure is the main difficulty."

20,015. (Mr. Harvey). "May we say this, that if the minister puts his foot down the agitation comes to nothing? The difficulty is, I suppose, to get the minister to be willing to provoke the criticism or resentment perhaps, of a large body of members of Parliament?"

"Members are economical in general; but in particular cases they think more of their constituents than of the public service. No doubt with a little thinking I could find a very great number of instances, but two or three occur to me. Not very many years ago there was a clerk of whom perpetual complaints were made to me; he was in a hard-worked department, and the heads of it told me repeatedly, 'We can do nothing with him.' At last we got it arranged that he should go. My back was turned—I was away on a holiday—and when I came back there, I found that Parliamentary pressure, by which I mean applications from members, had been put on; and in spite of us all, the man was back in the place to the detriment of our own credit. Let me mention another case. I was engaged upon a reorganization of the department under one of the strongest men that I have ever

served. What the president said to me in effect was, 'We must have new blood; we are getting crowded up with effete men; I will back you in anything you do, only you must undertake not to get me into a difficulty in the House of Commons. I cannot afford it; the government cannot afford time for it; they cannot afford strength to fight battles of that kind.' We set to work about the reorganization with our hands tied, and we were obliged to say to these men, 'Well, if you stay here we will make it very uncomfortable for you; we will put you in the very worst places in the office.' The treasury offered good terms of retirement, and in that way, after a good deal of fighting, we got rid of most of them."

20,016. (Chairman.) "Did you have to give them abolition terms?"

"Yes, very high terms. I may mention a case which has happened even since then. I refer to the official receivers in bankruptcy. They were men who were appointed only a few days ago under the most stringent conditions imposed by the Treasury and by the Board of Trade. In the first place they were paid by fees, which generally does not give any vested interest; they were told that they were appointed upon trial, that they might be removed at any moment if the Board of Trade desired for the mere good of the service. Fortunately most of them have turned out extremely well. One turned out bad, perhaps more, but one certainly turned out very bad. Perpetual complaints were made to me by the head of that department when I was there that he could do nothing with this man, and that the business was being badly conducted. After a good deal of trouble since I left, it was determined to remove this man. The members of the county, as I am told, came and put pressure upon the president, till he was obliged to say, 'I cannot remove him; he must stay.'"

8. Jonathan Bourne, ex-United States Senator. (From Boston *Evening Transcript*, Dec. 19, 1913):

"Bureaucratic paternalism, dry rot and inside of a century governmental dissolution," are foreseen by former Senator Jonathan Bourne, Jr., as an eventuality of government ownership of telegraph and telephone lines as advocated by Postmaster-General Burleson. Mr. Bourne for six years was a member of the committee on post-offices and post roads, and for two years its chairman, and even now he is engaged as chairman of a special congressional commission in a study of railway mail pay and second-class rates.

Senator Bourne states that he has not a dollar's interest in telephone or telegraph securities and that he is theoretically in favor of government ownership, though practically bitterly opposed to it.

The ex-senator's most startling deduction is that government ownership would result eventually in complete domination of the government by its own employees, who would vote themselves such hours and pay as they chose. Mr. Bourne submits the following figures:

	Number.
1911—Government civil employees	410,332
1912—Telephone employees	221,000
1912—Telegraph employees	40,000
1911—Railway employees	1,669,000
1909—Electric employees	209,729
1904—Water transportation	188,000
1907—Express companies	79,284
Total	2,818,345

Under government ownership and operation there would soon be more than three million governmental employees, Mr. Bourne says. He continues: "Taking into consideration the fact that in the last ten presidential elections the President has been elected by a plurality varying from 7000 plus to a little over 2,500,000, the thought naturally arises that three million governmental employees could absolutely control the government under our political machinery, the tendency being more pay, less service in governmental employment, resulting in resistless efforts on the part of outside labor to secure government employment, because less onerous and more remunerative, with accumulative dissatisfaction and irritation in all private enterprises."

9. Porter J. McCumber, United States Senator. (From *Congressional Record*, Jan. 19, 1914):

It costs the government of the United States fully 100 per cent more to operate any line of business than it costs any private concern to operate a similar line of business. And as the operating expenses must be paid out of the earnings, the cost to the people must again be practically doubled. Therefore, instead of government ownership and operation being a benefit to the people, it is a curse to them and not only adds so much more to their burdens but also deprives them of their lawful opportunities. The fact that the burden is distributed over all the people does not make it less a burden. * * *

Government ownership of railways, followed by government ownership, as it must be, of other public utilities means that the army of employees, organized as they always will be, will become the complete masters of the government but the subservient tool to the interests of this great army. That army will be powerful enough to dictate every policy of government. No man in any district in the United States would be strong enough to make his race as a member of Congress if his ideas of the value of the wages of these government employees did not correspond with their ideas of the worth of their services. Whenever the government puts itself in the position of owner of public utilities it becomes the prey of an organized class of people, which will result in legislation against the mass of the unorganized people of the country.

No one will deny that we cannot expect the same personal interest, the same curtailment of expenses, the same unfailing watchfulness when the government has to pay the bills, as when we must pay them ourselves. Government ownership of railways, telegraph lines and other public utilities means bad service, extravagance and a menace to the rights of all the people.

10. John H. Bankhead, United States Senator. (From Washington *Post*, Dec. 11, 1913):

Senator Bankhead, of Alabama, Chairman of the Senate committee on post offices and post roads, is a pronounced opponent of government ownership.

"I recognize it is the tendency of the times, but it is a dangerous tendency," he said. "I don't want to see the government go into any business that can be transacted as well or better by individual enterprise."

"More serious than the problem of raising the tremendous aggregation of capital that would be required to take over the railroads and telegraph and telephone companies, would be the problem presented by the vast army of government employees that would be created. * * * Their influence as a political factor must be considered."

11. Filippo Turati, member of the Italian Parliament. (From pamphlet of Italian Postal Telegraph Clerk's Association, 1910):

The (telegraph) service will continue on its road to ruin, and the country will endure the losses and the jests. The Ministry of the Post and the Telegraph will then perhaps decide to send its telegraphic functionaries to Canada and Venezuela in order that they may learn there the great progress of the science. * * *

Even the foreign press has occupied itself with this problem [of the telegraph service] laughing at us merrily. The government, on the other hand, has inverted things; pays less for overtime labor; has done even more; paying everyone badly, it has forced the workers to struggle among themselves for this overtime work, and to become "Krumiri" of themselves. And the government is convinced that it will win much in this affair, and will make an excellent speculation. The workers have understood, and everyone knows that the masters have nothing to gain by killing and exhausting the blood of the workers. But the government does not yet understand these elementary matters, does not understand the dangers that accrue to industry from tired and discontented workers, which renders fraud inevitable.

STATISTICS ON GOVERNMENT AND PRIVATE OWNERSHIP

In the public interest the great objective in the creation and operation of public utilities is to secure a maximum of facilities and effective service at a minimum of capital investment and operative cost. The comparative use and extent of public utility facilities is perhaps the best possible evidence as to whether or not the methods followed in their creation and operation are economically sound.

Authorities differ slightly as to the exact line mileage of the world's railways. "Whittaker's Almanac" (a well recognized British authority) gives the total of such mileage in the world as 670,000, of which 255,000 is located in the United States. Many authorities, including statisticians of this government, show the total population of the world's civilized countries to be approximately 1,000,000,000. Therefore, the United States with slightly less than one-tenth of this total population, has approximately two-fifths of the world's entire mileage of railroad lines.

In 1912 the Prussian Minister of Public Works printed an interesting statement in detail of the world's railroad mileage, segregating that owned by governments. It is shown in Table I.

TABLE I—TABLE SHOWING LENGTH OF STATE OWNED AND OTHER RAILWAYS

	Total Mileage	State Owned
Europe	207,432	107,718
America	327,070	12,194
Asia	63,320	36,730
Africa	22,892	13,670
Australia, etc.	19,267	18,032
Grand totals	639,981	188,344

It should be noted from the foregoing that slightly over 70 per cent of the world's entire railroad mileage is privately owned.

Since the comparative cost of creating public utilities is a most important essential in the determination of the net operating results, the fairly incomplete tabulation shown in Table II has been prepared from British Board of Trade figures, published in 1914:

TABLE II—CAPITALIZATION OR COST OF RAILROADS PER MILE OF LINE IN YEARS 1909, 1910 OR 1911

Country or System		Capitalization Per Mile
United States	Private ownership	$63,631
United Kingdom	Private ownership	274,766
Prussia-Hesse	Government ownership	110,727
France	Mixed ownership	141,301
Belgium	Government ownership	197,036
Austria (state lines only)	Government ownership	135,230
Hungary (state lines only)	Government ownership	106,330
Denmark	Government ownership	60,926
German Imperial	Government ownership	160,312
Italy	Government ownership	151,063
Holland (state lines only)	Government ownership	105,764
Sweden (state lines only)	Government ownership	55,285
Switzerland	Government ownership	156,267

Seemingly, the above demonstrates that steam railroads of the United States are not grossly over-capitalized.

Table III is also illuminating as showing the superior railroad facilities existing in this country. The seemingly lower passenger rates in Europe are principally accounted for by the fact that the great bulk of the passenger traffic there is other than first class, the average rate for such class of traffic being higher than in this country where other than first-class traffic is insignificant. European rates of fare are illustrated by Table IV from page 215 of the "World Almanac" for 1914.

Table III—Showing Comparative Statistics for World's Railroads

Countries	Miles of Line per 10,000 Inhabitants	Miles of Track per 10,000 Inhabitants	Population per Square Mile	Miles of Line per 100 Square Miles	Miles of Track per 100 Square Miles	Total Number Freight Cars	Aggregate Capacity of Freight Cars	Freight Car Capacity per 10,000 Inhabitants	Average Receipts per Passenger Mile, Cents	Rate per Ton Mile, Cents
United Kingdom	5.17	8.80	370.8	19.18	32.55	745,348	(1)	....	....	2.31
France	6.35	9.08	189.6	12.04	17.22	319,788	4,159,565	1,059	1.11	1.21
Prussia-Hesse	5.67	8.11	297.0	16.83	24.08	405,900	6,280,260	1,537	0.9	1.24
Entire United States	26.05	28.77	181.8	22.14	31.11	2,071,338	73,137,546	8.093	1.94	0.75

(1) Data not available but capacity small.

According to a report of the Interstate Commerce Commission made in 1912, the railroads of the United States were operated at about 60 per cent of their gross receipts, an exceedingly low percentage in view of the low rates imposed upon them. Their total available net revenue was $1,124,603,490, of which $113,122,509 was expended for taxes, and $1,011,481,981 to pay the interest on their bonded indebtedness, rentals, dividends and betterments and extensions. This sum averaged about 5.73 per cent upon the total capital investment and, as is generally understood, this figure has materially decreased during the past two or three years. Hence, railroad investments are not particularly attractive at present, and railroad maintenance, betterments and expansions are practically, per force, neglected up to the danger point, if not beyond.

Table IV—Showing Rates of Fare on European Railroads

Ownership	Class 1, Cents	Class 2, Cents	Class 3, Cents
Germany (government)	2.73	1.75	1.16
Belgium (government)	2.91	1.98	1.17
France (government)	3.16	2.35	1.53
France (private)	2.48	2.34	1.53
Holland (government)	3.29	2.47	1.65
Holland (private)	3.29	2.47	1.65
Italy (government)	3.60	2.52	1.62
England:			
Great Eastern Railway, min	4.02	3.02	2.01
Great Eastern Railway, max	6.03	4.02	2.01
Southeastern & Chatham Railway	4.02	2.51	2.01

CANADIAN RAILWAYS

According to the 1913 British Board of Trade Report entitled "State Railways, British Possessions and Foreign," the total capital expenditure made by the Dominion government, in connection with the Intercolonial Railway, which it owns and operates, aggregates $94,745,820. Upon this investment no financial return has ever been received. The total gross receipts from operation in 1912 were $10,593,786, but the net earnings, after deducting operating expenses alone, were only $2,750. The Canadian government has an investment of $8,687,727 in the Prince Edward Island Railway, upon which it has always shown a large deficit, amounting for 1910, 1911 and 1912 to $273,393.

The Province of Ontario has invested $17,204,922 in the Temiskaming & Northern Ontario Railway, which it operates. The system has a comparatively large traffic in the cobalt district, yet its net earnings in 1911 were but $387,632, which, it will be noted, is but 2.2 per cent on the capital invested. Until within the last year or so the Province of New Brunswick has owned and operated the New Brunswick & Coal Railway, which has since been leased to the Canadian Pacific Railway. The investment of the province in the property is not stated, but the deficit in its operation during the last two years under government management was $43,379.

CONDITIONS IN FRANCE

The railroad condition in France is so mixed between public and private ownership of the properties, which are mostly operated by private companies, that it is well-nigh impossible to state accurate figures thereon. One striking illustration of government ownership is in connection with the Western system, the management of which was taken over by the government in 1908. In 1912 it was operated at a loss to the extent of $16,000,000, and the government's estimate of a similar deficit for 1913 is $17,350,700.

TELEPHONE AND TELEGRAPH

Now to review the telegraphic facilities of the world and features incident to their utilization.

"Whittaker's Almanac" for 1914 states that the mileage of telegraph lines in the world amounts to 1,360,000, of which 260,000 is in the United States. Another authority sets the miles of wire erected in such lines at 5,444,000. It should be remembered in this connection that with about one-tenth of the civilized population of the world, the United States has almost doubled its proportionate share of operative telegraph wire. According to statistics compiled by the Western Union Telegraph Company, the average number of telegrams sent per capita of population of the United States in 1909 was 10.76, and in all of Europe the similar average was 7.98.

As to the telephone facilities of the world and their utilization, most comprehensive statistics have been prepared by the American Telephone & Telegraph Company. Some of the more important telephone statistics contained therein are shown in Table V. and Table VI.

Table V—Telephone Development of the World, Jan. 1, 1911

Division	Telephones Jan. 1, 1911	Per Cent of Total	Telephones per 100 Population	Population per Square Mile
United States	7,595,938	67.4	8.1	30
Canada	284,373	2.5	3.7	4.7
Europe	2,966,553	26.3	0.7	119
South America	85,744	0.8	0.2	6.5
All other countries	339,285	3.0	0.03	28
Total World	11,271,893	100	0.6	30

POSITION OF THE UNITED STATES IN PUBLIC UTILITY SERVICE

On the basis of the foregoing tables, which could be greatly amplified, the broad assertion can be made that America has more adequate public utility facilities of every description than any other country. Viewed as a whole, the service rendered by American public utilities is superior to that rendered in other countries, while the capital investment and the cost of service are less than in other countries, provided due allowance is made for lower rates of wages and less cost of other essentials to construction and operation.

EXPERIENCE WITH PUBLIC OWNERSHIP IN AMERICA

There has been no lack of experience in regard to public ownership in this country. Certain minor ventures of this character were made as far back as colonial days, but most, if not all, were financial failures. Almost from the formation of our present federal government it has participated in and has at various times undertaken small ventures of this character, independent of subsidies, land grants, etc., to canal, railway and similar companies. Prior to 1860, appropriations to the extent of approximately $12,300,000 had been made by Congress for the construction of governmentally owned transportation projects. If any financial success resulted from their operation it is exceedingly difficult to ascertain such fact.

The ventures of the older states in this same direction have been far more extensive and have possibly resulted much more unfortunately, in a financial way, than have those of the federal government. An instructive volume on this subject alone could be compiled from the records of the older states. Their expenditures for publicly owned and operated canals were almost appalling. For example, the great majority of canal projects outside of New York State have either been abandoned or have been turned over to private ownership. In New York, other than in respect to the incidental advantages secured by internal development, no one would venture to state that the state canals have been other than a gigantic financial failure.

TABLE VI—SHOWING STATISTICS OF EARNINGS (PARTLY ESTIMATED) AND INVESTMENT FOR WORLD TELEPHONES

Division	Gross Earnings (in thousands), 1909	Average Earnings per Telephone, 1909	Investment (in thousands), 1911	Investment per Telephone, 1911	Investment per Capita, 1911
United States	$221,471	$32.87	$956,700	$126	$10.27
Canada	6,752	31.87	36,700	129	4.76
Europe	91,331	35.40	518,377	175	1.18
All other countries	9,163	30.00	50,000	118	....
Total World	$328,717	.....	$1,561,777	$139	....

Certain American states, and even one municipality (Cincinnati) have owned and operated railroads. At present the only American publicly operated railroads are the Panama road, owned by the federal government, and the Short Penitentiary Line, so called, in the State of Texas. Georgia and North Carolina have and still own important railroads that were constructed at comparatively early dates, but these are now leased and operated by private companies. As is shown by the official records, the experience under state operation was most unfortunate financially.

The experience of North Carolina can best be illustrated by quoting from an article by T. B. Womack, formerly Judge of the Supreme Court of that State, published in the *World's Work*, December, 1906:

> It was part of Governor Morehead's dream that North Carolina should have a great through system of railroads, from mountains to seashore. To carry out this idea a charter was obtained for a road from Goldsboro, the eastern terminus of the North Carolina Railroad, to the coast at Morehead City, a place named in honor of the Governor and then considered a great city of the future. The State took 12,000 of the 18,000 shares of stock, appointed a majority of the directors and has had absolute control.
>
> This road has now been operated by the State of North Carolina for nearly half a century, in war and peace, by Democrats, by Republicans and by Fusionists—each with varying degrees of failure. The private stockholders for years have pleaded for a lease or for anything to avoid a continuance of political mismanagement. During these many years no dividend has been earned, though one or two presidents declared dividends of one or two per cent per annum for political effect, when every cent should have been used in betterments. The stock value ranged from ten to twenty-five cents.
>
> Finally, under the administration of Governor Aycock, it became known that the administration had determined to heed the cries of the private stockholders and the sound business judgment of the people of the State, and lease this last of the State's railroads. A great sigh of relief went up from mountains to sea. The lease was not effected until after an attempted sensational receivership in the federal courts and litigation by those who wanted to hold on to the teats. During this litigation many evils of political management were made public, among others, the fact that every administration for years had employed prominent politicians in various sections remote from the railroad as "local counsel," thereby enabling them to receive free passes within the letter, but against the spirit, of the State statute prohibiting free passes.
>
> The effects of the lease were immediate. The first year of private management improved the roadbed and equipment to a point never before approached. The road is being extended and new connections made, and is run upon business, as opposed to political methods. The service, both passenger and freight, has been nearly doubled. Favoritism has been abolished. The stock has advanced to from sixty to seventy cents, and would be higher but for the fact that certain politicians, many of whom participated in making the lease, have instituted litigation in an endeavor to annul it, for want of power and the like.

The experience of the city of Cincinnati, which owns the Cincinnati Southern road, has been similar to that of Georgia and North Carolina. The past experience of Missouri in railroad construction and operation has been still more unfortunate. Indiana, has a similar unfortunate experience with the so-called Madison & Lafayette line, as far back as the later thirties, when after a year's operation it gave the road to a private company and pocketed a loss of $1,500,000. The State of Pennsylvania is said to have lost altogether $20,000,000 in connection with its past ventures in railroad ownership and operation, principally in connection with the old Philadelphia & Columbia Railroad. Concerning this the historian of the Pennsylvania Railroad writes as follows:

> The individual transporter who did not dance when the politicians in charge of traffic piped was placed at a great disadvantage. His cars were not moved until after the cars of his competitor, who was a partisan, reached market; classifications were interpreted against him and his cars were condemned by inspectors; every effort was made to compel his adherence, failing in which he was run out of business or badly crippled. The free-pass system originated on State works and grew out of the assumption by public officials that they had a right to pass over the public highways, in going to and from the capital, free of tolls. County officials soon claimed that they were entitled to the same immunity in going to and from their respective county towns, and political hangers-on * * * enrolled themselves under the banner of free transportation. * * * It became a potent factor in corruption and reached such an extent that transporters who would do certain political work at an election would have their tolls rebated to an extent that nearly always reached a refund of the entire amount paid. The State debt grew and grew until bankruptcy stared the people in the face.

ELECTRICAL INDUSTRY IN AMERICA

The creation of electric central stations began in this country about 1880, and since then their development has been both rapid and extensive. Speaking broadly, we may say that such development has been encouraged by the public and its governing bodies. According to the 1912 census, the average revenue per kw-hr. secured by private companies was 2.40 cents and the cost of its generation 1.98 cents, showing that the companies received an average profit of only 0.42 cent per kw-hr. The revenue secured by the municipal stations averaged 4.22 cents and the cost of its generation was 3.15 cents, leaving a profit of 1.07 cents. It is equally interesting to note that the kilowatt hour output per employee in the company stations averaged 154,008, while the similar figure in the municipal stations was only 67,698. It is generally conceded that the current used for power service is of greater benefit to the public at large than that used for lighting purposes only. Consequently, it should be noted that the capacity of motors operated on private companies' own circuits was approximately 57 per cent of the total primary horse-power installed in such stations, whereas on the municipal circuits the similar figures are but 29.5 per cent.

The growth in all features of the central station industry has been enormous since the first statistics were available in 1902, but the briefest and best manner in which to illustrate this is to state that in 1902 the total output of all the company stations was 2,311,146,676, whereas in 1912 it increased to 10,995,436,276. In 1902 the total municipal plant output was 195,904,439 and in 1912 it was 537,526,730, the total in 1902 being 2,507,051,115 and in 1912 11,532,963,006. The total output of all electric power stations using franchise rights, including electric railways, was not ascertainable until 1907, when the figure was 10,621,406,837. These enormous figures by no means cover the total generation of electric current in this country, for no

complete enumeration has ever been made of what are known as isolated plants operating without franchise rights. Many claim that the total capacity of these plants is nearly as great as that of all the central stations.

ELECTRICAL INDUSTRY IN UNITED KINGDOM

At the outset the British were even more ready than were Americans to furnish capital for the establishment of central stations. In fact, prior to 1883, approximately $80,000,000 had been subscribed as capital for electricity supply companies. Since the period thus referred to British municipalities up to the past few years have been endeavoring to control electric lighting within their respective jurisdictions, with generally unsatisfactory financial results and strangulation of the industry. This last statement is corroborated by a series of resolutions adopted some years since by the British Institution of Electrical Engineering.

Official statistics have been available for a number of years on British electric central stations, but have been compiled upon a different basis than has been done here. The total kilowatt capacity of dynamos installed in all central stations of the United Kingdom in 1907 was 732,748, and in 1912 this had increased by 338,103 to 1,070,851, or approximately 46 per cent. During this same period the kilowatt capacity in the stations of the United States had increased 2,425,384, or at the rate of approximately 89 per cent. The ownership of the British dynamo capacity in the years taken was in 1907, 492,538 municipal, and 240,210 private company. In 1912 municipalities owned 696,673 and companies 374,178. The total plant output in 1912 was but a trifle over 10 per cent of the total central station output in the United States. The total of the output of British central stations and tramway plants in 1912 was 1,784,208,142, which is also about 10 per cent of the similar output in the United States.

In 1912 municipal stations of the United Kingdom developed practically but 3.55 kw-hr. for each dollar of capital invested therein, whereas in the United States the company stations developed approximately 5.23 kw-hr. for each dollar of their investment. The average revenue per kw-hr. secured by all of the British municipal central stations in 1912 was 3.38 cents and its cost was 1.74 cents, so they netted a profit thereon of 1.64 cents. British companies secured a revenue of 4.08 cents per kw-hr., and their cost amounted to 2.32 cents, netting a profit of 1.76 cents.

Since the commencement of the British municipal tramway movement and the electrification of such lines, which was about ten years later than railway electrification was well under way in the United States, municipal central stations were not showing large financial returns. Consequently it was felt that the municipal electrification of tramways would afford most profitable customers for the central stations. This was undoubtedly one of the principal incentives to tramway municipalization. Almost ever since any considerable number of tramway properties became municipalized and electrified, however, most of the municipal tramway managers and others have maintained that the tramways were charged unduly high prices for current to make a better showing for the central stations than they were justly entitled to.

CONCLUSION

Complete statistics upon the great electrical industry as related to the distribution of current for lighting and power purposes or as applied to transportation are not available for the entire world, but it is conceded by all familiar with the industry that the production of electrical machinery and appliances in this country is greater than in all the rest of the world combined. It is also a fact that there is more electrical energy generated in this country than is produced in all other countries, and that the mileage of electric railways in this country is greater than in the remainder of the world.

The development of street and electric railways has been very similar to that of the central stations as described, and as early as in 1888 electrification and expansion of our street railways was being actively undertaken, and by 1896 approximately 90 per cent of the then existing street railway mileage of this country had been electrified. Since then the expansion of mileage and improvement of facilities has been marvelous.

The British history of such development reveals even greater difficulties and obstacles than that described in connection with the central stations, especially as the result of an unlooked for legal interpretation of the tramway act of 1870. Prior to such legal decision having been made almost everyone in the Kingdom supposed that if municipalities ever did take over the tramways it would be as going concerns, for such had previously been the practise as regards all other forms of public utilities. Much had been purchased by the municipalities, but with the fact established that the municipalities could obtain the developed properties at the expiration of their franchises at a normal price, coupled with the fact that they could take advantage of ten years' experience and advancement of the art in this country, a terrific impetus was given to tramway municipalization.

How little the municipalities paid for properties which they acquired and for some of their forms of obsolescence, which have since occurred, is shown in the Parliamentary Return on Tramway and Light Railways for 1912 under the item "Capital expended on construction or purchases of old lines and works now superseded." Its total for the entire Kingdom was the equivalent of $30,331,781, a sum which is not the equivalent of what several American street railway companies have paid for similar purposes.

It is regretted that the total of all such expenditures by the electric railway companies in the United States cannot be ascertained, but whatever their sins of omission and commission may have been, they have never confiscated the property of those who preceded them. In 1912 the net capitalization per mile of track in the United States was $104,851. At the same date the capitalization of British tramways per mile of track was $87,324. Probably no other industries in the world have ever gone through such an experience as to extensive scrapping of apparatus and material to afford better facilities to the public than has been done in connection with the development of American central stations and electric railways, which fact has legitimately increased their capital accounts proportionately.

TESTIMONY OF F. C. HENDERSHOTT

F. C. Hendershott, manager of the Bureau of Education of the New York Edison Company, testified that he appeared at the request of the National Electric Light Association, which desired to be represented because of the importance of the question involved. He outlined the scope of the electrical industry of the country, saying that more electrical machinery was manufactured in the United States than in all the rest of the world combined and that more electric energy was generated in this country than in all other countries of the world combined.

Mr. Hendershott said that he would not have appeared

on behalf of the association had it not been for the fact that the proposal provided for public ownership in the national capital. If the bill should be passed and signed the change which it proposed would be generally accepted as the policy of the party in power; or, if it should be passed without regard to party lines, it would be considered as an expression of national policy.

EDUCATION OF EMPLOYEES

In reply to a question as to the nature of the bureau of education of which he was manager, Mr. Hendershott said that it was formed to educate employees to render a better grade of service. It was not intended to educate the public. There was no doubt that to a certain extent the corporations were to blame for the prejudice against them that existed in some places. Corporations had begun to realize in recent years that there had been mistakes in their attitude toward the public.

It was Mr. Hendershott's opinion that the country would not go far with a system of private ownership and public operation. Where a public utility corporation was an essential monopoly regulation was necessary. The alternatives, the witness thought, were private ownership and management with regulation or government ownership and management. The former was much the better. It would assure a higher degree of efficiency in service.

COMMISSION SHOULD CONTROL

An objection to municipal ownership was the fact that it forced taxpayers to do what they did not want to do. Mr. Hendershott cited an instance of a municipal plant which gave a low rate to a factory and finally reached a point where its plant was worn out and there was no fund for replacement. He mentioned the situation in Cleveland, where a municipal plant had been established to compete with the company system. So long as regulation by State commission was the policy of Ohio a situation like that in Cleveland should be under the control of the commission.

Representative Crosser thought that the remote control of a state commission was less satisfactory than local control.

Mr. Hendershott, continuing, said that the utilities had some customers that were unprofitable. The New York Edison Company had 35,000 of these. He could not concede that regulation would necessarily fail. The commissions stood well. There was no doubt in his mind that when the Interstate Commerce Commission rendered its decision in the railroad rate advance case the public would accept the decision as fair. The railroads would have to accept the decision. The commissions were beginning to establish harmonious relations between themselves and to determine bases on which to build their work of regulation.

COMPLAIN OF SERVICE, NOT RATES

The witness said that he had made an investigation to determine the primary cause of agitation for municipal ownership in a number of cases. In 80 per cent of the cases it was the service, not the rates, against which the public complained. It was not possible to attain perfection under private operation, but there was a greater degree of efficiency than could be secured under public operation. It would be difficult to get rid of unsatisfactory employees under public operation, especially if civil service rules prevailed.

SAFETY AND WELFARE WORK

Mr. Hendershott described the work of the American Museum of Safety and the efforts of private companies to promote safety of employees. He said that the methods of welfare work recommended by the public policy committee of the National Electric Light Association had been adopted by many companies, and that the number that introduced systems for the benefit of employees increased each year. The National Association of Corporation Schools was then mentioned by the witness. The purpose of the movement was the education of employees. In the New York Edison Company the number of daily telephone calls averaged 20,000. This meant 20,000 opportunities each day to make friends or enemies or lukewarm customers. The company believed in training its employees so that they would be courteous in their dealings with the public. Of the 6000 employees in its schools those who came in direct contact with the public attended the schools during the hours when they were paid by the company. The company realized that favorable public sentiment was the most valuable asset it could have.

TESTIMONY OF FREDERIC NICHOLAS

Frederic Nicholas testified that he was connected with different publications of the McGraw Publishing Company, Inc. He was associate editor of the ELECTRIC RAILWAY JOURNAL, associate editor of the *Electrical World* and editor of the *McGraw Electric Railway Manual*. He also had an indirect connection with the *Engineering Record*. He was present at the request of the American Electric Railway Association, of which he was a member.

Representative Cary asked if companies of the kind that were affected by the bill advertised in these papers. The witness replied that they might do so to a very small extent, but that the large body of advertisers were the manufacturers of apparatus.

AN ERA OF REGULATION

Mr. Nicholas said that there were many sharply-marked movement or periods in the business growth of the nation. In earlier years there was an era of railroad construction, when every effort was made by the nation and the various states to induce those who had capital to invest in railroad development. In the lighting industry the use of electrical energy had followed gas. With the street railways the horse car had been succeeded in many cities by the cable car and later by the electric car. The present was an era of regulation. He was very glad to have an opportunity to discuss the subject before the committee. The present relations of the public utilities and the public were those of private ownership with complete public regulation. Although regulation was of long standing in Massachusetts, it had been adopted by other states only within comparatively recent years. The best known of the later regulative laws were those of Wisconsin and New York. Laws in other states had followed rapidly until at the present time about thirty states had commissions holding generally broad powers of regulation. The states were making a serious attempt to perfect methods of regulation that would give adequate protection to the public and would attract capital investment. The list of commissions would be increased by the addition of more states in the near future.

PRIVATE OWNERSHIP WITH PUBLIC REGULATION

Mr. Nicholas added that the policy of private ownership with complete public regulation should give fair protection to both company and consumer. In trying to express in a few words the principles that underlie regulation he said he did not of course assume to speak for the policy of any individual commission or to read into the laws or policy of any commission anything that was not there. As he saw it, regulation was an effort to

retain the advantages of initiative and enterprise which private ownership and management fostered, and to introduce a rigid state control in order that there might not be excessive exactions on the part of the public or financial abuses or inadequate or discriminatory service on the part of the company. It was, in theory, a kind of a partnership relation between the company and the consuming public, but with the public released from the responsibility that rested on a partner. It was a purpose to substitute for the loose relation of the past a definite control which gave to the state the rate-making power and the control of service conditions within the reasonable limitations provided by the constitution. Fairly directed, it would protect the company from the public and protect the public from the company.

Continuing, Mr. Nicholas said that the country was passing through a period during which it was adjusting itself to the new conditions. There had been companies that had abused the entire freedom of action which they enjoyed in the past. There had been cities in which undue exactions had been imposed upon the companies. The modern policy of state regulation provided a new platform upon which both interests could stand to work out a better relationship for the future. In the judgment of the witness the public interest would be served if both sides united to give this policy a fair test. A fair test could be assured only if all corporate dissatisfaction and movements toward public ownership were deferred until the possibilities of this policy as a permanent feature in the government could be determined. Any departures that were made from this policy now would weaken the conditions of the trial.

WITHHOLDING ANOTHER CHANGE

The country came to the point where it was perfectly clear that private ownership without public regulation of utilities which are natural monopolies was not in the public interest. An advance was made then to the era of regulation. In the opinion of Mr. Nicholas it was not time to pass judgment upon that policy. The commissions to which power had been given and upon which hopes had been based could not conduct their work successfully and determine fairly the workability of the laws unless they were given time and were supported in their acts. It was not a matter of letting well enough alone to give the commissions time and opportunity to test the laws. It was a matter of withholding another change until it was justified by fair regard for all of the interests concerned. There was still a feeling of intolerance of regulation on the part of some corporation officials. There was a feeling of impatience on the part of some elements of the public. Either one of these feelings, if not curbed, would be fatal to the policy of regulation.

In a discussion of this subject, Mr. Nicholas added, a reference to the public was generally taken as meaning the consuming public. There was, however, another element of the public whose interests should be considered. This was the security holding public. In the main the present security holding public had been as innocent of knowledge of the abuses of corporations which the policy of state regulation was designed to prevent as the consuming public itself. Security holders had suffered as much as consumers from those practices which state regulation was overcoming. Their interests should not be lost to sight now.

SECURITY HOLDERS' POSITION

Without regard to the previous financial history of the properties their securities in the main, the witness said, were in the hands of those who paid fair value. They bought in the expectation of continuing working relations between a company and the municipality served and without any idea that their interests would not receive reasonable protection. Of course, where there had been undue exploitation of a property it could scarcely be expected that any plan for the full protection of the unfortunate security holders could be worked out. Where, however, there had been a normal development of the property, conducted with due regard to the proprieties of corporate accounting and management, every effort should be made by all interests to perfect a scheme which would give reasonable protection to the securities. It was not just that the community should have all the benefits of the development of the art, which had been revolutionary, and escape all of the responsibility for the cost of this development. If the state commissions would, they could do much to work out a basis of permanent satisfactory settlement. In the case of the International Railway Company, of Buffalo, the New York Public Service Commission of the Second District, which had before it a plan for reorganization of the property, directed the gradual amortization of underlying bonds amounting to $12,651,500. The cost which this sum represented was considered by the commission as a part of the fair cost of developing the property.

In conclusion Mr. Nicholas urged that commission regulation, fairly directed under strong laws, offered a satisfactory and wholesome solution of the problem.

BULK OF LAWS FAIR AND STRONG

In reply to a question from one of the members of the committee concerning the effect of regulation on the New York, New Haven & Hartford Railroad, the witness said that while he was not familiar with the details he understood that this company was not incorporated under Massachusetts laws and therefore had not been regulated by the Massachusetts commission. A question was asked in reference to the reported employment by the New Haven company of a man to draft a commission law. The witness said that he could not express an opinion on such a measure unless it was before him. He added that he had understood that in the drafting of the Illinois law professors of the University of Illinois were consulted and he supposed that it was the practice to get information wherever it was available. The bulk of the public service commission laws were fair and strong.

Another member of the committee spoke of the relative merits of state and local regulation. Mr. Nicholas said that he believed in state regulation. He thought that the states could legislate with fair regard for the rights of the cities within their borders just as the national government could legislate with fair regard for the interests of the states which composed it.

In replying to a question from one of the members of the committee bearing upon the intensity of the desire of public utility corporations for regulation Mr. Nicholas said that he could not speak for the companies. He could give only his own opinion, which was that the best utilities did not seek what was inconsistent with the public interest.

The first exhibit of the Panama-Pacific International Exposition, a 500-hp. Diesel engine, manufactured by the Busch-Sulzer Brothers Company of St. Louis, was installed in the Palace of Machinery of the Panama-Pacific Exposition on May 27. State and city officials and executives of the exposition participated in the ceremonies. The engine will be used at present in the work of construction which is now nearing completion. Miss Heger, daughter of W. S. Heger, Pacific Coast manager of the Busch-Sulzer company, pulled the lever which set the engine in motion.

Convention of the Southwestern Electrical & Gas Association

Completing the Account of That Part of the Proceedings of the Galveston Meeting Having Bearing on Electric Railway Work Begun in Last Week's Issue

As stated in the ELECTRIC RAILWAY JOURNAL last week, the tenth annual convention of the Southwestern Electrical & Gas Association was held at Hotel Galvez, Galveston, Tex., from May 20 to 23. The program arrangement provided various parallel sessions during the four-day meeting, most of the time of the convention being devoted to the discussion of practical organization, commercial and operating problems.

G. H. Clifford, of Ft. Worth, Tex., president of the association, presided. He explained, in his opening address, that as general technical topics are well covered in the engineering journals and in the transactions of the national scientific and engineering societies, state and sectional associations may best profit from the discussion of local problems. He recommended that the association hold mid-winter meetings in addition to the present annual conventions. His proposal was well received.

The attendance at the Galveston meeting numbered 350. The delegates were welcomed to "the Atlantic City of the Southwest" by Morris Stern of the Galveston Commercial Association. W. L. Wood, Jr., Texarkana, Ark., responded to the welcome on behalf of the association.

President Clifford then announced the following committees: On the president's address—R. B. Stichter, Dallas, Tex.; F. G. Murphy, Brownwood, Tex., and J. C. Kennedy, Brenham, Tex. Finance—J. P. Griffin, Dallas, Tex., chairman. Resolutions—C. W. Kellogg, Dallas, Tex.; W. B. Head, Dallas, Tex., and E. J. Emerson, Beaumont, Tex. Nominating committee—E. T. Moore, Dallas, Tex.; F. Lege, Jr., Galveston, Tex.; F. R. Slater, Dallas, Tex.; John Carpenter, Corsicana, Tex., and T. T. Malone, Plainview, Tex.

ELECTION OF OFFICERS

Saturday's session was given over to business discussion, and the following officers were unanimously elected: President, D. G. Fisher, Dallas; first vice-president, W. L. Wood, Jr., Texarkana; second vice-president, C. W. Kellogg, Jr., Dallas; third vice-president, F. R. Slater, Dallas; secretary, H. S. Cooper, Dallas; treasurer, J. B. Walker, San Angelo.

Executive committee—G. H. Clifford, D. G. Fisher, W. L. Wood, C. W. Kellogg, W. B. Tuttle, D. Daly, F. J. Storm, W. B. Head, H. C. Morris and F. R. Slater.

Advisory committee—W. S. Rathell, W. A. Sullivan, F. G. Murphy, E. D. Kelly, A. W. Wallace, F. A. White, E. S. Fletcher, J. W. Carpenter, M. J. Loftus, J. E. Cowles, W. V. Wainwright, W. A. Guthrie, P. A. Rogers, R. Merriwether, R. C. Brooks, J. L. Stevenson, E. J. Emerson and V. W. Berry.

Finance committee—H. S. Potter, G. W. Cushman and C. E. Calder.

SECRETARY'S REPORT

The report of the secretary, H. S. Cooper, showed that the membership of the association now comprises every operative interurban railway in the State of Texas, every street railway of importance, with one exception, in the State, and all of the important electric light, power and gas plants. He explained the efforts which have been made to render the secretary's office more useful to the membership, and stated that since the last convention more than 150 inquiries had been received from its own members and a number from non-members. This has required the writing of more than 1100 individual letters, besides other correspondence. Among the topics considered which are of interest in electric railway work were: agreements with labor unions, uniform accounting, rights-of-way for pole line, assessment of tracks, street-car advertising rates, rule-books for street railways, taxation of public utilities in Texas, strap hangers in cars, carrying packages on passenger cars, liability insurance, fire insurance, depreciation charges, bonding track, live grounds, electrolysis, use of crude oil in internal combustion engines, speed of street cars, paving tracks in city streets, creosoting poles and ties, power factors, load factors, stokers for burning lignite, track-oiling cans, and joint occupancy of poles.

ECONOMY IN THE USE OF POWER IN STREET RAILWAY SERVICE

In the paper entitled as above, George G. Morse, superintendent of railways, El Paso Electric Railway Company, described the success of his company in using energy meters on the cars. Watt-hour meters were placed on cars in December, 1911. Mr. Morse explained that the energy used per car mile and per 1000 passengers formed the basis of comparison of the performance of different motormen. He insisted that the success of any method depends upon the manner in which individual men are followed up in connection with their records. The plan followed was this: on installing the meters the cars were classified as to weight and motor capacity.

Test runs were made on each line with each class of cars, and certain figures were determined to form a basic rating for different classes and lines.

Records of the performances of all motormen were furnished to the inspectors within twenty-four hours of the completion of the work, and with these the inspectors were able to take up with the motormen the causes for excessive energy consumption while the matter was still fresh in their minds. Complete performance sheets for each line and each class of car were prepared and the men were rated according to their records. By fostering a spirit of friendly rivalry among the men it was soon possible to cut down the basic energy consumption.

Among the advantages which have resulted from the use of the plan were the direct saving of energy, the more intelligent use of the apparatus by the men, the spirit of friendly rivalry produced among the men, and more careful use and inspection of equipment.

The energy saving is shown in the following table:

Average kw-hr. per car mile in 1911 without meters	2.61
Average kw-hr. per car mile in 1912 with meters	2.39
Saving per car mile, 1912 over 1911	.22
Total miles, 1912	1,423,104
Total saving, 1912	313,083 kw-hr.
Average kw-hr. per car mile in 1913	2.41
Saving per car mile, 1913 over 1911	.20
Total miles, 1913	1,582,801
Total saving, 1913	316,560 kw-hr.
Total saving two years' operation	629,643 kw-hr.

In comparing the figures given above it should be remembered that there was no particular change in service conditions after the meters were put in. The number of passengers handled per car mile averaged seven for three years and varied only between 6.9 and 7.1. Somewhat more mileage was made by double-truck cars in 1913, making this year's service a little more severe. Mr. Morse's belief is that operation for two years under the present system has demonstrated a saving sufficient to justify the expense. He believes that railway companies should check energy consumption as carefully as they now check other details of the business.

In the discussion of Mr. Morse's paper E. J. Emerson, Beaumont, Tex., reported reducing the energy consumption on his line from 2.8 kw-hr. to 2.02 kw-hr. by applying watt-hour meters to the cars. E. E. Nelson, Fort Worth, Tex., pointed out the advantages of coasting-time recorders over the watt-hour meter method, and reported obtaining an immediate saving of 19 per cent of energy through the use of the former device. The coasting-time recorder, is, however, open to the objection that it takes no cognizance of operation on the series points of the controller. The motormen also failed to show interest in or understanding of these devices. Such a recorder is more easily checked than a meter, since the observer need only get on the car with a watch.

C. W. Kellogg said that in El Paso, Tex., the Sangamo mercury-type meters used had proven entirely successful, although the formation of a mercury salt has been found with time to introduce friction into the instruments so affected. H. S. Cooper, Dallas, Tex., said that the first test, made at Schenectady, N. Y., with a watt-hour meter on a street car resulted in reduced accuracy of the meter caused by the jolting it experienced. In the city on level track, said Mr. Cooper, it is important to give credit for operation on the series positions, although a coasting clock might be well adapted for interurban cars with heavy rolling stock and steep grades.

DISCUSSION ON ELECTRIC RAILWAY TOPICS

Following the discussion on Mr. Morse's paper several general topics were presented for discussion. A digest of the resulting contributions is given below.

COMPETITION BY MOTOR BUSES

H. S. Cooper, Dallas, Tex., opened the discussion on the subject of competition by motor buses and quoted from a Dallas newspaper voicing the protest of citizens against the use of the heavy gasoline-propelled vehicles now employed in that city. The buses were declared to be noisy, dangerous to pedestrians and children, and extremely destructive to the pavement. New York engineers who have made a study of London's traffic conditions, said Mr. Cooper, have found that the streets of the British metropolis are badly congested by the use of motor trucks, which have increased the number of accidents and involved heavy expenses for paving repairs. The average life of a motor bus is six years. The Dallas bus company has no franchise and claims that none is necessary for the operation of its vehicles.

R. Merriwether, Dallas, said that the Dallas bus line is now doing a pretty good business, and hauls half as many passengers as the street-car line with which it competes. Many persons first rode on the new line as a novelty, but the buses have an advantage over the street cars in that stops are made at any place to take on passengers, drawing up to the curb if necessary. Recently, however, the buses have suffered engine breakdowns caused by abuse by inexperienced operators. On one day, for example, two of the three buses were in the shop and the third was withdrawn from its route. The buses have also become stalled on the hills and grades, requiring passengers to alight and board street cars. The bus company furnishes no proportion of the street paving as does the street railway; indeed the buses operate on the paving laid by the railway company.

E. J. Emerson, Beaumont, Tex., said that another bus company had attempted to operate a line in Dallas several years ago, but this proved a failure after a few weeks of service.

John Benham, Chicago, recounted the experience with the buses which were put on to connect the Chicago west side railway stations with the department stores on State Street. At first a five-cent fare was charged and the buses were crowded, but the receipts did not pay expenses. Later the fare was raised to ten cents, but patronage rapidly waned under the competition of the street cars operated on the same thoroughfare, and the buses were finally withdrawn altogether.

WOOD-BLOCK PAVING

The discussion on wood-block paving was opened by H. S. Cooper, Dallas, Tex., who read from the question box the digest of answers received in reply to inquiries sent out by the secretary's office. These answers are abstracted as follows:

R. Merriwether, Dallas, Tex., described the method recently adopted by his company in laying wood-block paving. The sand laid on the concrete base is mixed with a small quantity of cement, sufficient to cause it to stand up under the "crown" form given it. The blocks are then laid on this cushion, and the joints filled with pitch to permit free expansion.

H. T. Edgar, Boston, Mass., said that despite the heavy grades and rainy weather encountered in Seattle, wood-block paving has there been proved safer than asphalt.

H. B. Sewall, Houston, Tex., reported trouble with the creosote "bleeding" out of the impregnated blocks under the hot sun.

R. T. Sullivan, Houston, Tex., described the two methods used in laying wood-block pavement in Houston, and declared that after service of four or five years no repairs were needed.

John A. Walker, San Angelo, Tex., explained how the sun "boils" the creosote out of the pores of the wood blocks, and later rain and moisture enter the blocks, causing them to swell, "rise," etc.

SINGLE-CAR VERSUS TRAILER OPERATION

In discussing single-car versus trailer operation, R. T. Sullivan, Houston, Tex., spoke of the excellent results obtained with trailer operation at Houston during peaks in the local passenger service. These trailers permit a reduced number of men to be carried over the peaks and also require a smaller number of units in service. No trouble is experienced in making schedule time with trail-car trains. It is now planned to employ trains of two motorcars each, equipped with multiple-unit control. Combination "conductor motormen" are now being trained for service on the second cars, which will be attached during rush-hour periods. Acting as motormen these men will run the cars from the carhouse to the points of coupling behind the regular cars, and will then serve as conductors during multiple-unit operation, later returning their cars to the carhouse at the close of the rush hour. Two-motorcar trains will avoid the objection made to trailer operation by which the motors cannot be operated at their points of highest efficiency under both single car and trailer con-

ditions. Few accidents have occurred with the trailer-car trains used at Houston.

G. H. Clifford, Fort Worth, said that trailer-car trains have been employed with satisfaction in Fort Worth, but that in the future it is planned to operate multiple-unit trains of two motorcars each.

NEAR-SIDE AND FAR-SIDE STOPS

In comparing the advantages of near-side and far-side stops, R. Merriwether said that after two months of experience with the near-side stop at Dallas in obedience to a city ordinance, he feels that it presents no disadvantages in operation, although he added that he would advise discouraging any agitation for a change to it from far-side operation. While the near-side plan cuts out many stops, he expressed doubt whether it would reduce accidents. With the near-side stop in use, drivers of vehicles on cross streets too often assume that the street car is going to stop anyway, and so attempt to cross ahead of it. If the car does not stop, an accident may result. At the time the near-side stop was proposed for Dallas, Mr. Merriwether wrote to twenty operating companies asking their opinions of the plan, and two-thirds of the replies received favored it.

R. T. Sullivan said that in Houston, despite liberal advertising to acquaint the public with the near-side plan, the near-side stop has resulted in many delays which offset any saving in time made by cutting out stops. Local merchants whose stores were not favored by the change in stopping places have complicated the situation by appealing to the city council to amend the recent ordinance.

H. S. Cooper, Dallas, Tex., pointed out the danger to passengers while approaching or leaving the car. Use of front-entrance cars in near-side operation would, however, be practically equivalent to a return to the original condition of far-side stops.

C. W. Kellogg said that in Texas the race-separation requirements have practically precluded the use of front-entrance cars.

SAFEGUARDING THE STEPS

R. T. Sullivan said that the use of small wheels on cars is directly related to the matter of step heights, and he reported that one of the large manufacturers is now ready with a compactly built motor which will make possible lower steps.

R. Merriwether declared that in the experience of his company the closed door and folding step have practically eliminated step accidents. All cars of the Dallas system are to be thus equipped.

C. W. Kellogg, in comparing the relative advantages of gate and door closures, added the comment that gates are chiefly applicable in climates where the cars do not need to be heated. The doors can be fitted with lower glass panes, if desired.

P. L. King, San Antonio, Tex., mentioned an unusual accident in which a man had his finger crushed by thoughtlessly resting his hand on the top of the door just as the conductor closed it. The folding step, he added, has produced a new type of accident. If the step is not seated firmly when a passenger steps upon it, a slight noise is made as it settles under the passenger's weight. At this sound, some nervous women passengers have supposed the car was about to start and in attempting to move quickly, have fallen.

R. T. Sullivan declared that his conductors seemed to prefer closed-door cars even to more desirable runs, despite the extra work involved. When the door is closed, he explained, they feel that their sense of responsibility is at an end, and that they need watch the step no more until the next stop.

P. W. Gerhardt, Dallas, Tex., also added his own testimony that men will give up better runs to operate cars equipped with gates or fare boxes. Gates should open outward so that when closed, passengers will be pushed into rather than out of the car.

W. A. Sullivan, Shreveport, La., described the method followed in flagging at railroad crossings. Closing the rear doors the conductor removes the operating levers and carries them with him through the car to the front exit, from which he drops to the ground.

D. A. Hegarty, Houston, Tex., described the delay which was experienced with the use of release switches.

The question box contained a number of topics of special interest to electric railway men. The replies to the most important of these will be published in a latter issue.

OTHER CONVENTION TOPICS OF RAILWAY INTEREST

At the electric light session of Thursday morning, W. L. Wood, Jr., presiding, H. T. Edgar, of the Stone & Webster Corporation, Boston, Mass., read a paper outlining the extent of energy transmission and distribution from the great Keokuk, Iowa, water-power plant.

On Friday morning Homer R. Mitchell, Dallas, delivered an address on the Texas Employers' Insurance Association which was created by the recent Texas employers' liability act to insure employers at cost. The plan is modeled after that of the Massachusetts statute, and the operation of the law, declared Mr. Mitchell, has been attended by savings for both employers and men.

In his address at the "Safety-First" session of Friday afternoon, W. L. Wood, Jr., Texarkana, Tex., made an appeal for better fire-prevention methods in utility properties, through the protection of plants and equipment from hazards both external and internal.

ENTERTAINMENT FEATURES AND JOVIAN EVENTS

An opening reception and ball, a card party, boat rides, fishing expeditions and bathing parties were features of the entertainment program of the convention.

On Friday evening the Jovian Order held its parade, rejuvenation and banquet. Visiting Jovians and others were frank in conceding this procession and initiation ceremony to be the most elaborate and handsomely staged of their kind ever attempted anywhere in the United States. Five huge electric trucks carried floats depicting the evolution of the lighting art, the development of electrical inventions, the apotheosis of Jovianism, etc. Not only were the floats themselves elaborately illuminated, but cables from the truck batteries led to 160 banners, each carried by a red-clad marcher and lighted by eight 11-volt, 5-watt sign lamps in series on the 90-volt battery circuits. In all some 2000 battery-fed incandescent lamps were in service during the parade which measured five city blocks in length. The parade, rejuvenation and electrical effects were arranged by the local Jovians led by W. R. Phipps, Claude Matthews, K. E. Mason, W. D. Masterson, Max Levy, J. B. Harris and A. E. Kirk. At the banquet which followed the rejuvenation, Past-Jupiter H. B. Kirkland, Pittsburgh, Pa., was toastmaster and there were addresses by Jupiter W. N. Matthews, St. Louis, Mo.; W. B. Head, Dallas, Tex.; F. R. Slater, Dallas, Tex., and Max Levy, Galveston, Tex.

Employees of the Salt Lake & Ogden Railway Company had an outing on May 16 at Lagoon Resort, which is on the company's lines. The day was spent in outdoor sports of all kinds, including a baseball game between the train service employees and the office force, which was won by the former.

Publicity for Electric Railways

The Writer Cites Cases Where Publicity Has Been Unsuccessful in Eliminating Trouble—He Then Discusses Different Kinds of Publicity Service and Gives Suggestions Upon Those Which He Considers the Most Effective

BY W. T. BUCHANAN, PUBLICITY MANAGER PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

Someone has defined publicity—in its modern application—to be the act of telling the facts as they exist for the purpose of securing favorable consideration on the part of the public. In other words, it is asserted that truth telling is publicity, and that falsehood and deception are not publicity, although it would seem that falsehoods have seven-league boots and truth the pace of a snail.

It is conceded that where results are measured by a mental process, acquired by analysis of a theory, writers and publicity doctors are permitted to revel in words to their own supreme enjoyment largely without fear of being controverted.

The "science of publicity" has not yet been defined with any sort of mathematical nicety. There are all kinds of theories, and it would seem that there is just as much divergence of opinion upon this present-day theme as there has been in Scotland over the theory of infant damnation. It is a notable fact that the public as a whole has never been united upon the tariff question. There are still believers of the "16 to 1" theory, and the "nebula hypothesis" furnishes volumes upon volumes for the man who loves to revel in the mire of words.

It has been suggested that what the public utilities of the country need is a national publicity campaign, fostered by a national association and with plenty of means to pay the bills. What is to constitute the national campaign? What of its character? Its methods? Will it be advertisements similar to those presented daily by the American Telephone & Telegraph Company, or such a campaign as was conducted by the Sugar Trust some time ago? Or is to be a series of articles in the magazines?

True it is that there are instances where publicity of a given cause has been conducted to an advantage when the fundamental facts justify the application, but in the world of publicity there are more failures than successes. The writer is not going into the question of the "publicity of sales" but will define his views of the "publicity of acts performed" and in particular "of policy" as applied to a public utility corporation.

IS THE TRUTH ALWAYS CONVINCING?

One writer, who has given the matter deep meditation and writes with freedom, presents a solution—his solution, however—for all of the ills that beset the public utility cause. His cure-all is to tell the truth. But will the truth do it? Let us see how the truth works out. In Detroit they sell seven tickets for 25 cents. The campaign against this iniquitous measure, as conducted, consisted of half pages in the newspapers, literature by the barrel and arguments before all manner of clubs—every bit of which was truth telling. What was the result? The truth did not even make a dent into the cranium of Mr. Public of Detroit. In Cleveland, all manner of publicity has been given to the street railway situation, before the measure passed and since. Has anyone discovered a desire on the part of the Cleveland people to recant? Not that you can notice perceptibly.

In Toledo, truth telling was spread broadcast through the press. Big paid advertisements told the public the facts and thousands of dollars were expended in a campaign of education. It was conducted along broad lines, ably written, and yet what was the result? The city has gone right along with its apparent determination to force confiscation of the street railway property.

Milwaukee is another case where truth telling was flaunted in big advertisements before the public. Had it not been for the State Railroad Commission it is doubtful if even the present result would have been obtained—which, by the way, is a reduction over what was extant previous to the agitation.

Seattle is still another case where big "ads" are being placed prominently before the public. Economic truths regarding public operation are presented in the newspapers daily and have been for a year or more. Has anyone noticed any change in the public policy of Seattle? Not that you are aware of.

Los Angeles is another instance where the power and light companies have been fighting the establishment of a municipal distribution system. Thousands and thousands of dollars have been expended in telling the truth. The proposed bond issue was defeated a year ago, but only by a narrow margin and due to the requirement of the city charter—that three-fourths of all votes cast at the election was necessary to carry. The truth-telling campaign apparently had no effect.

Denver is another instance of truth-telling advertisements; San Francisco has had an experience, Kansas City had another, and so on down the list. There are plenty of them. Almost universally—in the cities where advertising campaigns have been conducted against a proposed restrictive measure—the result has been a failure.

In fact, the writer is ready to make the statement that in nine-tenths of the cities of the country where "truth telling" has been indulged in by means of big advertisements nothing has been accomplished.

THE TROUBLE USUALLY DUE TO NEGLECTED COMPLAINTS

Why do these "truth-telling" campaigns fail? It is evident, where an examination has been made of the various factors involved, that each particular situation is the outgrowth of years of controversy. Some day in the dim past the agitation started from a trifling incident which might have been adjusted without any great amount of difficulty. Experienced managers who have spent a lifetime in the business declare that 90 per cent of the present difficulties are the growth of neglected complaints—that if the complaint had been taken in time and adjusted that the agitation would have never gained the momentum which it later attained. And yet back of it all is the fundamental fact that the public utility is a political issue in every community.

And this gets us back to the proper analysis of public utility corporation publicity. It is my conviction that in the main the publicity involved is of a local character—not territorial or national to any large degree. Take any corporation, and its chief difficulty lies with the local controlling bodies, the city council, the newspapers, the improvement clubs and the legis-

lature, but mainly the local legislative body. The council decides to reduce the fare, provide seats for all, regulate the service, demand extensions—all these are purely local and affect the gross earnings. The national aspect of the situation is intermingled with the railway and industrial corporation strife which is rampant in the country at the present time. The local company, of course, is involved in this to the extent of its proportion of the whole industry. But the company's difficulties are in the main local—90 per cent of them. The action of Congress, the views of statesmen, the European municipal ownership situation have all a bearing, but distinctively minor compared with the troubles of the local field.

What are the chief factors involved in the local situation? First, the local legislative body; second, the newspapers; third, the improvement clubs; fourth, the reformer and politician.

What should be done in each of the above factors where trouble arises is only to be determined when the facts are known, but the most important feature is that the difficulty be immediately adjusted before it has a chance to secure sufficient momentum to be dangerous. Explanations should be made, liberal treatment extended and a hearty co-operation manifested. It is unnecessary to go into details of what should be printed in the newspapers regarding the incident, of what should be the character of the presentation before the city council or what should be said to the improvement club. All these are mere details which have been gone over time and time again, but out of it all comes this "writing upon the wall." Attend to it at once and see that the facts are early presented and do not wait until the mind of the public is made up upon a statement of alleged facts presented by the opposition. Get to the public first and early in the game.

In answer to the above will come the cry of those who are deep in difficulties seemingly insurmountable. What of the company threatened with municipal ownership; with a physical valuation which will wipe out much of its stock, and with a review of its financial operations? Are not these national questions worthy of national publicity? It is not the writer's purpose, even if he could, to present the cure of these very important ills. The national aspect of the situation is not one which will lend itself to publicity with any great amount of ease. Take the American Telephone & Telegraph Company. Its publicity campaign every year must cost a million dollars or more. Has anyone noticed that any headway is being made against the attitude of the government? If judgment is to be given as to the situation it would be that the government is gaining ground in its apparent intention to absorb a telephone system.

THE RAILWAYS AND THE POLITICIANS

Why is it that the public is so chary of believing what the public utility corporation has to say upon any subject? Usually the answer is that it is due to the experience of the public with the company in the past. But while this is possibly true, it is the judgment of many that the real reason is that the public utility in America is a political question. Corporations have been the politician's chief instrument to push him into office for years. He has foamed at the mouth, roared at the public and held his hands up in holy horror when describing the acts of the corporations as against the interests of the people. As a result the public has been educated to accept the utility as a political issue—the same as he does the City Hall or anything pertaining to it. If the city owns the water works it is a part of the political machinery, to be involved as the time warrants its use in discussions to gain the end coveted—the job. So long as this condition exists so long will the publicity campaigns of truth telling, of direct methods and of indirect methods, be thwarted. The railways of the country—from the voter's standpoint—are a political issue. They are not regarded as a commercial enterprise by the politician. His viewpoint is one of political aggrandizement. What of the efforts of the railways of the country—organized and otherwise—along publicity lines during the past fifteen years to gain a respectful hearing and an honest consideration of the facts? Has any headway been made by the railways? If they get the 5 per cent increase now being asked, it will be the first instance of successful publicity in a national campaign.

The writer is aware that he is stepping upon dangerous ground and that he will find many who will disagree with him, particularly those who in their mind's eye see a strong organization perfected for the expenditure of a large sum of money in a national campaign. It may be that the writer's views are not within the scope of the facts, but whatever may be the situation the views expressed are the result of observations and experience sifting through a somewhat ordinary mentality.

THE RIGHT KIND OF PUBLICITY WILL WIN

It is not to be understood that the writer does not believe in publicity, for he does. He believes in the game of taking care of each day as it comes and of each incident as it appears upon the surface—local as well as national. He believes that it is better for the company to be out of the newspapers than in, but in so believing asserts that it is essential to be in when the incident arises and the circumstance warrants it. But to become a leader in a discussion, to take a hand in local and national affairs upon every possible occasion, for its officers to be interviewed frequently and present economic "truths," is all harmful and only prepares the way for a debate which usually ends to the injury of the corporation—along certain lines.

It must be conceded that organized publicity has not been effective in the public utility field when exploiting "policy." The advertising of appliances and commodities is another matter and has been and is being conducted by many public utilities with a fair measure of success. Such a campaign is in nowise related to the broader field of public policy. The economics of a public utility has much of the political in its make-up. Even if the politician does eagerly grab the opportunity to make capital out of the utility, there are many real political elements involved in the relation of the company with the public through its franchise rights.

AVOID DEBATES—GIVE NEWS

Then what sort of a campaign can be conducted when you are pitted against the politician? Were the field open and unopposed as it might be were your cause a religion, or a cure of disease, or the establishment of a new product, then it would be only a matter of extensive publicity to secure converts. In the public utility field to present direct arguments simply opens up the way for a public discussion and a chance for the politician to come in with his usual tirade. It is not to be understood that because of this that the companies should be silent. Not at all, but in the public utility field the experience is that the presentation of a doctrine—usually—is productive of a discussion wherein the reformer and the politician "with ideas" weaves out a different theory—usually to the disadvantage of the utility concern. Let the politician start the debate.

Newspapers—and the writer is familiar with the

newspaper game—will not print all that is offered them. In these days of the press agent the city editor is prone to look over copy frequently with considerable suspicion. He is not taking chances of having something put over on him. He is by nature a seeker of sensations. Copy which has the earmarks of the "unique, odd and curious" will find its way into the columns of a paper frequently quite unrecognizable. The man who accuses the corporation of being a thief has a better chance in its columns than the man who desires to exploit a good deed of the company. That is not due to any prejudice against the public utility corporation, but for the reason that the newspaper man of to-day regards news value as the primal feature of copy when he passes judgment upon it. For that reason the words "Stop Thief" have a higher news value than "Brotherly Love." Still the newspapers are inclined to be fair, and when copy of real news value is presented to them it will find its way into the columns—perhaps not just as you hoped, but partially recognizable.

In presenting the above views it is not to be understood that the "gum-shoe" method is favored. The "gum-shoe" plan is obsolete. This is a progressive age—we are told many times a day—and it is reasonable to assume that the future of public utility operation lies in good service and an honest administration of affairs. Regulation through commission has already cleared the atmosphere of many of the difficulties experienced with the public, and that it will continue to do so is also a truism worthy of acceptance by all. But when the national publicity campaign is mapped out care should be taken to avoid the errors of the past and examine thoroughly into the effect of the "direct system" of big advertisements and telling the "truth" to the voter, as experienced by most of the large companies of the country.

STUDY OF ENGINEERING MATERIALS

Among the general subjects to be treated before the International Engineering Congress, 1915, to be held in San Francisco Sept. 20-25, 1915, probably the one having the broadest interest is that of materials of engineering construction, which enters into all phases of engineering activity.

The list of topics which will be treated in this section is as follows: (1) timber; (2) preservative treatment of timber; (3) substitutes for timber in engineering construction; (4) brick in engineering structures; (5) clay products in engineering structures; (6) probable and presumptive life of concrete structures made from modern cements; (7) aggregates for concrete; (8) slag cement; (9) waterproof concrete; (10) cements containing additions of finely ground foreign material; (11) economics of the world's supply of iron; (12) the life of iron and steel structures; (13) the employment of special steel in engineering construction; (14) the place of copper in the present engineering field and the economics of the world's supply thereof; (15) alloys and their uses in engineering construction; (16) aluminum in engineering construction; (17) the influence of the testing of materials upon advances in the designing of engineering structures and machines; (18) cement testing; (19) testing of metals; (20) testing full-sized members; (21) proof testing of structures.

The Wichita Falls Traction Company, Wichita Falls, Texas, has put in service an electric car equipped with a primary battery, the invention of two local engineers, J. J. Krohn and John McGivney.

COMMUNICATIONS

FUNDAMENTAL FACTS REGARDING ELECTROLYSIS

Columbus, Ohio, May 23, 1914.

To the Editors:

By way of comment on the present electrolysis situation, I wish to call attention to the following fundamental and incontrovertible engineering facts.

1. All the street railway systems in the United States, with the exception of those in Washington, D. C., Cincinnati, Ohio, and New York City, use the running rails in contact with the ground as a whole or part of their return electric circuit.

2. Where such running rails are used on improved city streets as part of the return electrical circuit it is not feasible to insulate the rails entirely from the ground, and there will always be a tendency for part of the return current to shunt off the rails into the ground and then on to adjacent underground metallic structures. However, on private rights-of-way it is entirely practicable, with standard clean-rock ballast roadbed construction, where the rails are entirely free from the ballast, to provide and maintain an operating condition of practical electrical insulation of the return circuit from ground.

3. It is a universal law that there can be no electrical current flow unless there is a continuous or closed circuit of metallic or electrolytic conductors. That is, just as much current must return to the generator as was sent out from it. There is no such thing as a "lost" current. The losses arise from the resistance encountered as the current is coming back to its source.

4. Electrical currents do not merely take the line of least resistance. They follow all paths in inverse proportion to the resistances of such paths.

5. In accordance with the preceding law, the tendency of currents to shunt off the rails is governed by the relative resistances of the rails as an electric circuit and the adjacent ground as an electric circuit. As underground water and gas mains and lead sheaths of cables may form relatively easy paths for the return current to travel through, there will always be a tendency of the current from the grounded rails to shunt off and go on to the underground network of other utility structures. If the resistance of the return electric circuit is kept down so that during any ten-minute period the average over-all voltage drop in the tracks shall not exceed seven volts, and the average potential gradient shall not exceed one volt per 1000 ft., in most cases the percentage of current that will stray off on to other underground metallic structures will be so small as to make the electrolysis damage negligible.

6. Where current travels on an underground metallic conductor, such as a water or gas main or lead sheath of a cable, and goes into the adjacent soil, the metal will always be corroded at the point where the current leaves the metal to go into the soil, regardless as to whether it is merely a temporary shunting around a high-resistance joint, or is a permanent leaving of the underground structure.

7. Underground water and gas mains or lead sheaths of cables are not installed as electrical conductors, and the water and gas lines cannot be made into, and maintained as, continuous electrical conductors.

8. Where corrosion of underground structures takes place the amount of corrosion depends directly upon the number of amperes of current flowing, and the duration of the flow.

9. The placing of metallic connections between underground structures and the return circuit of a railway, while preventing the corrosion of such under-

ground structures at the point where such connection is made, will materially increase the current flow on such structures, thereby producing new and unknown hazards back of where the electrical metallic connection is made.

10. Where water and gas lines are corroded they produce a serious fire hazard, and the corrosion of gas mains, in addition, produces a serious personal injury hazard from gas explosions.

11. Where underground metallic structures are used as carriers of electrical current there will always be more or less interchange of current between such structures.

12. There are adequate engineering remedies to successfully cope with the operating conditions and hazards above outlined.

13. The cost of installing such remedial measures, considering the hazards to be guarded against, is not excessive.

If the preceding facts would be faced squarely by all parties interested in electrolysis prevention there would be no chance for litigation, and a satisfactory solution would be reached at a reasonable cost.

SAMUEL S. WYER, Consulting Engineer.

MAINTENANCE OF ALL-STEEL CARS

NEW YORK, WESTCHESTER & BOSTON RAILWAY
NEW YORK, May 26, 1914.

To the Editors:

The question as to the behavior in service of all-steel cars, which was raised in your last issue, may be answered according to the experience of the New York, Westchester & Boston Railway by saying that our car bodies have required absolutely no repair work whatsoever during their two years of service. Interior fittings such as sash, doors, seats and fixtures have, of course, required a normal amount of attention, but the steel car body proper, as well as the trucks, has been free from maintenance charges.

These cars are 70 ft. 4 in. long over platform end-sills. The weight of the body, including foundation brake rigging and interior fittings such as seats, lights and other equipment required to place the car in condition for operation, is 60,676 lb. The motor-truck, which is equipped with 42-in. wheels, weighs 15,500 lb. and the trailer truck 12,580 lb. The air compressor and the single-phase motors and control equipment weigh 30,266 lb. As the car body and trucks exclusive of the electrical equipment weigh 88,756 lb., the weight per foot length amounts to 1260 lb., the car being 9 ft. 8 in. wide.

As the cars are operated in both express and local service, maintaining speeds up to 56 m.p.h., and as they are subjected to the vibration caused by the acceleration of single-phase motors, it might be expected that some trouble would be experienced with loosening rivets or distortion of members during two years of constant service. From close observations of the equipment, however, it has been demonstrated that no deterioration of any kind has taken place.

The ability of the cars to withstand shocks and collisions has been demonstrated in one instance. Prior to the opening of the road for service a work-train, composed of an electric locomotive weighing 80 tons together with two flat cars loaded with 120 tons of rails, collided with two of the passenger cars which were at a standstill. The locomotive was moving at the rate of about 15 m.p.h.

The effect of the collison was to break the drawbar and its fastenings on the car which was struck, and the car mounted the locomotive end-frame. However, the damage done to the car was confined entirely to the platform, not even a single pane of glass being broken in the car body. The repair work was a simple matter as the parts that were badly bent were cut out and new members riveted in place, the latter consisting of steps, corner posts, and an end-door frame, which were purchased from the manufacturer. The sills were not badly bent and were straightened in place. This work was all done by the shop blacksmith and helpers, and the procedure appeared in strong contrast to the work that would have been required if the car had been constructed of wood, as a large force of carpenters would then have been necessary.

Invariably I have found that the repairs on steel cars are simpler and easier to make than those on wooden cars, and a careful selection of the steel entering into the construction, together with a thorough first painting of the car, will permit the operation with very little trouble from rusting. Our cars ran for approximately one and one-half years, and were then given one coat of color and two varnish coats on top of the original paint. Notwithstanding the fact that the cars are subject to the effect of steel dust from the overhead wire and pantograph shoe, which falls upon the car roof and turns to rust, no sign of deterioration has been found, although this condition requires very frequent cleaning of the car sides with a consequent wear upon the paint surface. Inspections of the paint prior to the application of the new coats show invariably that the original ground coats of paint are in good condition, and there is absolutely no indication of rust under the old paint. Summed up, I have no hesitation in saying that a well-designed steel car is infinitely preferable for all classes of service to cars that are constructed of wood.

R. R. POTTER, Superintendent of Car Equipment.

HUDSON & MANHATTAN RAILROAD COMPANY
NEW YORK, May 27, 1914.

To the Editors:

A communication in your last issue brings up the question of the maintenance of steel cars, and with reference to this I would say that the all-steel car bodies on the Hudson & Manhattan Railroad have involved practically no maintenance costs during their six years of service. Roughly speaking, we have spent about $300 per year on this work during the past four years, or an average of about $1 per car per year. These cars are 48 ft. long over all, and the body, ready for service, but exclusive of control equipment, weighs 30,000 lb. The trucks weigh 21,890 lb. and the electrical and air-brake equipment 17,730 lb.

The cars are operated mostly in tunnels in which the temperature remains constantly at about 60 deg., so that when the cars come into the tunnels from the yards or surface extensions the change in temperature is very rapid, thus subjecting the steel work and its protecting paint to extreme expansion and contraction. The road has many curves and grades, and fast schedules are maintained, a number of the cars being geared to 65 m.p.h.

The first of the cars went into service in February, 1908, 286 now being in operation. Up to the present time very little sheet metal work has been done on the bodies, the heaviest work being the renewal of the sheet-metal roof plates on a few of the first cars which were subject to the salt water drip during the tunnel construction period. There is no appearance of corrosion of the sills or rivets that would indicate that future repairs will ever become heavy.

The maintenance of these cars does not require the employment of any high-paid structural steel workers nor is any special machinery installed. The ordinary

car repairman soon learns to drill steel and drive rivets, while the lighter work is done by a tinsmith with a cornice brake.

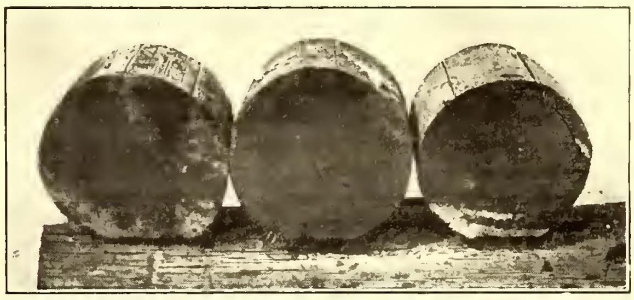
Of course, a steel car, if properly designed, will be much less damaged in a wreck than a wooden car, and when badly damaged it is no more difficult to repair. The bent members can usually be straightened into shape by applying proper strains and heats to the distorted parts. Indeed, from my experience with tunnel, elevated, interurban and city equipments, the all-steel car, when properly constructed, appeals to me as being the best suited for all classes of electric car service.

P. V. SEE, Superintendent of Car Equipment.

PROTECTIVE EFFECT OF CREOSOTE ON YELLOW PINE AND CEDAR PILES

In the proceedings of the tenth annual meeting of the American Wood Preservers' Association, F. B. Ridgway, in charge of the department of chemistry and tests of the International Creosoting & Construction Company of Galveston, Tex., gives the results of creosoting piles used in the Santa Fé railway bridge across Galveston Bay. The information is of remarkable value in that it relates to treated piles some of which were in place for thirty-eight years. The recent dismantling of this bridge gave an opportunity to study the relative service ability of untreated, inadequately treated and thoroughly treated piles in Southern waters. For the first bridge, built in 1875, creosoted piles were used, but the amount and character of the creosote, as well as the amount of previous seasoning, are unknown. In 1895 the trestle was reconstructed, the piles being treated according to the best practice of that period. Many of the piles of the original trestle were left standing between the bents of the new structure. When the causeway was started in 1909, increasing temporarily the demands upon the old bridge, it was decided that some reinforcements were needed for the trestle, and some untreated pine piling was put in. When the old structure was dismantled last summer it was found that the thoroughly treated piles were almost all in good condition; that, while the majority of those lightly treated in 1875 were almost completely eaten away from mudline to waterline, a few were still in good condition, and that the untreated piles were practically destroyed.

Air, Water and Mud Sections Creosoted Pile Treated in 1875



Air, Water and Mud Sections Creosoted Pile Treated in 1895

PILES TREATED IN 1875

The data regarding the treatment given the original piles thirty-eight years before their removal are very meager. It is estimated that from 8 to 12 lb. of creosote per cubic foot was absorbed. On removal it was found that the air sections had lost almost all outward signs of having been treated. While the hearts were in many cases badly decayed the outsides were sound. In other cases, even where no more than half of the stick had been penetrated, both heart and outside were in good condition. The variations were attributed to the amount of butt cut off after driving and the consequent varying amount of untreated wood exposed. In the majority of cases the water sections were more or less attacked by the teredo and limnoria. Air, water and mud sections of a typical pile driven in 1875 are shown in the accompanying figure. The pile from which the sections are taken was 11 in. in diameter and showed a 3½-in. penetration and a 4-in. untreated center with a very sharp line of demarcation.

PILES TREATED IN 1895

The piles driven in 1895 were treated by Riker-Lee & Company of Galveston, now the International Creosoting & Construction Company, and were guaranteed for ten years. They were pine piles direct from the stock, seasoned by steaming. When removed these piles were found to be in good condition, at least 90 per cent being fit for use elsewhere. Most of these piles were penetrated throughout with the preservative, and in no instance, even where the amount of oil absorption is less than the average, is there any sharp division line between the treated and untreated portion of the stick.

The oil used in the piles treated in 1895 was what was then known as "heavy oil," not on account of its high specific gravity but because at ordinary temperatures it contains a large percentage of solid matter. It was imported English oil, which, as extracted from the mud section, was found to have a low boiling point, containing 60 per cent of naphthalene and something more than 12 per cent of tar acids. Among the piles treated in 1895 were 110 of red cedar. These were found on removal to have been attacked only slightly in spite of the difficulty of injecting a large amount of oil into this timber.

EFFECTS OF BORERS ON UNTREATED AND TREATED PILES

The effects of borers on the untreated pine poles driven in 1909 for the purpose of reinforcing the old structure were very severe, many of the poles being completely eaten through by limnoria, with evidences also of the toredo. These borers work from the water line to the mud line.

While the borers attack treated piles also it is noted that in many instances where the treated piles have been attacked the borers have entered through knots. Most of the 1895 piles that have so suffered are very resinous. It is very difficult to force oil into knots or resinous pieces of timber, and from the analyses made Mr. Ridgway thinks that the pieces that were attacked received less than the average amount of oil on account of their refractory character. Untreated piles examined indicated that the knots were less attacked than the softer wood around them, hence the resistance of knotty and resinous piles to all penetration is to blame, rather than the structure of the wood itself, for the vulnerability of this class of timber.

American Association News

An Educational Course Has Been Arranged in Accounting—Reports of Meetings of Sub-Committees on Car Wheels, Gears and Pinions and Lighting Protection—Meetings of Company Sections

The committee on education of the American Electric Railway Accountants' Association has made an arrangement with Prof. John R. Wildman, head of the accounting department in the New York University School of Commerce, Accounts and Finance, by which a course on electric railway accounting by mail is offered to members and employees of member companies of the association. A letter announcing the extent of the course, which extends over a period of two years, has just been issued by the committee on education of the Accountants' Association, consisting of F. J. Prior, chairman, F. B. Lasher, G. G. Whitney, J. L. Conover, Jr., and N. E. Stubbs. The letter follows:

"The committee on education of the American Electric Railway Accountants' Association has completed arrangements with John R. Wildman, C. P. A., professor of accounting, in the New York University School of Commerce, Accounts & Finance, to supervise a systematic course of instruction in electric railway accounting.

"The business of life requires of us as individuals that we equip ourselves for our work. If our work lies in the field of business, proper equipment requires that we have a knowledge of economics for the science of business. If we have to do with accounting, it is essential that we should study it as a science as well as be familiar with the rules whereby the science is made operative.

"Education for business is no longer an experiment. It is not at all improbable that the near future will find it one of its essentials of success in the business field. It not only contributes to that peace of mind which is conducive to long life, but it paves the way to the material comforts which help to make life pleasant. Hundreds of young men who in the last ten years have graduated from the university schools of commerce testify to this fact. Where hundreds of men have attended such schools, thousands have craved the opportunity, but have been prevented by considerations such as distance, lack of time, etc.

"To overcome distance and time, we propose to carry the material to our members, have them study and resolve upon it, and submit their results.

"The course will extend over a period of two years, the terms running from October to May, with eight lectures in each year.

"The work of the first year will embrace the study of the theory of accounting, with sufficient application to street railway work through applied theory tests and simple problems to sustain the interest and make the work of practical value. The topics taken up will be as follows:

"1. The purpose and scope of accounting.

"2. The relation of accounting to allied subjects such as economics, law, finance, and organizations.

"3. The method of keeping books and the media for recording financial transactions.

"4. Accounts; their philosophy, construction and classification.

"5. Discussion of the balance sheet accounts.

"6. Discussion of the revenue and expense accounts.

"7. Preparation, interpretation and use of balance sheets, income statements, etc.

"8. Graphs, charts and statistics as aids to operation and management.

"The work of the second year will embrace a series of corporation problems built around street railway organizations and into which will be woven the principles of corporation law.

"1. Organization and development.
"2. Operation.
"3. Merger.
"4. Consolidation.
"5. Holding company.
"6. Receivership.
"7. Reorganization.
"8. Dissolution.

"It is proposed that the papers submitted by the subscribers shall be critically reviewed, rated and a record kept of the marks. A certificate of proficiency will be given to each individual who shall have satisfactorily completed the two years course. Furthermore, two monetary prizes will be annually awarded during the continuance of the course; one to the first-year and the other to the second-year student.

"Professor Wildman is authoritatively fitted to direct the course outlined above. He is a professor of accounting in New York University School of Commerce, Accounts & Finance; a certified public accountant of New York State; member of the American Association of Public Accountants; member of the committee on terminology of same; formerly editor, department of practical accounting of the *Journal of Accountancy;* an author of a number of works on accounting, and now also engaged in private practice.

"The course is operative only on the securing of 400 subscribers by Sept. 1 next. The ultimate success of the committee's work now lies in the assistance which your company will consider proper to encourage, your employees who may be interested in the subject."

The letter is accompanied by subscription blanks for the lectures in accounting by mail. The committee requests that these should be filled in and mailed to the chairman of the committee, 29 West Thirty-ninth Street, New York City, where additional blanks can be had upon request.

MEETINGS OF SUB-COMMITTEES ON CAR EQUIPMENT

STEEL WHEELS

On Tuesday, May 26, a meeting of the sub-committee on specifications for solid wrought carbon wheels for electric railway service was held for the purpose of preparing recommendations for changes in the wheel specifications to be reported to the equipment committee at a meeting to be held in the near future. The sub-committee meeting was attended by J. P. Barnes, chairman, general manager Syracuse & Suburban Railroad Company, Syracuse, N. Y.; W. E. Johnson, engineer of car equipment Transit Development Company, Brooklyn, N. Y., representing W. G. Gove, and the following representatives of manufacturers of steel wheels: G. Aertsen, Charles Tietze and Howard C. Myers, Midvale Steel Company; H. P. Tiemann and L. W. Conroy, Carnegie Steel Company, and A. A. Stevenson, Standard Steel Works Company. The Pennsylvania Railroad was represented by Mr. Waring.

The sub-committee on steel wheels met on Jan. 6, and made a number of revisions of the working specifications of 1913. These specifications as revised were submitted to the committee on equipment on Jan. 29 and were there further revised. A circular letter was then sent to engineers interested in either of the

committees, embodying the results of the two revisions and asking for criticisms. The meeting held this week was for the purpose of discussing these criticisms.

As a result of the suggestions and the conference a number of important changes were decided upon. In the first place the phraseology of machined and unmachined contours is dropped and instead two sets of tolerances are allowed, one being more rigid than the other. The less rigid tolerances are adapted to ordinary construction under usual operating conditions. They are the ones which, presumably, will be generally specified. The more rigid tolerances are to be used for specifications where local conditions require greater accuracy in dimensions. As an example of where they might be specified the committee suggests the case of steel wheels put into city service and used over old special work in which small grooves are found.

Another change in the specifications is the extension of the limit of chemical content to include acid steel. The physical limit, of course, remains the same.

The manufacturer's representatives present at the committee meeting agreed to the furnishing of wheels mated from the same heat as far as possible. This will insure, within reasonable limit, the same chemical composition for the two wheels of a pair.

GEARS AND PINIONS

A meeting of the sub-committee on gears and pinions was held on Wednesday, May 27. It was attended by W. E. Johnson, Transit Development Company, Brooklyn, N. Y.; Norman Litchfield, Interborough Rapid Transit Company, New York, and J. P. Barnes, Syracuse & Suburban Railroad, Syracuse, N. Y. The committee finds from its investigations that few railway companies are buying gears and pinions in accordance with specifications for material. There is little knowledge as to which material gives the best results as to wear and general service. The committee desires to secure the practical co-operation of users and manufacturers of gears and pinions with a view to ascertaining present conditions. The committee will not try at present to prepare specifications for report to the equipment committee, but will conduct correspondence with engineers who are experimenting with different types of gears and pinions. The committee will endeavor to outline the fundamental conditions of service and to get in touch with men who have secured good results with certain types of gear under certain conditions. Results of unsatisfactory service under definite conditions are also to be studied. The committee will analyze the condition of the various cases and will try to relate them to the material and construction of the gears. Manufacturers will also be approached for the purpose of securing data on various gear and pinion materials and to enlist their co-operation in the study. The committee will appreciate information from any railway men who have had marked success or failure under any conditions of service. In sending information the request is made that details of the material used and the service conditions be given. Such matters as gear ratio, pitch, weight of cars, schedule speed, stops per mile, etc., will be very valuable for purposes of analysis.

When the data have been thoroughly studied the subcommittee will make a report to the equipment committee, but it is hardly probable that there will be any definite recommendation in this year's report. It is expected, however, that very valuable material will be accumulated for the use of future committees.

LIGHTNING PROTECTION

The sub-committee of the committee on equipment which is making studies of lightning protection held a meeting on Wednesday, May 27. It was attended by J. P. Barnes, chairman, Syracuse & Suburban Railroad, Syracuse, N. Y., and D. E. Crouse, Maryland Electric Railways Company, Annapolis, Md. The sub-committee had framed a list of questions designed to bring out current practice in regard to the installation of lightning protective equipment and to learn the results of the use of such equipment. The committee is taking up the question of the interdependence of line protective equipment and car protective equipment. Replies to the questions have been received from 120 companies and these are now being tabulated and the results are being analyzed.

It is interesting to note that of the companies reporting on the matter of car wiring about one-half use conduit. This feature was taken up by the committee with a view to determining the relation of the method of wiring to the effectiveness of the protective equipment. Of those using conduit also, about one-half have trouble from lightning while the other half do not. The committee is also studying the relation of the nature of the soil to lightning troubles.

After the analysis has been conducted far enough to indicate some tendencies, another meeting of the committee will be held and lightning protection specialists from outside the committee will be invited to attend. It is expected that ultimately an ideal set of answers to the committee's questions can be formulated. While this is an unusual form for a committee report, it is expected that it will summarize effectively the result of the canvass and analysis and will make the information readily accessible.

MEETINGS OF COMPANY SECTIONS

The regular monthly meeting of the Denver Tramway Company section was held at the auditorium on May 21. The subject in the evening was "Safety, Its Recognition and Enforcement," by Howard S. Robertson, of the Legal Department. This is the last regular meeting of the present season. At the previous meeting held April 18, Mr. Swift, tramway instructor, gave a talk on "Modern Methods of Instructing Street Railway Employees."

A meeting of the company section of the Washington Railway & Electric Company was held May 18. It was a joint meeting with the commercial department of the Potomac Electric Power Company and partook more of a social than a business character.

The May meeting of the Public Service section, held at Newark, N. J., is reported at length elsewhere in this issue.

NATIONAL EXHIBITION IN SWITZERLAND

The Swiss National Exhibition, which is held in Berne up to Oct. 15, had a brilliant opening on May 15. This is only the third exhibition arranged by Switzerland, the two preceding having been held in Zürich in 1883 and in Geneva in 1896. Among the many exhibits is one of interest to the electric railway industry. In this branch the Swiss Federal Railroads is the largest exhibitor, showing among its rolling stock the first locomotive (now about seventy years old) and the newest and most modern locomotives employed for express trains on the St. Gothard line. The new Lötschberg Railway shows its 2500-hp electric engines, which are the most powerful of their kind in the world. There are also on view railway carriages for invalids, rotary snow plows, mail and luggage vans, and vans for the transport of wine, beer and meat and other perishable articles. An electric railway circulates over the entire exhibition grounds, which comprise an area of 500,000 sq. m.

Equipment and Its Maintenance

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

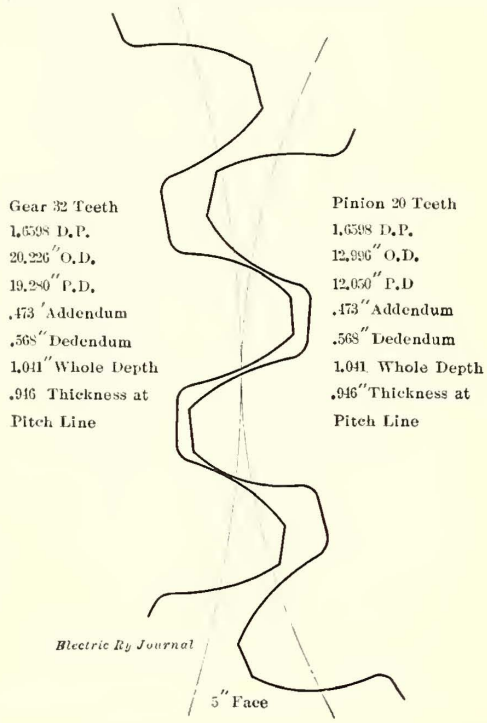
(Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates)

STUB-TOOTH BULL-NOSE GEARS

BY E. F. GOULD, ASSISTANT TO GENERAL MANAGER AND ENGINEER AURORA, ELGIN & CHICAGO RAILROAD COMPANY, WHEATON, ILL.

The train service operated by the Aurora, Elgin & Chicago Railroad on its third-rail line demands high acceleration and high running speeds. The severe operating requirements have made it necessary during the past few years to increase the strength of the gear and pinion teeth in every available way. The type of tooth recently adopted as standard and one which has given excellent results is illustrated.

The rolling stock of this road includes thirty-two four-motor cars, fourteen two-motor cars and ten trail cars. Trains are made up with an average of three motors per car. The motors are the GE-66-B, rated at



Tooth Outline of Gear and Pinion for GE-66 Motor

125 hp at 500 volts. With 37-in. wheels and full voltage the equipment is geared to about 65 m.p.h. This is a high-speed gear ratio, and as the power feeder conditions are exceptionally good, due to the use of a 100-lb. conductor rail with substations only 8 miles apart, the motor gearing is called upon to transmit relatively large amounts of power during acceleration. During sleet storms, also when collector shoes do not always make continuous contact, exceptional strains are thrown on the gearing.

In the development of the present gears the old ratio of 1.6 has not been changed. The first gears used were three pitch, having fifty-eight teeth in the gear, thirty-six teeth in the pinion and a 5-in. face. As traffic developed and the service requirements became more severe, breakage of teeth in these original gears called for a design with a stronger tooth, and accordingly the pitch was changed to 2.489. This gave forty-eight teeth on the gear and thirty teeth on the pinion. Although this latter type gave a larger tooth section trouble from breakage still was experienced.

The latest type of tooth has been in service on a number of cars for a period of nine months and no breakage has occurred. This gearing has a diametral pitch of 1.6589 and has an exceptionally big blunt tooth which is very rugged. The characteristics of the gearing are shown with the outline illustrated herewith. These gears and pinions are made by the Tool Steel Gear & Pinion Company, of Cincinnati.

BINOCULARS TO DETECT LINE TROUBLES

BY C. L. CADLE, ELECTRICAL ENGINEER NEW YORK STATE RAILWAYS

The New York State Railways had much trouble on the Rochester & Eastern transmission line, which parallels the trolley line from Rochester to Geneva, N. Y., a total distance of approximately 40 miles. This line was built in 1903. Our interruptions were caused by all manner of defects. The transmission line is on the top of a 35-ft. pole line, carrying trolley and feed wire. We found that the vibration of the poles due to the cars loosened the pins from the arms and the insulators from the pins. This vibration also had a tendency to loosen the tie wires on the insulator. A great many interruptions occurred because these defects allowed the wires to come off the poles. A very close examination was made by an inspector once each two weeks, but the trouble did not seem to be entirely eliminated.

Later we conceived the idea of using high-powered binoculars. We, therefore, obtained from the Bausch & Lomb Optical Company, Rochester, a number of field glasses. After testing these out, we found that an eight-power glass was by far the most satisfactory. We started the high-tension line inspector over the line and instructed him to use all the time he wanted to locate troubles. He covered the complete inspection in approximately ten days, or about 4 miles per day. With the aid of the glasses he located 161 individual cases which could not have been seen by the naked eye, but which might have caused an interruption in each case. Repairs were completed by March 6, since which date we have not had any interruption due to line trouble. The glasses cost us $45, and we feel that the expenditure has brought to our company the largest interest on any investment that it ever made.

A summary of the defects found are as follows:

Loose sky pins	81
Insulators loose on the pins	34
Loose pins on cross-arms	20
Broken insulator	1
Broken tie wires	2
Broken cross-arm pin	1
Locations where one strand of the wire was broken	16
Locations where two strands of the wire were broken	2
Locations where three strands of the wire were broken	4
Total	161

The cable composing this transmission line is seven-strand aluminum and is giving excellent service with proper care.

SPECIAL WORK SERVICE RECORDS

BY M. BERNARD, ASSISTANT ENGINEER WAY AND STRUCTURE DEPARTMENT BROOKLYN RAPID TRANSIT SYSTEM

Data concerning the performance of special work are very rare. Engineers, as a rule, favor some particular type of manufacture for almost any other reason than the efficiency ratio of that type selected. In order to get an idea of the relative service value of different types of special work in use a comparison of service (not length of service) of a representative number of crossings (90 deg. skew and curved), branch-offs and connecting curves has been made. The reference letters in the accompanying table refer to the four types of manufacture in common use.

The information required was recorded in the form reproduced. The average life in terms of cars operated over each layout for various types of special work was found to be as shown approximately in the table.

M'f'r.	A	B	C	D	Type
Car-life	750,000	1,000,000	1,250,000	1,250,000	90 deg. crossing
Car-life	600,000	1,000,000	1,000,000	1,000,000	Skew crossing
Car-life	750,000	1,250,000	1,250,000	1,250,000	Curved crossing, long rad.
Car-life	1,250,000	2,000,000	2,000,000	2,000,000	Branch-off, long rad.
Car-life	1,750,000	1,500,000	1,500,000	1,500,000	Branch-off, short rad.
Car-life	600,000	1,000,000	1,000,000	1,000,000	Curved crossing, short rad.

The information thus gathered and many personal observations lead to the following conclusions:

The life of crossings, if straight, does not depend on the wear of the rail but on the compactness of the castings and of the joints; the life of curved crossings, however, depends more upon the wearing quality of the rail and of the center than upon the quality of the joints.

Long radius curved crossings last as long as right-angle crossings; their life is a little more than that of skew crossings. This might be attributed to the fact that the resultant of the bearing load is divided into horizontal and vertical moments while that on a straight crossing is only vertical.

The life of a sharp radius crossing is generally much lower than any other type of special work, due probably to the fact that the rails are worn out before the casting is broken up under the impact of the load of the cars. The life of a branch-off with a radius of 100 ft. or thereabout for the curve is generally equal to the life of a 90-deg. crossing. The life of a branch-off with a radius of 40 ft. or thereabout is generally higher than a curved crossing, due probably to the slower moving of cars over branch-offs than over crossings.

Connecting curves, which are to be used for emergency only and which therefore consist of jump frogs, if placed inside the crossing as much as possible appear to strengthen the crossing; the rails of connecting curves so placed seem to act as braces between the rails of the crossing. The scrapping of curved frogs with sharp radius when the casting is still good, because of the gouging out of the rails, would indicate that it would be economical to bring the life of the component rails nearer to the life of the casting proper by using an alloy steel for the rails. The writer concludes from the available data that the present practice of using rail of the same composition for both curved and straight crossings is wrong; it would be better to use, for the former, rails of some alloy-steel, which would bring its wearing value nearer to that of the hardened steel center and thus prolong the life of the special work.

Because of the terrific force of impact exerted by a moving load on the castings of straight crossings, the use of soft steel centers is advocated in place of the hardened steel centers now in universal use. It is the theory of the writer that centers made of medium steel would absorb part of the shock which in the general type of castings is transmitted entire from the hardened steel center to the hardened steel floor, and from this to the binding metal itself. As is well known, cast iron is not a very good shock absorber. If these centers are made of an easily renewable type, such construction should last longer than any other type of crossing. On account of the relative cheapness of the metal the renewal of the centers would be of minor importance from an economic standpoint. The use of bolted joints with reamed holes is also considered important for straight crossings; the numerous "dutchmen" to be found at interior joints of straight crossings prove that ordinary channel bar joints with track bolts are not the correct type for the purpose.

The foregoing comments refer to iron-bound manganese steel center construction only, which is the standard construction on the Brooklyn Rapid Transit System. These centers are specified to be of the renewable type.

NEW CARS FOR OLD IN PITTSBURGH

The Pittsburgh Railways Company has been splicing together pairs of its old 20-ft. car bodies to form center-entrance cars 48 ft. long. The completed cars are equipped with new "low-floor" trucks and motors and with standard Pittsburgh folding doors. With these new features the cars have been made into thoroughly modern equipments. The limited width of 7 ft. 2 in. over all is, however, a somewhat objectionable feature, although the seating capacity of sixty-five passengers would seem to offset this for all practical purposes.

The splicing is effected by running 5-in., 9.75-lb. I-beams between the ends of the three center sills on each old car body, the platforms being removed from both ends of the old cars. In addition two 3-in. x 3-in. x ⅜-in. angles are bolted to the side sills and are bent down to form the edge of an interior step for the 6-ft. well or vestibule at the center of the rebuilt car. A ⅜-in. x 3-in. plate is fastened to each letter board, extending across the well and stiffening the construction. The bulkheads are of course removed from the old car bodies, and extensions are made at the ends to round off the outline of the rebuilt car. The floor of the car is 27 in. above the rail, and it is reached by three steps, the first one being 15 in. from the ground. The interior step to the floor of the well is 10 in., and

SPECIAL WORK RENEWALS COMPARISON OF SERVICE

LOC. NO.	LOCATION	DESCRIPTION	END RAD.	MID. RAD.	CONSTRUCTION	MFR.	INS'T	REN'D	CAUSE OF REN'L	CARS PER MO.	TOTAL NO. CARS

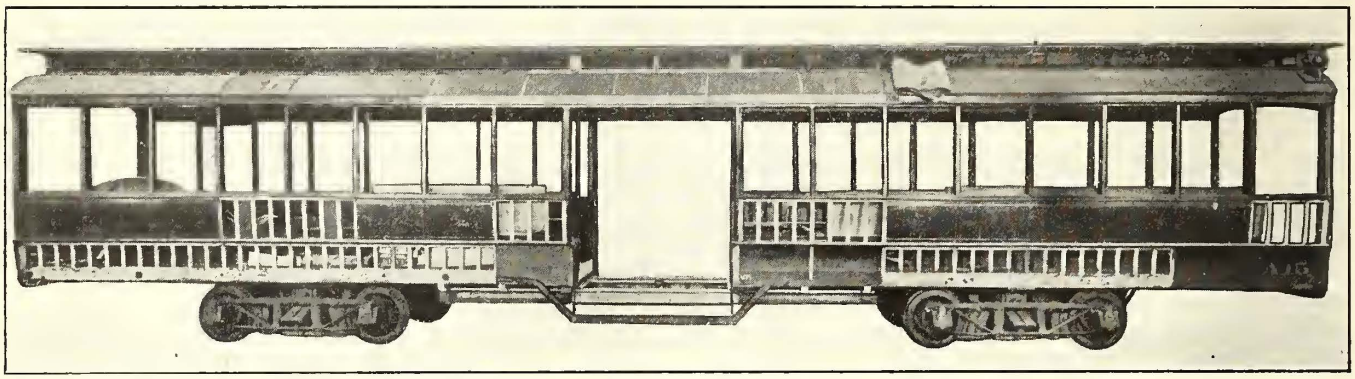
Electric Ry Journal

Special Work Record, Brooklyn Rapid Transit System

the step out of the well is 6 in., the well floor having a ramp of 1 in. toward the center line.

The cost of splicing the old car bodies together and fitting up the doors and end extensions is $400. The electrical equipment and trucks cost about $2,100, making a total cost of $2,500. As there is a salvage value amounting to about $700 on the old motors and truck frames the net cost amounts to only $1,800, although the car when rebuilt appears to be a thoroughly satisfactory, modern, center-entrance car.

The weight complete is 39,350 lb. or about 600 lb. per seat, including two couplers weighing together 1100 lb. The car is, however, operated single end. Three of these rebuilt cars are in operation and one is under construction. Others are to be constructed in the near future for trailer service, thus reducing the investment in electrical equipment, as P. N. Jones, general manager Pittsburgh Railways, considers that this will be preferable, owing to the fact that the spliced bodies, while at present in satisfactory condition, may be subject to more rapid deterioration than would be true of a strictly new car.



Rebuilt Pittsburgh Cars—Old 20-ft. Car Bodies Spliced Together Ready for Construction of Ends and Application of Center Steps and Doors

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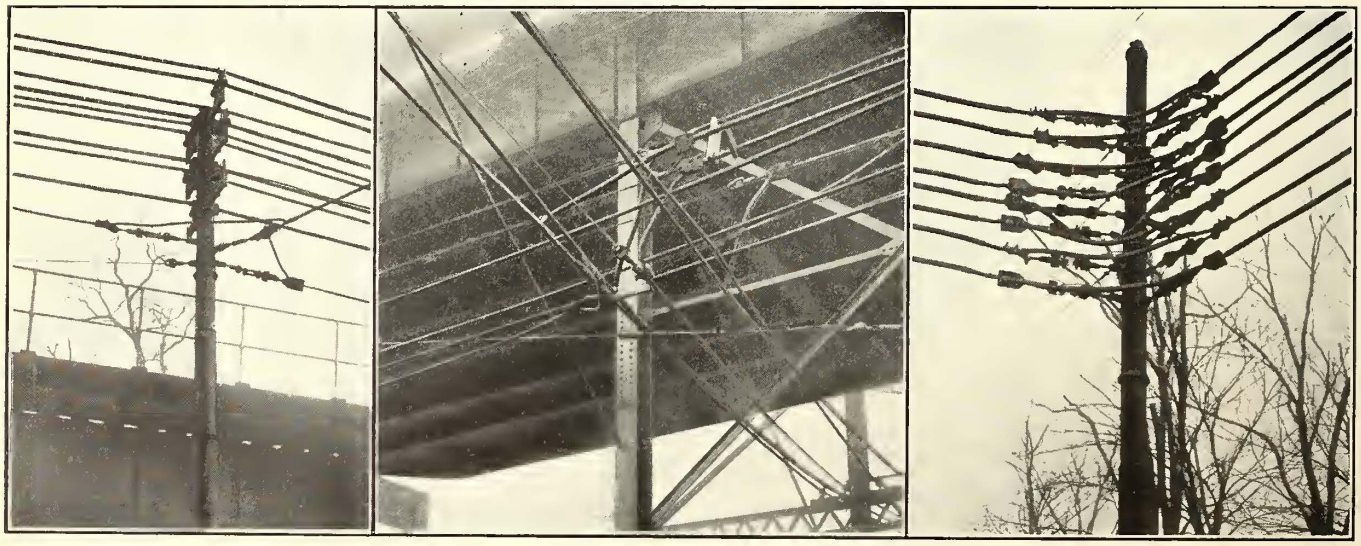
Interesting information and data showing the progress of the wood preserving industry is supplied by the recently issued report of the proceedings of the Tenth Annual Meeting of the American Wood Preservers' Association, held in New Orleans, La., Jan. 20, 21 and 22, 1914. Abstracts of the papers of electric railway interest which were presented at this meeting were published in the Electric Railway Journal of Feb. 7.

A MAINTENANCE RECORD IN CABLE CLAMPS

During the year 1909-1910 the Union Railway, New York, installed under the direction of James D. Kent, electrical engineer, a large number of Matthews cable clamps as described in the Electric Railway Journal for July 2, 1910. In order to show how effectively these clamps have done their work a number of photographs were taken of several of these installations a short time ago. While only three of the locations are shown in the accompanying views, it is proper to state that although a total of 500 clamps were installed not one cent has been paid out for their maintenance. This type of construction has been made standard by the Union Railway. In many cases where quick jobs had to be carried out with the intention of keeping the work temporarily, the installations proved so satisfactory that no changes have been made since. A description of the work at the three locations follows.

The installation illustrated in the right view is considered unique on account of the vertical arrangement of the cables on the iron poles, which is somewhat different from the general method of supporting cables on poles. The size of the cables is 500,000 circ. mils. The insulation removed, as shown on the left side of the picture, was not caused by an error in the original cutting of the cable but was due to the fact that when the pole was replaced in 1910 it was not possible to put it on exactly the same spot as the original pole. The bolts and clamps have not rusted, as galvanized clamps were used.



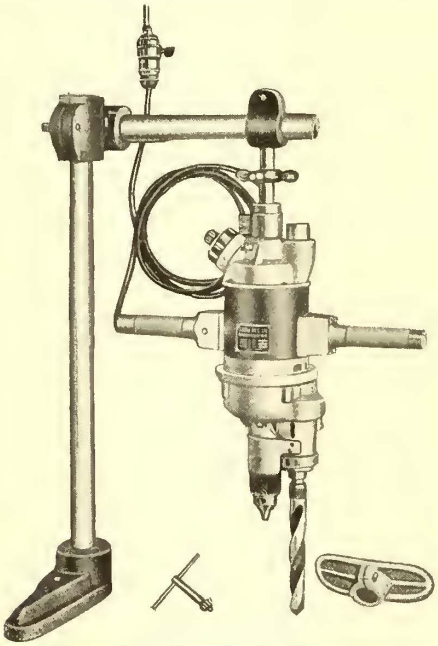
Views of Three Cable Clamp Installations, After Four to Five Years' Service, on the Feeder Distribution System of the Union Railway, New York

The left illustration shows the clamps as used on No. 0000 conductors. On the right side of the view will be seen the right-angle turn which was made without cutting the main cable. The left side of the view shows the use of the cable clamp as a strain clamp for a dead-end tap.

The middle illustration shows a corner turn made in the air with 500,000 circ. mil. cable. The conditions at this point made it impossible to use a pole for this turn. Owing to the great length of the span, 170 ft., it is almost impossible to pull the cables taut enough to support them. This accounts for the presence of the wooden block shown in the view. The installation was considered temporary, yet it has served its purpose to date. This fact certainly speaks well for the holding power of this clamp on so great a span.

A TWO-SPINDLE DRILL

To avoid the need for several sizes of drills in one shop, the Stow Manufacturing Company, Binghamton, N. Y., has brought out the two-spindle drill shown in the accompanying half-tone. This machine will serve for all sizes up to ¾ in. inclusive, and for either straight shanks or Morse taper. The No. 1 spindle runs at 950 r.p.m., is fitted with a Jacobs chuck and



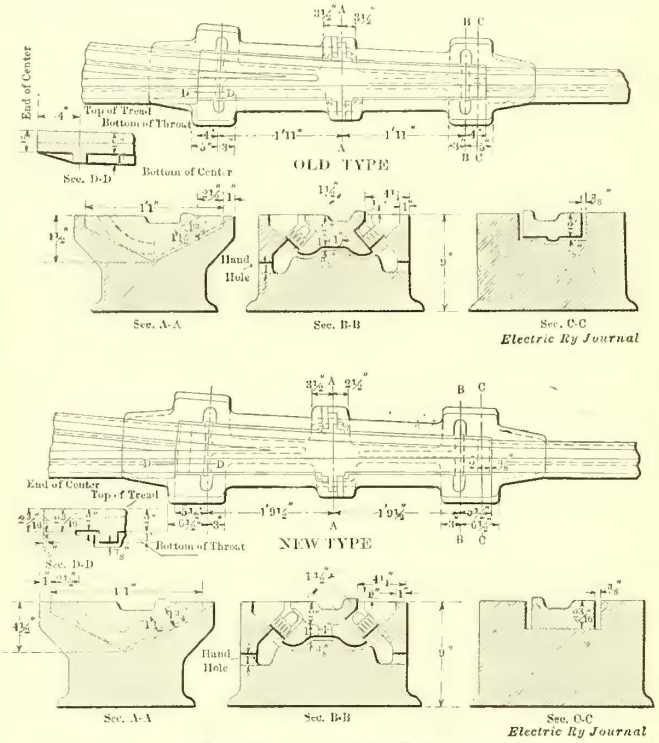
Two-Spindle Drill

takes straight shank work up to ½ in. The No. 2 drill for the larger work is run at 225 r.p.m. The chuck from the smaller spindle can be transferred to the larger one if desired. The machine is especially suited for light tapping, for the tap can be backed out by a simple and easy reversal of the motor. This tool may be operated on either alternating or direct current circuits.

The Louisville (Ky.) Railway is engaged on no less than seven extensive pieces of reconstruction work. Main Street is seeing progress made on laying of new track begun a month ago. Two sections on Broadway, one on Fifteenth Street, another on Barret Avenue, another on Madison and some ten blocks on Market Street are undergoing renewal. The work of the company on West Market Street has had to wait the construction of a new trunk sewer and the company faces the prospect for a large part of the coming summer of having to handle traffic on this line over a temporary track and temporary switches.

HARD CENTER MATES WITH SOLID SUPPORT AT ENDS

The accompanying illustrations show both the old and new types of the Pennsylvania Steel Company's iron-bound "Manard" hard center mate, to give the clearest possible idea of the improvements which this company has recently devised in electric railway mate construction. Heretofore, mate centers have been supported throughout the entire length on a bed of spelter. With this kind of support, the pound of heavy traffic tends to force the ends of the center down, and even tends to produce a flat spot on the rails at the run-off end. This



Old and New Types of Hard-Center Mates

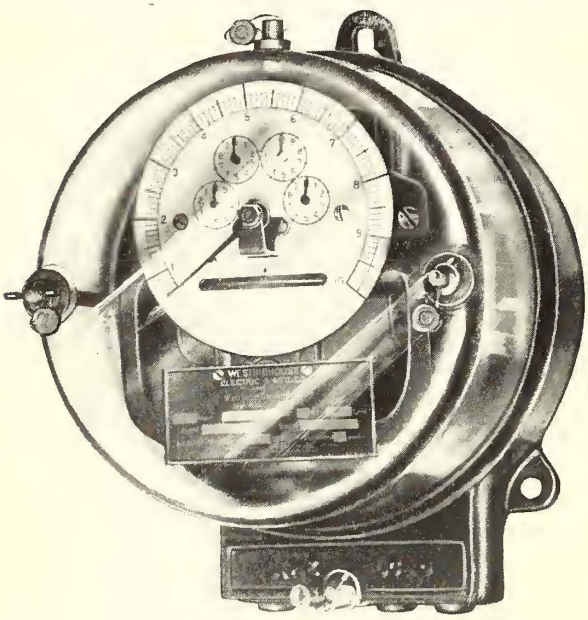
condition, of course, should not be allowed in well-maintained track. A comparison of the corresponding sections *C-C* and *D-D* in the accompanying cuts will indicate that a big improvement is made in supporting the ends of the center on the solid iron itself. With this support it is impossible for the center to pound down.

Attention is also called to the type of fastenings used with the hard center mates. As indicated in the cut, these consist of rapidly-renewable bolts and nuts at the ends of the center and of the key fastening at the center. It is believed that the combination of the two types is more advantageous than the lone use of either. The use of the renewable bolts at the ends permits the center to be drawn down solidly on the supports. The bolt exerts a much greater downward pull than the wedge-shaped key. At the same time the force exerted by the bolt is applied only at the edge of the center. On the other hand, the wedge-shaped key, when driven, exerts a pull on the center for its full width, wedging the center tightly against the iron, as shown at section *A-A*. This is of distinct advantage, for wheels exert a peening action which tends to stretch the surface of the casting and to make it bow up, convex laterally, away from the spelter. The key fastening counteracts this tendency and holds the center rigid.

In Berlin, Germany, mirrors have been attached to the sides of cars at the height of a passenger's head when standing on the lower step. It is hoped by this means to reduce "run-down" accidents.

WATT-HOUR DEMAND METER

A demand meter, known as Type RO, has been recently placed on the market by the Westinghouse Electric & Manufacturing Company, and is shown in the accompanying illustration. This is a single meter that records without the use of a clock mechanism both the kw-hr consumed and the maximum kilowatt demand, thus providing the readings needed on systems that base their charges on maximum demand and power delivered. Both readings can be taken monthly. The meter records the maximum demand of the connected load but not the time at which the maximum occurs.



Watt-Hour Demand Meter

The maximum demand is indicated by a pointer sweeping over a 4-in. dial, and the watt-hour load is recorded on a four-dial counter.

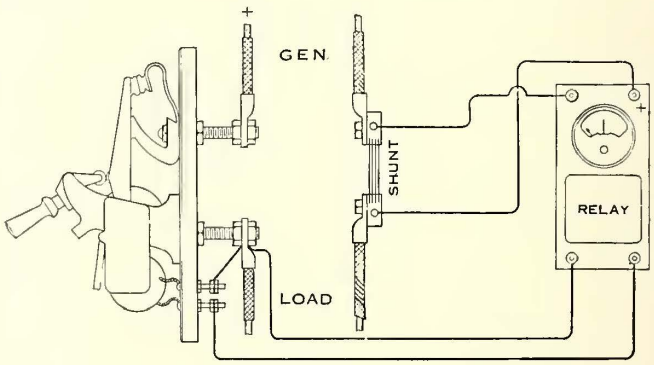
The instrument has no clock, contacts or other delicate parts. It is a combination of an induction watt-hour meter, an induction wattmeter and an escapement form of time element. In addition to the usual watt-hour meter movement, including electromagnet, permanent magnet, and aluminum disk, the instrument contains an auxiliary disk sector supported on a jewel-and-ball bearing so that it can move in the air gap of the electromagnet in such a way that it does not interfere with the accuracy of the main disk, which always rotates at a speed proportional to the load. The rotation of the auxiliary disk is restrained by a spiral spring, making its final deflection proportional to the watt load. The auxiliary disk with its spring and pointer constitute an indicating wattmeter.

The shaft of the auxiliary disk is geared to an escapement wheel, and the claw restricting this wheel is oscillated by an eccentric on the main shaft. The auxiliary disk therefore advances step by step at a speed determined by the speed of the main watt-hour meter disk, that is to say, at a speed proportional to the load. It continues to advance until the spring tension balances the torque produced in the auxiliary disk. The demand mechanism is then in equilibrium and the pointer indicates the watts. As the total deflection and the rate of deflection of the auxiliary disk vary in direct proportion, the time required to reach the maximum position when any constant load is passed through the instrument is a constant. For example, if a load of 500 watts is supplied to a 5-amp 100-volt meter with a fifteen-minute time element, the demand mechanism will reach equilibrium at the 500-watt point in fifteen minutes. If instead a load of 1000 watts is applied to the meter, the demand mechanism will have to move twice as far to the 1000-watt point to reach equilibrium; but the double load will move the watt-hour disk twice as fast, causing the escapement to allow the demand disk to move twice as fast, and it will cover the double arc in the same time.

The auxiliary disk drives the demand pointer through a dog, and a fine-toothed ratchet and pawl holds the demand pointer in the position of maximum deflection, until released by hand. A second ratchet and pawl allows the auxiliary disk to fall back to equilibrium under its spring tension if the load falls below that corresponding to its position at any moment, but prevents it from advancing except as controlled by the escapement as before. The maximum demand pointer can be reset instantly by pressing a sealed button on the top of the cover.

REVERSE CURRENT RELAYS FOR D.C. CIRCUITS

A reverse current relay for d.c. circuits, designed for use in connection with shunt trip circuit-breakers, as shown in the accompanying diagram, has been put on the market by the Roller-Smith Company, New York. The instrument has a platinum contact attached to its needle, which contact co-operates with a similar one carried by an adjustable pilot needle. The circuit established on the engagement of the contacts energizes an electromagnet contained in the rectangular casing mounted below and on the same slate sub-base with the instrument. The electromagnet then establishes whatever external circuit closure the relay is to effect. By connecting the instrument in circuit so that for the normal direction of current flow the needle deflects backward from zero, the trip circuit is maintained open until a reverse current flow occurs, whereupon the circuit-breaker will be opened. As the relay is of the separate shunt type its dimensions are independent of the volume of the current or the capacity of the breaker to be controlled. If ammeters or shunted wattmeters are installed on the circuits to be protected the same shunts serve for the relays. The relay may be mounted on the circuit-breaker board or as far away as desired, since the connections comprise but four small wires.



Reverse-Current Relay Circuit Diagram

The Ohio Brass Company, Mansfield, Ohio, has recently applied for a patent on its style O-B Type X strain insulator. This device is made of high-voltage porcelain, which is denser and stronger than the dry ware commonly used for this class of insulator. Because of its high mechanical strength and long leakage path this insulator is claimed to be ideal for dead ending and guy wire service.

DIFFICULTIES IN THE MANUFACTURE OF MANGANESE STEEL CASTINGS

Since the publication of the article entitled "Chicago's Experience with Solid and Insert Manganese Steel Special Track Work," on page 970 of the ELECTRIC RAILWAY JOURNAL for May 2, 1914, a representative of this paper has had talks with experts prominent in the manufacture of manganese steel. The following statements set forth some of the difficulties experienced in the manufacture of manganese steel castings:

Manganese steel foundry practice is, in many ways, similar to ordinary steel foundry practice, but the successful production of manganese steel castings involves a number of factors, not vital in ordinary work. It is of prime importance, if good results are to be obtained, that attention be given to the excessive shrinkage of manganese steel, in both pattern shop and foundry. From the molten state to the solidified casting, manganese steel shrinks approximately 5/16 in. in 12 in. as against 3/16 in. to ¼ in. in 12 in. in ordinary steel and iron castings. The provision made for shrinkage is not confined to that allowed in the dimensions of the patterns. Careful feeding is necessary to insure proper distribution of the metal in the casting. This is important since the heat treatment and solidification in the mold produce not only internal strains, which must be provided for, but variations in the density of the finished casting also. This variation in density, so serious a fault in the wearing surfaces of track special work, has done much to make many engineers dissatisfied with manganese steel for this purpose. In castings having thin webs it is necessary to increase the feeding sections to at least ¾ sq. in., and in many instances good results necessitate the temporary addition of metal to enable the weak sections to withstand the shrinkage strains.

Other elements entering into the manufacture of manganese steel which may develop critical conditions are the maximum and minimum limits of the manganese content and its relation to the maximum and minimum limits of the carbon content. An ideal average analysis of cast manganese steel is about as follows: Carbon, 1.25 per cent; silicon, 0.30 per cent; manganese, 12.50 per cent; sulphur, less than 0.02 per cent, and phosphorus, about 0.08 per cent.

If the proportion of manganese rises above 14 per cent or falls below 7.5 per cent, the effect of the annealing process on the finished casting is to make it brittle or otherwise undesirable for the uses for which it was designed. When the manganese is 12.5 per cent and the carbon is higher than 1.45 per cent, the annealed casting is too brittle for practical purposes. In order to keep the chemical composition uniform, the content of each heat is limited to about 3 tons.

The proper composition of each heat is obtained by weighing the metal from the primary melting cupolas before it is poured into the converter ladle. The 80 per cent ferro-manganese, with which the steel is alloyed, is melted in crucible furnaces, carefully weighed and placed in the bottom of a converter ladle. To insure accurate proportioning of steel and manganese alloy, the empty ladle is first weighed and afterward the slag skimmed off, and that remaining in the ladle after the metal has all been poured out is also weighed. This procedure results in a chemical composition sufficiently uniform for practical purposes.

The principal difficulty with the finished product seems to be caused not so much from a lack of uniformity in the chemical composition as in a lack of the necessary care in the preparation and feeding of the molds. As the excessive shrinkage makes large gates and risers necessary, the castings must be fed liberally to assure a uniformly dense finished product. The location of the points of feeding, and the thickness of the channels through which the heavier sections are fed have an important relation to the quality of the finished product. Too rapid cooling of thin sections must be prevented as this creates internal stresses and affects the density of the heavier sections, especially when the latter are at the bottom of the mold, as is the ball of the rail in the case of track special work.

When the finished casting is taken from the mold it is very difficult to discover the internal strains and the variations in density of the metal, because the outer surfaces solidify as they come in contact with the mold and mask the internal conditions. The cold rolling and cupping referred to in the discussion of Chicago's experience with manganese steel special work were presumably due to this variation in density. It is probable that the marked cupping at joints and at intersecting acute-angle flangeways was due to low density, in turn chargeable to improper feeding. In many instances track special-work pieces are poured from the

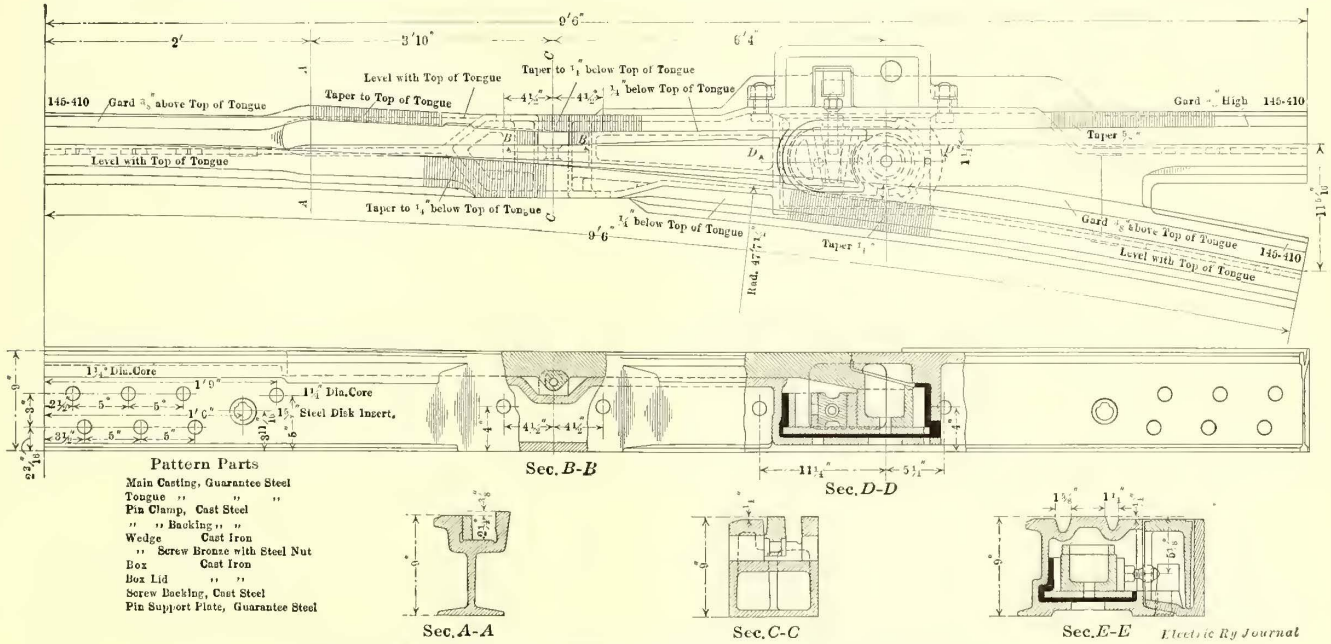


Fig. 1—Example of Solid Base Single and Double Web Support

ends, and the shrinkage strains develop at the gates or risers or else the metal in the finished casting immediately adjoining either the gate or the riser is spongy or not of proper density. Conditions of this kind, it is believed, account in a large measure for pronounced cupping at joints. The effects of the use of too few gates and risers and of improper feeding are similar to those met with in ordinary foundry practice, exaggerated by the excessive shrinkage of manganese steel.

While it is believed that the presence of soft or spongy metal, resulting in cold rolling and serious cupping, is due to improper foundry practice, chipping and crumbling are attributable principally to the annealing and quenching process. All castings, after removal from the molds and cleaning, must be annealed before they are of use for practical purposes. An exception to this rule, however, is in the case of very thin castings which are sufficiently chilled in the molds to become properly tempered. Annealing and quenching make the castings ductile and tough. The temperatures required for the process vary from 1600 to 2200 deg. Fahr., the ideal value being approximately 1800 deg.

All rough castings, as they come from the mold, are placed in annealing ovens, where the temperature is raised to approximately 1800 deg. When all the castings have been uniformly heated they are removed from the oven and immersed in a quenching tank. At this point in the process an opportunity arises for improperly tempering. Particularly in small castings it is possible that the time required to remove them from the annealing oven to the quenching tank may be sufficient to allow the temperature to drop to a value at which the quenching process makes them somewhat brittle.

Depending on the size and character of the castings, which may vary in thickness up to 5½ in., it requires from four to twenty-four hours to accomplish the annealing properly. Even with the most careful annealing, however, it is impossible to eliminate the effect of segregation at intersecting flangeways of solid manganese-steel crossings. Internal stresses and blowholes may also occur at these critical points, thus lowering the elastic limit of the material.

The physical characteristics of good quality manganese steel are similar to those of any high-grade steel, its elastic limit being approximately 58,000 lb. per square inch, the tensile strength, approximately 92,000 lb., the per cent elongation in 2 in., 26.9, and the per cent reduction of area, 27.02. In the early stages

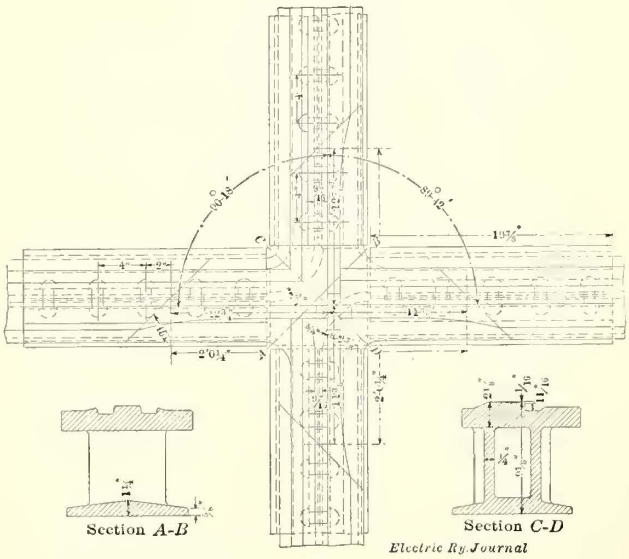


Fig. 2—Solid Base With Double Web Support

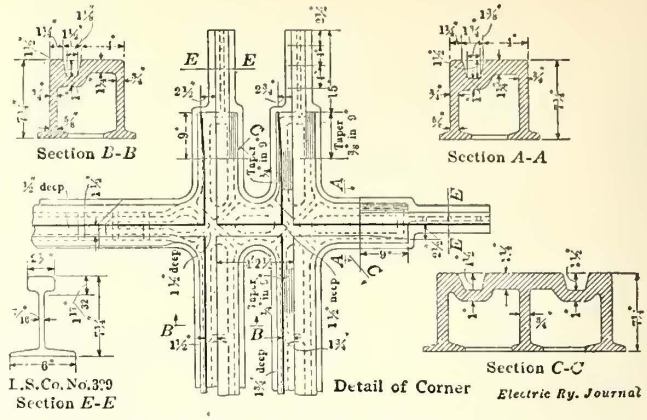


Fig. 3—Channel Web Supported Hard-Center Crossing Installed by Pacific Electric Railway at Los Angeles

of the use of manganese steel for track special work it was believed that advantage could be taken of its excellent physical characteristics and that the sections of metal could be less than those necessary with ordinary steels. This was a mistake, however, as such procedure interfered with successful foundry practice. Recent development along this line has included the limiting of the supporting web thickness to at least ¾ in. In fact, in the standards recently issued by the Manganese Track Society for solid and rail-bound steam railroad frog designs, the limitation of dimensions was the most important factor presented. On the other hand, it is evident from Chicago's experience, that the limiting dimensions are not the only factor responsible for the lack of uniformity in castings. It is believed, however, that if the webs are thickened to a ¾-in. minimum limiting dimension, the foundry operations will be facilitated.

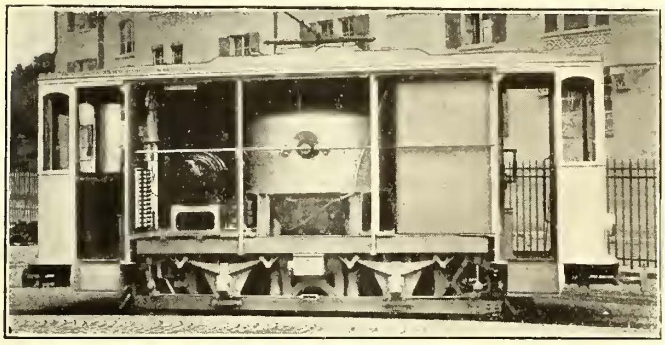
The accompanying figures illustrate some of the important points made in the above paragraph. Fig. 2 is an example of a right-angle crossing, supported as shown in section *C-D*. While the web thickness is here ¾ in., it is believed that internal stresses of a more or less serious nature will develop in the solid base which forms the top of the casting in the mold, unless great care is taken to feed the casting properly. In contrast to this, in Fig. 3 is shown the ideal method of supporting a right-angle intersection. This is the boxed-web-support construction used for three years successfully by the Pacific Electric Railway at Los Angeles, Cal. This boxed-in, supported flangeway type, or channel, construction, was adopted in order to get a more uniform distribution of the metal in the castings and to obviate bending of the castings at the intersections. It was believed that non-uniformity and bending contributed to crystallize the metal, resulting in cracks and breakage. Since the design was changed no breaks have occurred after service of three years, whereas failures had occurred in the unsupported intersections under similar service.

Fig. 1 shows a solid manganese switch of the sections shown at *A-A*, *C-C* and *E-E*. While in actual service this type of construction has proved superior to insert work, evidences of spongy metal or low proper density in the wearing surface have been common in individual pieces. This is principally attributed to the use of the single-web support in portions of the piece, as well as of the completely boxed-in support at other points. Here again the proper feeding of the casting is very important in bringing about satisfactory results. As an aid to improving foundry practice, however, a channel support throughout the casting, with transverse webs, is considered more desirable.

ZURICH SUCTION CAR FOR CLEANING GROOVED RAILS

Since May, 1913, the Zurich Municipal Railways have used the suction type rail cleaning car shown in the accompanying illustrations. The car was furnished by the Vereinigte Isolatorenwerke A-G, Berlin-Pankow, Germany, in accordance with the specifications of the railway. The car is equipped with one pair of scrapers for each direction of running. The scrapers are under the control of the motorman so that the necessary variations in height may be made in clearing special work. The intakes above the scrapers cover the head and groove of the rail so closely that while the suction is powerful enough to take up stones as large as a man's fist it will not disturb loose pavement adjacent. The motor exhauster is operated at 500 volts d.c. with a range in speed of 1150 r.p.m. to 1680 r.p.m., corresponding to outputs of 8½ hp to 16½ hp. The capacity of the dirt tank is about 32½ cu. yd., which is sufficient for a trip of 6 to 6½ miles.

A sprinkler tank of 5 cu. yd. capacity is also provided to prevent dust. The degree of sprinkling is under the control of the motorman. Measuring devices show the amount of water in the tank and the vacuum in the suction system. An electric alarm advises the motorman when the debris tank is full. The traction equipment consists of two 38-hp Oerlikon motors, two controllers with electric braking features, hand brakes and electro-magnetic track brakes. The car carries the dirt some distance out of town, whereas formerly the material was piled up at various places in the streets waiting removal by the street cleaning department.



Side of Rail-Cleaning Car Removed to Show the Mechanism, the Refuse Tank, etc.

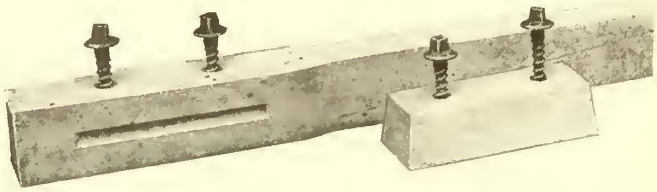
The Zurich system comprises about 48 miles of single track, of which one-third is cared for by this car during a normal working day. As the car is operated at an average speed of 9.3 m.p.h. it does not interfere in any way with the regular passenger service. According to F. Largiader, manager of the system, the total cost of the completely equipped car was approximately $6,600. Its weight when empty is 13 metric tons. Mr. Largiader figures the annual saving at $4,500, after making proper allowance for capital and renewal costs.

C. W. Mallins, general manager Liverpool (Eng.) Corporation Tramways, has prepared a plan for the construction of a system of underground electric railways in Liverpool, estimated to cost $63,310,000. The plan provides for a belt system of tube railways encircling the city by junctions with the overhead railway; for radial lines running through the most populous districts; for an extension of the Mersey Railway to the Haymarket and for railway and general traffic tubes to Birkenhead and Seacombe forming junctions with the Wirral Railway.

REINFORCED CONCRETE TIES AND BLOCK FASTENINGS

Another important step toward more substantial electric railway track construction in both paved and open track is offered by the reinforced concrete tie and block rail fastening designs of the Percival Concrete Tie & Socket Company, Inc., New Orleans, La. In this system the rails are carried on intermediate blocks as well as on ties, with the result that the tie spacing can be made as great as 8 ft. without any likelihood of spread rails.

The block is 12 in. long, 4 in. thick and 3½ in. deep, is reinforced with 1 lb. of wire or miscellaneous steel and weighs 19 lb. Its two metallic non-corrosive sockets are said to be as permanent as the concrete itself. The block is firmly attached to the base of the rail by means of ⅞-in. x 5-in. wide flange head screw spikes. The concrete ties for paved streets are 6 ft. to 7 ft. long. They are 5 in. thick and 3½ in. wide in the center, but for 14 in. at the ends they flare out to a width of 4 in. and a thickness of 5 in. This tie is reinforced with two ⅜-in. x 5½-ft. to 6½-ft. corrugated steel bars, and its total weight is 135 lb.



Reinforced Concrete Tie with Intermediate Block Fastenings to Permit 8 ft. Tie Spacing

For open track construction on interurban lines, bridges and viaducts, a 280-lb. to 300-lb. tie is used. This tie is made with a V-shape center to prevent center binding, and is reinforced with three ½-in. and one ⅞-in. corrugated steel bars which are wired together in the form of a truss. A 2-in. creosoted wood cushion is inserted between the rails and the tie and the rails are secured by a ⅞-in. x 7-in. wide flange head screw spike that passes through the wood cushion into a non-corrosive metallic socket which is imbedded in the concrete tie.

A most valuable feature of this form of reinforced concrete construction is that the ties and blocks may be made by unskilled labor along the right-of-way at whatever shelters the railway stores its equipment. In this form of construction the rails can be held in surface and alignment while the roadbed is under construction. The completed job is a monolith composed of the ties, blocks and of the concrete which was poured around them.

CONVENTION OF THE OKLAHOMA ASSOCIATION

A meeting of the annual convention of the Gas, Electris & Street Railway Association of Oklahoma was held in Oklahoma City May 13 to 15. There was an attendance of about one hundred delegates. The subjects discussed related almost entirely to electric lighting. The officers elected for the ensuing year were: President, George W. Knox, Oklahoma City; vice-presidents, W. J. Dibbins, Guthrie, and H. S. Cooper, Weatherford; secretary-treasurer, Prof. H. V. Bozell, Norman; directors, the officers and Lincoln Beerbower, Enid; C. S. Dawley, Okmulgee, and W. R. Molinard, Oklahoma City.

News of Electric Railways

Council to Get Kansas City Franchise June 1

As a result of recent developments in the Metropolitan Street Railway situation in Kansas City, it is probable that the franchise will go to the City Council about June 1. The grant, it is expected, will be in Council about twenty days before a special election is called for the purpose of having the people vote on it. Several questions were tentatively settled recently. The question of how much the Metropolitan Street Railway should contribute to the cost of the viaducts built by the Terminal Railway is pending. The receivers for the company agreed to pay one-third of the cost, in lieu of one-half, as provided for originally. This settlement, however, is not satisfactory to the city representatives and probably will be decided by the courts. Fares for adults will continue at 5 cents. Six tickets for a quarter is the rate probable for all children more than seven years old and less than fourteen years. Children under seven will ride free, according to present indications. The sentiment of the conferees was that service is the paramount question at present and that reduced fares for adults must come later, if at all.

The labor question was discussed and the following clause adopted: "In the employment of its servants the company shall not discriminate either in favor of or against any one because of his affiliations with labor organizations. This clause may be enforced in any appropriate proceedings by any person affected."

Consideration of extensions brought delegations from all sections of the city. If the franchise is awarded to the company the following extensions, aggregating 15.71 miles, will be constructed:

Twenty-fourth, Brighton to Hardesty	.50
Broadway, Fourteenth to Twenty-fourth	1.80
Brooklyn, Thirty-ninth to Forty-third	1.00
McGee Street, Nineteenth to Twenty-fourth	1.07
Prospect, Fifteenth to Independence, to Chestnut to Lexington	2.22
Main Street, Nineteenth to Twenty-seventh	1.52
Station Plaza, Main to Broadway	.54
Twenty-fifth, Broadway to Summit	.46
Broadway, Twenty-fourth to Twenty-fifth	.16
Mail spur	.14
Twenty-fourth Street, Main to McGee	.38
Woodland Avenue, Missouri to Tenth	.50
Blue Valley line, Fifteenth to St. John, Belmont, single track	1.45
Indiana Avenue, Thirty-sixth to Forty-third	.875
Thirty-first, Indiana to Jackson	2.00
Jackson to Raytown Road, single track	.233
Twenty-fifth, Troost to Grand Avenue, single track	.611
Brooklyn Avenue, Forty-third to Forty-fourth	.250
Total	15.71

The methods of handling interurban traffic into Kansas City also provided much discussion, without any definite agreement as yet. Mayor Jost's plan was to authorize some private corporation, or some company as yet non-existent, to build a central interurban depot, without designating the location. The interurban representatives opposed the plan until the location should be decided. The interurbans, it was decided, should charge a 5-cent fare in Kansas City, all of this to go to the Metropolitan Street Railway. If a company other than the Metropolitan Street Railway builds the interurban depot, this company will receive 1 cent of this 5-cent fare.

The kind of cars to be operated by the interurban railways also caused some friction. Representatives of these companies objected to the specifications contained in the franchise, while the city representatives refused to allow the interurbans to use their own discretion in constructing or operating cars. A committee of three men, representing the Metropolitan Street Railway, the interurban railways and the city, finally was appointed to decide this question. The attitude of the interurban railways was that the kind of cars operated should be left to the Missouri State Public Utilities Commission. It was definitely decided that interurbans shall carry only passengers whose destinations are outside of the city limits. In exchange for the concession of the 1 cent of the fare the interurbans have received up to the present, the Metropolitan Street Railway will take entire charge of interurban cars entering the city and will be liable for damages of any kind which arise from their operation.

Robert P. Wood, electric railway engineer, will succeed L. R. Ash on the city board of control to be named under the proposed franchise for the Metropolitan Street Railway.

Toledo Franchise Committee Reports

At a meeting of the Toledo City Council on the evening of May 25, the special franchise committee reported its failure to reach an agreement with the Toledo Railways & Light Company on the rate of fare. Henry L. Doherty, the report stated, has steadfastly refused to accept a fixed rate of fare of 3 cents for the entire period of the franchise and has insisted upon the plan of operating for one year at that rate with a provision for a readjustment at the end of each five-year period thereafter. The committee stated its reasons for insisting upon a 3-cent fare for the full twenty-five-year period as follows:

"First. The proposed 3-cent fare for one year would not afford a practical test of such a rate of fare, for the reason that the contemplated new rearranged street-railway system, including the elimination of competing lines and the completion of the cross-town lines and needed extensions of various lines, which would greatly reduce the cost of operation and the handling of business would not be completed and in operation. Without this no actual and practical test could be made.

"Second. At this time the city is dealing with a company operating practically all its lines by sufferance and can continue to operate its lines only with the consent or indulgence of the city, whereas a year hence, under the company's proposal, the city would then be dealing with a company vested with and enjoying all the rights and privileges of a franchise, clothed with the right to appeal to any jurisdictional court to determine and fix the fare for any subsequent five-year-period, if the fare which Council should fix should prove unsatisfactory to the company, and thus place the responsibility and right of fixing fare entirely in the hands of the company, leaving the city powerless to protect itself. The company, in attempting to meet this objection of the committee, suggested a referendum vote to the people on the rate of fare ordinance whenever adopted by the Council, but this would not protect the carriers should the company wish to go into court and have the court determine, from the company's books and the company's own method of charging up expense, what the rate of fare should be.

"Third. The committee further rejected the company's proposal on the fare question, because it would keep the franchise question constantly in politics and induce the company to become an active and probably a controlling factor in the election of councilmen, especially in the years of a revision of the fare.

"Fourth. At the present time the company is operating without any substantial franchise rights, thus placing the city in the most favored position to deal with the company in exercising authority and judgment in determining the terms and conditions of a franchise to be granted the company, and therefore the committee considers the existing conditions under which to determine the fare question better than to postpone such an important question to a date when the company would be vested with the full franchise privileges, which would necessarily place a great handicap upon the power and authority of the city to deal with the question."

Some of the concessions made by the committee were enumerated and it was stated that these steps were taken on the assumption that the low fare would follow. Special stress was placed upon the right to be granted to the company to carry freight over the city lines between the hours of midnight and 5 a. m. and the authority to make such contracts with the interurban railways as seemed best to the management.

It was finally agreed that the Council should resolve itself into a committee of the whole to consider the franchise question further and that negotiations should be resumed if possible. The special franchise committee will be retained to take up any new questions that may arise in connection with the matter.

The first meeting of the Council committee of the whole took place on the following evening, with Vice-Mayor Hassenzahl in the chair. Many phases of the street railway question were dismissed, although a resolution was adopted in the beginning to confine the discussion to the rate of fare. The session ended with a promise from the president to call another meeting on the evening of May 28.

At the meeting on May 26 it was announced that H. W. Jones, Cleveland, representing local and foreign capital, was prepared to enter a bid for a franchise on the basis of 3-cent fare. It is understood that A. K. Detwiler, Toledo, is to head the group represented by Mr. Jones. Mr. Detwiler qualified this by stating that he was arranging his affairs so as to retire from active business, but that he would probably be willing to join a syndicate for this purpose.

Henry L. Doherty was the first speaker at this meeting. He reviewed the work done by the franchise committee and representatives of the company and referred to the necessity of having an agreement on all other questions first, if the city insists upon a fixed fare for the franchise period. The only source of increased revenue to be found in the concessions of the franchise committee of the Council was the right to carry freight at night. The return this privilege would yield was uncertain. The tendency under it would be to bring factories into the city rather than for them to locate along the railroad lines in order to secure freight facilities. Mr. Doherty said that asking for 3-cent fare with the city in control of operation, the committee sought to impose a condition that has not been exacted anywhere else in the United States. He further expressed the belief that the people wanted good service. If they could have it at a fare of 3 cents, they would be pleased, but if not, they were willing to pay more. Speaking further on the question, he said:

"If we accept a fixed 3-cent rate and service is placed in control of the city, we will not be able to borrow money to build crosstown lines and make improvements, because people will not lend money on a thing not proved possible. Under our ordinance we will be able to get this money and you will get 3-cent fare, if additional revenue makes it possible."

It is possible that the company will abandon its plan of carrying people free when they refuse to pay the old rate of fare. Only the rougher element is taking advantage of the free rides now. Considerable disorder is created by hoodlums, especially on Sundays. Conditions at Walbridge Park last Sunday are said to have been particularly bad.

Mr. Doherty says that the steps taken recently indicate that negotiations will now proceed with the Council as a committee of the whole in much the same way as with the special committee, but with the rate of fare as the principal topic.

The publicity forum being conducted by the company, to which reference has been made previously in the Electric Railway Journal, was resorted to by it "so the people may know and then judge for yourself." In opening the forum the company said that it "hoped to demonstrate that this method can be used to bring about the best solution of every problem which the future holds for Toledo." In all its advertisements the company asked for letters of criticism of its franchise proposal and not for letters of commendation, but in spite of this less than 10 per cent of the great volume of letters that has poured in to the company have been letters of criticism.

The company published the proposed ordinance in full and then invited criticism, offering prizes for the best statement of objections. In announcing the plan for the forum the company said that the first thing that confronted it was to find a plan that would insure both good service and low fares. The second was the matter of determining what the public wanted as to service and fares. Good service could not be had at the lowest possible fare nor could the lowest possible fare be had with the best service. The real object was to determine the relation between fares and service that would suit the people best. And so the company has since been answering in full page advertisements in the papers the criticisms leveled at it.

It is quite impossible fairly to convey a general idea of the lines which the critics have followed. They have directed their darts from all angles. Even the few scurrilous attacks have been met by the company. It was no doubt a rude shock to one man who attacked the company without reason to have his letter reprinted in full. In this particular case the company expressed its wonder at the number of people in Toledo who were likely to be led and influenced by men of the character of the writer.

On May 22 the company answered an editorial in the *News-Bee*, which has been hostile to the company's proposition from the start. The company reproduced at the side of its answer to this criticism the masthead of the *News-Bee* and the editorial in question, together with other editorial matter of no bearing on the franchise situation. This editorial went on to say that the question of fare was a big thing to guess on. It quoted the varying rates of fare in Cleveland, Columbus, Detroit and Cincinnati and asked: "Who is wise enough to make terms that will be equitable for twenty-five years." The editorial plainly indicated the influence for good which the company's campaign has exerted even on the editor of a hostile paper, and Mr. Doherty said as much in his reply. Mr. Doherty said that he had always contended that the city officials had no way of knowing what the correct rate of fare should be. He then proceeded to show that the plan which he advocated provided for periodic fare adjustments and that the control of service determined in a large measure what the rate of fare should be.

The Dublin Strike

At the recent general meeting of the shareholders of the Dublin (Ireland) United Tramways William M. Murphy, chairman, presiding, reviewed the story of the Larkinite effort last year to bring about a strike on the company's system at a time when the Syndicalist conspirators believed they could accomplish the greatest amount of injury to the company's service and inflict a maximum of discomfort and annoyance on the general public. Owing to the combined troubles arising from the strike movements in Dublin the total receipts in 1913, as compared with those in 1912, were reduced by £21,099 16s. 11d., the company having had to work under abnormally difficult conditions for about four months of the year. The chairman recalled the speech he delivered to the men in the company's service on July 19 last before Larkin delivered his "word of command" for a strike. On that occasion the chairman warned the men that if such a strike were attempted it would prove "Larkin's Waterloo." Mr. Murphy said that every warning he gave the men that night came literally true. Continuing he said:

"Though the company was amply provided with men after the first few weeks to carry on its full services, it was some time before the cars could be safely run when it became dark, and a good deal of the loss in receipts was due to this cause. The general strikes and unrest added greatly to our losses, which are probably twice as much as if the disturbance had been confined to the tramways alone. However, the result was worth all the sacrifice forced on the company. It has proved in a most striking manner the impossibility of Syndicalism succeeding under any circumstances if it is boldly grappled with. In this case there were unstinted monetary and food supplies from the organized workers of an industrial country with a population of 40,000,000 of people supporting a Syndicalist movement confined to Dublin in a fight against a handful of employers, and yet the Syndicalists failed.

"The net result of Larkinism during the last six months is that, after keeping this city in a state of turmoil and disturbance and nearly ruining its trade, there is not a single working man or woman in Dublin whose wages or conditions of employment have been improved in the least degree. So far from bringing any benefit to the working men, Larkin's campaign has brought nothing but untold misery on them and their families.

"I have no feeling of triumph over the utter defeat of the disruptionists, but I have the greatest commiseration for the victims of Mr. Larkin's ambition and their own folly. I get letters every day of the most pitiable character from men whom we should have readily re-employed if they applied in time, but who delayed so long that their places were filled and their names can now only be put on a waiting list.

"Though we have gone through such a trying time I have some satisfaction in the belief that it will be many a day before another strike takes place in this company. This consideration, however, will not prevent the directors from always giving sympathetic consideration to the just claims of their employees."

Mr. Mellen's Testimony Concluded

When the inquiry into the affairs of the New York, New Haven & Hartford Railroad was resumed on May 21 before the Interstate Commerce Commission Charles S. Mellen, former president of the company, was questioned by Mr. Folk in regard to the details of the purchase of the electric railways in Rhode Island. Mr. Mellen said that the New Haven did not want to buy the lines in Connecticut controlled by the interests identified with the United Gas Improvement Company, but that it did want to buy the lines in Rhode Island controlled by these interests. The lines in Connecticut were at Bridgeport and Waterbury, more than 100 miles from the lines in Rhode Island.

The negotiations for the purchase of the properties after being suspended were resumed at the instance of Senator Aldrich of Rhode Island. The New Haven finally purchased from the United Gas Improvement interests for $250 a share about $8,000,000 of the stock of the Rhode Island Company, the entire capital stock of which was originally owned by the Providence Securities Company. Previous to putting through this deal the New Haven had secured by purchase 25 or 30 per cent of the securities of the United Traction & Electric Company which owned all the principal companies in Providence and leased them to the Rhode Island Company. Mr. Mellen said that this was a very involved transaction and "enough to give a man a headache to think of it." Under the agreement with the owners of the Rhode Island Company they were to assess themselves so as to leave $1,200,000 of cash in the treasury out of which the New Haven was from time to time to meet the assumed or estimated deficit. This was absorbed at the end of half a year instead of five years. Mr. Mellen estimated the cash deficit of the Rhode Island trolleys since their purchase eight years ago by the New Haven to be approximately $2,500,000, or about $300,000 a year.

In attempting to acquire all of the electric railways in Rhode Island, Mr. Mellen was trying to obtain control of the trolleys contiguous to the lines of the New Haven Railroad. He believed that the railroads were going to be operated by electricity and that great economies could be worked by erecting large power houses to furnish electricity for both systems of transportation, meaning those already conducted by electricity and those conducted by steam. The two systems of transportation were closely related and should be supplementary, and not competitive. The electric railways took from the railroads a certain class of business that was unprofitable to the railroads. Mr. Mellen was confident that he was right, but he was opposed by the public because of the fear that too much power would be put into one man's hands and the public be injured. In this respect the public was acting against its own best interests.

According to Mr. Mellen the cost of separate units in a large system was not material. It was the aggregate cost per mile on the whole proposition when completed that should be looked at. If authority and economy were to be had the control of the transportation systems in the United States must be in large units such as was contemplated in New England or the inevitable result would be control by the government. Mr. Mellen thought that he had been working toward government control, perhaps unconsciously. It would not be good from the public standpoint for one railroad to own stock in another except by authority of some public body after an investigation and determination of the public interest.

Mr. Mellen thought the first electric railway which the New Haven company bought in Massachusetts was the Worcester & Southbridge in 1904. The road was then in the hands of a receiver. After that the company bought the Springfield Street Railway. It then built the link connecting the Worcester & Southbridge line with the Springfield system. The railway system in Worcester was next taken over. The purchase of the Berkshire Street Railway followed this. These lines comprised the electric railway systems acquired by the New Haven Railroad up to the time of the decision of the Massachusetts court. They were all held by the Connecticut Voluntary Association. This association had $4,000,000 of preferred stock and $100,000 of common. The $4,000,000 of preferred stock elected three trustees and the $100,000 of common stock elected four trustees. In this way the New Haven elected four of the seven trustees and so controlled the property. Mr. Mellen said that he controlled the Connecticut Voluntary Association personally, notwithstanding the decision of the Supreme Court of Massachusetts. Mr. Mellen affirmed that his ultimate aim in bringing about all these consolidations was better service at lower rates. He believed the public was better served by a monopoly of transportation than in any other way. The only thing necessary in case there was oppression was action by the government.

Mr. Mellen tried to keep clear of the legislators. He said there was not half the attempt on the part of railroad people to control legislation and to have relations with the members of the elected legislatures that there was on the part of the members of the elected legislatures to have relations with the railway officials. The rest of the testimony on May 21 had to do largely with the New Haven maritime transactions.

The examination of Mr. Mellen was concluded on May 22. He told first about the financing of the Tarrytown, White Plains & Mamaroneck Electric Railway. The New Haven acquired this property for $953,000. Much of the purchase price represented franchise value, and while the road had been piling up a deficit yearly its future possibilities were excellent. In acquiring the electric railways at Worcester Mr. Mellen thought that $10 a share more was paid to William A. Read & Company for their holdings in the company than was paid for the holdings of others in the company. Mr. Mellen referred to this deal as a "hold-up." During his testimony in regard to the purchase of the electric railways Mr. Mellen said that sometimes he went to bed at night and thought over the things that might have come out at the investigation and did not and that he sighed and turned over and was glad these things did not come out.

The Interstate Commerce Commission on May 26 postponed its further examination into the affairs of the New York, New Haven & Hartford Railroad until June 3. In the meantime Commissioner McChord says the books of J. P. Morgan & Company and personal papers of the late J. P. Morgan will be inspected in behalf of the commission. Commissioner McChord has accepted the offer of Lewis Cass Ledyard to testify without immunity.

William A. Read & Company have issued a statement in regard to the Worcester purchase in part as follows:

"We and our clients, who are large holders of Worcester Railway & Investment Company stock, declined the offer of $105 a share made to all holders of the stock at the time that the New Haven road purchased the majority of the stock. Several years later, when the New Haven road introduced a bill in the Massachusetts Legislature to permit that road to own the Massachusetts electric railways we notified the company, through counsel, that we intended to oppose this bill, because it would be detrimental, in our judgment, to the interest of the minority stockholders. We were advised by counsel that the proposed legislation was unconstitutional and we proposed to oppose it upon that ground. Thereupon the New Haven road agreed that if we would withdraw our opposition to the proposed legislation, they would purchase our stock at the price which had been paid several years before to other stockholders, plus the interest which had accrued in the meantime—equivalent to about $115 a share. This agreement was made, but the transaction never went through."

Underground Railway Resolution Adopted in Detroit

The Detroit Street Railway Commission has adopted the following resolution:

"*Resolved*—That the officers of this board be instructed to proceed at once with all steps necessary to the preparation of plans for a subway system in Woodward Avenue from Jefferson Avenue to Milwaukee Avenue, in Michigan Avenue west to Junction Avenue, and in Gratiot Avenue east to Chene Street, to connect with the workingmen's belt line now in course of construction, and be it further

"*Resolved*—That such subway be constructed by the city of Detroit and placed in operation as soon as possible."

The board has instructed Secretary Jay G. Hayden to prepare a communication to the Common Council, asking that body's approval of the plans for the system. An-

other resolution which has been adopted directs the officers of the commission to locate at once a site for a municipal power house to generate electricity for the municipal subway lines.

Contracts for Construction of East River Tunnels

Bids for the construction of the most important contracts of the dual system of rapid transit were opened by the Public Service Commission for the First District of New York during the week ended May 23. These were for the two East River tunnels from downtown Manhattan to Brooklyn. One is for operation by the New York Municipal Railway Corporation and the other for operation by the Interborough Rapid Transit Company. The former runs from Whitehall Street, Manhattan, to Montague Street, Brooklyn, and will connect the Broadway subway in Manhattan with the Fourth Avenue subway in Brooklyn. The latter runs from Old Slip, Manhattan, to Clark Street, Brooklyn, and will connect the Seventh Avenue subway in Manhattan with the existing subway in Brooklyn. Seven bidders filed proposals, five of them bidding for both tunnels. The lowest bid was that of Booth & Flinn, Ltd., and the O'Rourke Engineering Construction Company, who offered to construct both tunnels for about $12,444,725. On May 27 they were awarded the contract by the commission. The next lowest bidder was the Holbrook, Cabot & Rollins Corporation, which offered to build both tunnels for about $12,677,000. The other bidders were the Degnon Contracting Company, Smith, Hauser & McIsaac, the Rapid Transit Subway Construction Company, the Oscar Daniels Company, all of New York City, and the Keystone State Construction Company and Paul G. Brown, Philadelphia, Pa.

The commission has awarded the contract for the construction of Section No. 2 of Routes Nos. 4 and 36, the Broadway subway in Manhattan, to the U. S. Realty & Improvement Company, for $2,657,004. This is that part of the Broadway subway lying between Twenty-sixth and Thirty-eighth Streets, and includes a local station at Twenty-eighth Street and an express station at Thirty-fourth Street. The line, which will be operated by the New York Municipal Railway Corporation, is already under construction south of Twenty-sixth Street.

During the week ended May 23 the commission opened bids for the work of installing the tracks in the Fourth Avenue subway in Brooklyn. On the official totals the Thomas Crimmins Contracting Company was the lowest bidder, at $212,880.

The commission has adopted the form of contract for the construction of Section No. 1 of Route No. 12, and has authorized the chairman and secretary to advertise for bids thereunder, to be opened on June 16. Route No. 12 is the Eastern Parkway subway, and Section No. 1 begins at the present terminus of the existing subway, at Atlantic and Flatbush Avenues, Brooklyn, and runs thence under Flatbush Avenue to a point about 274 ft. southeast of St. Marks Avenue, where it joins Section No. 1-A, the contract for which has already been awarded.

The commission has adopted the form of contract for the construction of Section No. 7 of Route No. 5, the Lexington Avenue subway in Manhattan, and has authorized the chairman and secretary to advertise for bids thereunder, to be opened on June 12. Section No. 7 begins near the southerly line of Forty-third Street and extends northerly under Lexington Avenue to a point about 50 ft. north of the center line of Fifty-third Street. North of the latter point the Lexington Avenue subway is entirely under contract.

The contract for the construction of Section No. 6-A of Routes Nos. 4 and 38, the Seventh Avenue subway in Manhattan, has been awarded to the Holbrook, Cabot & Rollins Corporation, at $421,566. This section covers the connection between the new Seventh Avenue subway and the existing subway at Times Square. The Commission advertised for bids twice for this section. The first bids were opened in March, when the Oscar Daniels Company was the lowest bidder, at $304,316. After those bids were received the Interborough Rapid Transit Company protested against the award of the contract to the Daniels Company, on the ground that it had not a proper conception of the work and had not allowed a sufficient amount for the protection of the traffic in the existing subway. In the first bidding the Rapid Transit Subway Construction Company, which is owned by the Interborough Company, the lessee of the subway, was the third bidder. Bids were opened again on May 13 last, when the Holbrook, Cabot & Rollins Corporation was the lowest and the Rapid Transit Subway Construction Company the next bidder. Following the opening of these bids the Interborough Company again protested against the award of the contract to the Holbrook, Cabot & Rollins Corporation for the same reasons as advanced against the Oscar Daniels Company. The commission conferred with all parties in interest, and then decided to award the contract to the Holbrook, Cabot & Rollins Corporation.

On May 27 the commission also awarded the contract for the construction of Section 2 of Route 20, which is a part of the Canal Street crosstown subway in Manhattan to the Underpinning & Foundation Company, the lowest bidder at $1,822,994. This section will connect the Fourth Avenue subway tracks on the Manhattan Bridge with the Broadway subway and will be operated as a part of the Brooklyn Rapid Transit system. There will be a station extending from Centre Street nearly to Broadway.

Mayor Dahlman on the Omaha Low-Fare Ordinance

Mayor Dahlman of Omaha, Neb., was quoted as follows recently in regard to the injunction secured by the Omaha & Council Bluffs Street Railway restraining the city from enforcing the ordinance requiring the Omaha & Council Bluffs Street Railway to sell seven tickets for 25 cents recently voted on under the initiative and referendum law:

"I am not in sympathy with these socialists or others who seek to reduce the fares charged by the company. In the first place, I do not believe that seven fares for a quarter can be established as a fair rate, sufficient to give the company a fair return upon its investment. I think any money spent to uphold that ordinance is so much money wasted. In any case, I am not in favor of lower fares. As I see it, many fares are paid by transients. If the company is making an excessive profit, the thing to do is to levy a higher occupation tax. Let the company collect the 5-cent fare from all its patrons, transients and citizens, and then we will collect the excess profit in the form of an occupation tax. My own interest in this seven-for a quarter case was to affirm the city's right to regulate the company. I am not in favor of having the power to regulate given to a board at Lincoln. The city should have the right and the court has said we've got it. That's all I care to say about the seven for a quarter case."

H. T. Clarke, Jr., chairman of the Nebraska State Railway Commission, in referring to the possible valuation of the property of the company by the commission, said:

"If the court grants our right to value the property of the company we will not hesitate in going about it at once. It is the only property in the State that we believe we have a right to value, upon which we have no figures in our records."

Philadelphia Transit Agreement Submitted

A. Merritt Taylor, head of the department of city transit of Philadelphia, Pa., submitted the agreement upon transportation improvements in Philadelphia at a conference on May 27 of the Council committee and a meeting of the directors of the Philadelphia Rapid Transit Company. Mr. Taylor also made public the terms of the tentative agreement between the city and the company under the proposed contract for a modern high-speed system of subway and elevated lines. The program provides for the expenditure of $63,000,000. As summarized in the Philadelphia *Ledger* of May 28 the agreement provides for the construction and ownership by the city of the Darby and Frankford extensions of the Market Street elevated and the Broad Street subway. These lines are to be equipped and operated by the company. In addition, a tunnel under the Delaware to Camden is to be built by the holders of the franchise and leased to the Philadelphia Rapid Transit Company, which will operate it in connection with the Market Street service, but with an additional fare of three cents.

This contemplates an outlay by the company of about $12,000,000 and by the city of about $45,500,000. From the net earnings of the high-speed lines there will be deducted certain preferential payments, namely, an amount equal to 6 per cent on the company's investment for equipment, and after ten years a further 1 per cent to go into a sinking fund to extinguish the cost of this equipment, the payments to cease on the extinguishment of the debt; also a carefully guarded payment to reimburse the company for any falling off in the net income of the present system due to the diversion of traffic to the city-owned high-speed lines. After these deductions, the city will receive its interest and sinking fund accruals, and any surplus will be divided between the city and the company in proportion to their relative investments therein.

The next important point is the abolition of exchange tickets and the establishment of practically universal free transfers between the surface lines and between the surface and high-speed lines, the design being to enable a passenger to make a forward journey between any two points in the city for 5 cents, fares involving transfers from city-owned to company-owned lines and vice versa to be divided half and half. The elimination of exchange tickets is to be effected on Jan. 1, 1916, in all excepting the "delivery district," that is, between Arch and Walnut Streets, and the Delaware and Schuylkill Rivers; and in the entire city on Jan. 1, 1920.

Future extensions are provided for by an agreement that the company is to equip and operate the Chestnut Street subway for the service of the Darby line when the overcrowding of the Market Street lines makes the construction of that subway a necessity, and the city is to have the right to require the equipment and operation on the above basis of any other rapid transit lines which the city may build, and to require the extension of surface lines. The Public Service Commission is made the arbitrator to decide whether such extensions as the city may order are likely to be reasonably remunerative.

For the facilitation of the plans the contract of 1907 is to be extended seven years; all dividends accrued on Rapid Transit stock up to Dec. 31, 1914, under the terms of that contract, are to be waived and canceled (they will amount to about $12,000,000), and the city in turn is to surrender to the company the accrual in sinking fund and permit the company to postpone payments to the sinking fund for ten years, the amount so surrendered and postponed to be made up by such larger payments after the ten years as will be required to produce the full amount in the sinking fund at the expiration of the extended contract. Further, the city is to relieve the company of the payment of tax on dividends, approximately $116,000 a year, for six years beginning Jan. 1, 1915.

The company is to have the privilege of re-routing its lines to enable it to take advantage of the economies that can be gained from the substitution of free transfers for exchange tickets; and the city is to have free access at all times to the books and accounts of the company and the right to audit the same. For the advantage of the abolition of exchange tickets the city pays about $700,000 in all.

Municipal Line Opened in Seattle.—Operation of the first division of Seattle's municipal railway system was begun on May 23. The line extends from the business part of the city to Ballard, a manufacturing district 4 miles south. Twenty-five tickets are sold for a dollar, but the cash fare is 5 cents. As noted previously in the ELECTRIC RAILWAY JOURNAL the city is negotiating for the purchase of the Seattle, Renton & Southern Railroad, which connects with the line that has just been opened.

Proposal for Elevated Road in Los Angeles.—The Board of Public Utilities of Los Angeles, Cal., has approved the notice of sale for a forty-year franchise for the proposed elevated railroad to be constructed from the rear of the Pacific Electric Railway's Sixth Street depot to San Pedro Street. The proposed franchise provides that the city may purchase the railroad at the expiration of the forty-year term. In the event the city does not exercise this option to purchase at the end of forty years it is provided that the franchise shall be extended for ten years, the city reserving the right to purchase during this ten-year extension of time upon two years' notice.

Proposed Municipal Line Extension in Seattle.—The City Council of Seattle, Wash., has authorized an issue of utility bonds in the sum of $500,000 to be used to construct an electric railway to parallel the Seattle, Renton & Southern Railway. Councilman Erickson and others take the attitude that the negotiations between the city and the officials of the company have dragged too long. They urge the immediate use of the general bond issue to the amount of $500,000 for the first part of the work. In case the deal for the purchase of the existing line is concluded soon, the proposed line will not be built.

Result of East Liverpool Arbitration.—The board of arbitration appointed to pass upon the questions in dispute between the East Liverpool Traction & Light Company, East Liverpool, Ohio, and its employees submitted its report and made its award on May 23. Motormen and conductors receive an advance of 1 cent an hour. The shop and powerhouse men receive no increase. Some slight changes were recommended in the operating conditions. F. A. Boutelle, Canton, Ohio, represented the company as its arbitrator, E. H. Farrell, Lisbon, Ohio, represented the men, and H. J. Eckley, Carrollton, Ohio, J. S. McNutt, Salem, Ohio, and C. C. Connel, Lisbon, Ohio, were appointed by the court.

Lexington Jovians.—The Lexington (Ky.) Jovian League held its first luncheon at Hotel Phoenix on May 16. Sidney G. Vigo, of the Middle West Utilities Company, Chicago, was the guest of honor and chief speaker. The activities of the order will for the present be devoted to the promotion of electric power in the great coal mining and agricultural sections of Kentucky, of which Lexington is the hub. The luncheons will be held on the second Tuesday of each month, and a "Kentucky Welcome" is extended to all traveling Jovians to stop over on that date. The officers of the local Lexington league are Prof. W. E. Freeman, president; C. J. Eaton, statesman, and J. B. Fitzgerald, who is secretary and treasurer of the Lexington Utilities Company, vice-president.

Accomplishments of Washington Commission.—Conrad H. Syme, corporation counsel of the District of Columbia, delivered an address recently in which he reviewed the work of the Public Service Commission of the District. In concluding his remarks Mr. Syme said: "I do not know how long it will take to solve the problems and to correct whatever evil may exist in our public utilities. I do know that the people of this District have a right to the very best and most adequate service that can be rendered and at the lowest cost, consistent with a fair return to the utilities on whatever money has been honestly invested in them and properly expended by them. It is our part to have faith and hope and courage and patience—to work and search earnestly and faithfully for what is right and just, and we need never fear the result."

LEGISLATION AFFECTING ELECTRIC RAILWAYS

MASSACHUSETTS

The bill requiring members of the Public Service Commission to give all their time to the work of the board has been read a third time in the House. The discussion centered upon the desirability of preventing its passage in order to retain the services of Commissioner George W. Anderson, reputed to be the most radical member of the board. The bill authorizing street railways to issue bonds, notes, etc., to a total 20 per cent in excess of their outstanding stock has been killed in the House.

PROGRAM OF ASSOCIATION MEETING

New York Electric Railway Association

Frank Hedley, president of the New York Electric Railway Association, has appointed the following committee to arrange the entertainment for the thirty-second annual meeting of the association which, as announced in the ELECTRIC RAILWAY JOURNAL last week, is to be held at Hotel Champlain, Bluff Point, N. Y., on Tuesday and Wednesday, June 30 and July 1: John J. Dempsey (chairman), Brooklyn; Charles R. Ellicott, New York; H. N. Latey, New York; Charles C. Castle, New York; W. T. Stanton, Schenectady, and H. N. Ransom, New York.

Financial and Corporate

Stock and Money Markets

May, 26, 1914.

The trading on the New York Stock Exchange to-day was the smallest of the year. The tone, however, was steady. On advices from Washington of possible criminal action in connection with the New Haven, that issue declined more than a point. Reading also shaded off slightly and Westinghouse Electric lost ½, selling down to 77⅜. Rates in the money market to-day were: Call, 2 per cent.; sixty days, 2¼@2½ per cent.; four months, 2¾@3 per cent.; six months, 3@3½ per cent.

The tone of the trading in Philadelphia to-day was steady. Odd lots of Philadelphia Rapid Transit sold at 17.

The Boston market to-day was extremely dull and narrow. Small sales were recorded of Boston Elevated, West End Street Railway and Massachusetts Electric preferred.

In the trading on the Chicago Stock Exchange to-day price changes were irregular. Bonds were firm.

Trading was fairly active in the stock market in Baltimore to-day. The sales of stock totaled 2697 shares, the great bulk of which were United Railways issues. The bond transactions totaled $47,000, par value.

Quotations of traction and manufacturing securities as compared with last week follows:

	May 20	May 26
American Brake Shoe & Foundry (com.)	87	87
American Brake Shoe & Foundry (pref.)	134	135
American Cities Company (com.)	*29	*29
American Cities Company (pref.)	64	65
American Light & Traction Company (com.)	340	337
American Light & Traction Company (pref.)	107	107½
American Railways Company	37	37
Aurora, Elgin & Chicago Railroad (com.)	32½	32½
Aurora, Elgin & Chicago Railroad (pref.)	77	77
Boston Elevated Railway	80½	82
Boston Suburban Electric Companies (com.)	7	7
Boston Suburban Electric Companies (pref.)	a55	a55
Boston & Worcester Electric Companies (com.)	*6¼	*6¼
Boston & Worcester Electric Companies (pref.)	36	36
Brooklyn Rapid Transit Company	93	93
Capital Traction Company, Washington	98⅝	100
Chicago City Railway	135	135
Chicago Elevated Railways (com.)	20	20
Chicago Elevated Railways (pref.)	65	65
Chicago Railways, ptcptg., ctf. 1	a98	95
Chicago Railways, ptcptg., ctf. 2	34	34¾
Chicago Railways, ptcptg., ctf. 3	5	5
Chicago Railways, ptcptg., ctf. 4	2	2
Cincinnati Street Railway	*102½	102
Cleveland Railway	104¼	104¼
Cleveland, Southwestern & Columbus Ry. (com.)	*4	*4
Cleveland, Southwestern & Columbus Ry. (pref.)	*30	*30
Columbus Railway & Light Company	*13	13
Columbus Railway (com.)	*53	53
Columbus Railway (pref.)	*79½	79½
Denver & Northwestern Railway	*63	*63
Detroit United Railway	a80	a80
General Electric Company	148	149
Georgia Railway & Electric Company (com.)	119	120
Georgia Railway & Electric Company (pref.)	86½	86½
Interborough-Metropolitan Company (com.)	14½	14⅜
Interborough-Metropolitan Company (pref.)	62¼	62
International Traction Company (com.)	*40	*40
International Traction Company (pref.)	*85	*85
Kansas City Railway & Light Company (com.)	18	18
Kansas City Railway & Light Company (pref.)	37	37
Lake Shore Electric Railway (com.)	6	*6
Lake Shore Electric Railway (1st pref.)	92	*92
Lake Shore Electric Railway (2d pref.)	22	22
Manhattan Railway	130½	130½
Massachusetts Electric Companies (com.)	11	10
Massachusetts Electric Companies (pref.)	60½	60
Milwaukee Electric Ry. & Light Co. (pref.)	95	95
Norfolk Railway & Light Company	25½	25½
North American Company	76⅞	76½
Northern Ohio Traction & Light Co. (com.)	70	a70
Northern Ohio Traction & Light Co. (pref.)	101	a101
Philadelphia Company, Pittsburgh (com.)	40	39⅜
Philadelphia Company, Pittsburgh (pref.)	38½	38½
Philadelphia Rapid Transit Company	*17	17
Portland Railway, Light & Power Company	50	50
Public Service Corporation	112	112
Third Avenue Railway, New York	42½	42½
Toledo Traction, Light & Power Co. (com.)	20	a20
Toledo Traction, Light & Power Co. (pref.)	70	a70
Twin City Rapid Transit Co., Minn. (com.)	107	106
Union Traction Company of Indiana (com.)	*11½	*11½
Union Traction Company of Indiana (1st pref.)	*75	*75
Union Traction Company of Indiana (2d pref.)	*14	*14
United Rys. & Electric Company (Baltimore)	28	28½
United Rys. Inv. Company (com.)	15	15½
United Rys. Inv. Company (pref.)	42½	42
Virginia Railway & Power Company (com.)	49	49
Virginia Railway & Power Company (pref.)	98¼	98
Washington Ry. & Electric Company (com.)	87¼	87½
Washington Ry. & Electric Company (pref.)	84	83½
West End Street Railway, Boston (com.)	67¼	66½
West End Street Railway, Boston (pref.)	87	88
Westinghouse Elec. & Mfg. Company	76	77¾
Westinghouse Elec. & Mfg. Co. (1st pref.)	122	123

*Last sale. a Asked.

ANNUAL REPORT

Mobile Light & Railroad Company

The income statement of the Mobile Light & Railroad Company, Mobile, Ala., for the year ended Dec. 31, 1913, follows:

Revenue from transportation:	
Passenger	$610,704
Special car	1,662
Mail	260
Freight	1,767
Total	$614,393
Revenue from other operations:	
Station and car privileges	$1,764
Rent of buildings and other properties	1,400
Miscellaneous	45
Total	$3,209
Total operating revenue	$617,602
Total operating expenses	338,859
Net operating revenue	$278,743
Less taxes	33,416
Operating income	$245,327
Other income:	
Income from securities owned	$5,868
Miscellaneous	210
Total	$6,078
Gross corporate income	$251,405
Deductions from income:	
Interest on funded debt	$99,470
Interest on floating debt	458
Interest on unpaid paving assessments	4,568
Total	$104,496
Net corporate income	$146,909

The gross earnings from transportation for the year 1913 failed to show the increase expected; the increase was $9,832, or 1.63 per cent above the preceding year. Up to Sept. 1, the gross earnings showed an increase of $12,100, or 3.03 per cent; but the last four months of the year showed a decrease of $2,268, or 1.11 per cent.

The policy of the company for several years past has been continued, namely, to give the best service, pay good wages and protect the bondholders by putting a large amount of the earnings into improvements. During the year the company paid one dividend of 2 per cent on its capital stock. This brought the total dividend paid since the organization of the company in 1901 up to 8 per cent for the twelve and one-half years. While the cash dividends have been small, the value of the property has increased by the policy of paying for improvements out of earnings. The company is largely locally owned by resident stockholders and the bonds of the company are nearly all held in Mobile. During the year the company purchased eight single-truck and four double-truck steel cars, paid for out of the depreciation fund. The new cars have doors enclosing the platform, the doors on the rear platform being operated by the conductor and those on the front platform by the motorman. White passengers enter the cars by the rear doors, deposit their fare in registering fare boxes on the rear platform, and leave by the front exit door on the front platform. Negro passengers leave by the rear exit door.

The question of increase in taxes continues to be a serious one. The company paid in taxes and licenses for the year the sum of $33,188, and in addition paid $22,981 for paving taxes. Franchise taxes, licenses, corporation taxes and paving taxes amounted to $56,170, which divided by forty-one, the average number of cars operated, gives $1,367, which is the franchise and privilege tax paid on each car for the year.

The comparison of passenger car service statistics for 1912 and 1913 contained in the report is as follows:

	1912	1913
Revenue passengers	12,174,116	12,382,898
Transfer passengers	2,297,214	2,394,884
Free passengers	31,794	30,443
Employees	248,056	268,970
Percentage of revenue passengers transferred	18.9	19.3
Average fare per revenue passenger	.0495	.0494
Average fare per revenue and transferred passenger	.0416	.0414
Average fare all passengers	.0408	.0406
Car miles operated	2,543,312	2,456,537
Car hours operated	275,636	271,487
Passenger earnings per car mile	$.2368	$.2493
Passenger earnings per car hour	2.18	2.26
Passenger earnings per car trip	.65	.67

Chicago Elevated Railways Financing

Samuel W. Insull, president of the Commonwealth Edison Company, Chicago, Ill., refused on May 25 to indicate the plans for financing the elevated railways in connection with the notes soon to fall due. In this connection he said:

"This is a big undertaking, and it would be impossible for me to give out any information in advance of the actual consummation of all the plans. I should say that within the course of a few days an official statement would be made, but this should not be taken as a certainty."

Following the meeting of the directors of the Chicago Elevated Railways, Henry A. Blair, one of the trustees, said that nothing new had developed at the meeting in regard to the plan for refunding the $30,000,000 notes due on July 1, and the plan to have members of the common stock syndicate accept ten-year 6 per cent debenture bonds, in lieu of cash, for their common stock holdings.

According to the Chicago *Economist* the Commonwealth Edison Company has not performed any act recently by which it has acquired control of the Chicago Elevated Railways, but it is coming into control by virtue of an agreement dated June 1, 1911. Under this agreement it covenanted that if the amalgamation of the elevated roads and the Chicago City Railway and the Chicago Railways "shall not be accepted within said three years, it shall pay or cause to be paid to the stock syndicate the sum of $6,000,000, less a sum equal to $30 per share of the common shares taken by and distributed to the depositors, provided that the Edison Company shall have the right and privilege during a period of thirty days after the making of such an agreement to purchase from the stock syndicate all the preferred shares of the new company (other than those distributed to the depositors) at a price equal to $125 per share plus any unpaid and accrued dividends thereon, from which purchase price shall be deducted the total sum so paid by the Edison Company to the stock syndicate."

The stock syndicate referred to is the organization formed by the National City Bank, New York, to purchase the elevated roads of Chicago and consolidate them in the Chicago Elevated Railways.

The *Economist* says that it is not intended that the Commonwealth Edison Company shall remain in control. The only purpose the Commonwealth Edison Company has is that of selling power to these transportation interests. To 1927, when the franchises of the surface roads expire, and to 1937 in the case of the elevated roads, it is estimated that these properties will require electrical energy costing not less than $125,000,000. The Edison has short term contracts with these companies but evidently intends to secure contracts for long terms. Samuel Insull, being questioned on this subject, stated unequivocally the purpose of his company to "dominate the power interests of Chicago, to effect the greatest economy in production and the lowest possible price to everybody with the best results to the investor."

In an endeavor to bring about a consolidation or operating merger of the surface and the elevated railway interests the local transportation committee of the City Council of Chicago called a meeting on May 26. Speaking before this body Henry A. Blair, representing the surface lines, stated that he thought an operating merger was desirable. There were certain limits, however, to which the contemplated 5-cent fare will not reach, but the surface lines were willing to cooperate to the fullest extent toward securing unification. Samuel Insull, representing the elevated interests, indicated that any scheme leading to unification would receive the support of the owners of the elevated railroads. He thought that an operating merger would probably bring the quickest results. He stated further that the company would be willing to accept any other plan which could be shown to be easier of accomplishment. In regard to the 5-cent fare Mr. Insull said the negotiations would probably have to be based upon valuation of the property as indicated by actual cash invested. Alderman Henry D. Capitain moved that the negotiations be referred to a committee on service betterment with instructions to report to the committee on local transportation.

Argenta (Ark.) Railway.—The Argenta Railway has been taken over by C. C. Kavanaugh and his associates. New officers have been elected for the company as follows: C. C. Kavanaugh, president; E. W. Jackson, vice-president, and W. A. Cantrell, secretary-treasurer. C. C. Kavanaugh is a director of the Little Rock Railway & Electric Company.

Birmingham Railway, Light & Power Company, Birmingham, Ala.—Bertron, Griscom & Company, New York, N. Y., are offering for subscription 6 per cent debenture gold notes of the Birmingham Railway, Light & Power Company dated July 1, 1913, due July 1, 1915, but callable at 101 and interest on any interest date. The total authorized issue is $2,500,000. The par value of the notes is $1,000 and the interest is payable in January and June in New York.

Butte, Anaconda & Pacific Railway, Anaconda, Mont.—The report of the Amalgamated Copper Company for the year ended Dec. 31, 1913, says in regard to the Butte, Anaconda & Pacific Railway: "The electrification of the Butte, Anaconda & Pacific Railway from the mines at Butte to the reduction works at Anaconda was completed during the year, and the officials in charge of the road have reported that the resulting economies are exceeding expectations, and that the operations in general are much more satisfactory than when the road was operated by steam. The railway transported during the year 5,842,944 tons of ore and freight, and 304,138 passengers. The gross earnings were $1,422,317 and rental of tracks and miscellaneous receipts $20,092; operating expenses, $1,107,412; taxes, interest and rental of leased lines $102,576; net income $232,421, which was carried to surplus for the year."

Dedham & Franklin Street Railway, Westwood, Mass.—The Massachusetts Public Service Commission has approved $35,000 as amount of stock of the proposed new corporation which is to take over the Dedham & Franklin Street Railway, recently acquired at receiver's sale.

Fort Wayne & Springfield Railway, Decatur, Ind.—The property of the Fort Wayne & Springfield Railway, which has been in the hands of French Quinn as receiver since September, 1912, was offered for sale at Decatur on May 15, but no bids were received. The upset price as fixed by the court was $200,000.

Hagerstown & Frederick Railway, Frederick, Md.—The Hagerstown & Frederick Railway has filed amendments to its charter increasing the authorized capital stock of the company from $3,000,000 to $4,200,000. The $4,200,000 of authorized stock consists of $2,000,000 of common stock and $2,200,000 of preferred. Of the common $2,000,000 is outstanding and of the preferred $635,000. The Fidelity Trust Company, Baltimore, Md., as syndicate managers, is receiving subscriptions for $800,000 of thirty-year first and refunding mortgage 6 per cent bonds, redeemable at 105 and interest. These bonds are part of an issue of $10,000,000. The bonds are being sold at 98½ and interest. The common stock of the company has been placed in a voting trust, of which Van Lear Black and Frank A. Furst, Baltimore, and Emory L. Coblentz, Frederick, vice-president of the company, are the voting trustees. Sanderson & Porter, New York, N. Y., will be in control and personally operate the properties.

Springfield (Ohio) Railway.—E. H. Rollins & Sons, Boston, Mass., are placing $1,244,000 of first mortgage 5 per cent serial gold bonds of the Springfield Railway at prices to yield 5 per cent to 5.40 per cent. The bonds are dated May 1, 1914. From Sept. 1, 1914, to 1923, inclusive, $12,500 of the bonds are due per annum; from Sept. 1, 1924, to 1934, inclusive, $25,000 of the bonds are due per annum, and on Sept. 1, 1935, $844,000 of the bonds are due. The principal and interest are payable at the office of the Real Estate Title, Insurance & Trust Company, Philadelphia, Pa., trustee. The bonds due between 1914 and 1923 are in the denominations of $500 and $1,000; those due between 1924 and 1934 are in the denomination of $1,000, and those due in 1935 are in the denominations of $100, $500 and $1,000.

United Railways & Electric Company, Baltimore, Md.—A special meeting of stockholders of the United Railways & Electric Company will be held on June 1 to consider the sale of $1,000,000 of two-year collateral trust 5 per cent coupon notes, convertible into common stock at $33.33 per share. Stockholders of record at noon June 1 will be given preference in allotment of $100 of notes or multiples thereof for every forty shares of stock or multiples thereof.

Virginia Railway & Power Company, Richmond, Va.—The directors of the Virginia Railway & Power Company have declared a regular semi-annual dividend of 3 per cent on the preferred stock, payable on July 10 to holders of record of June 13. This places the stock on a 6 per cent annual basis, an increase of 1 per cent.

Wilkes-Barre & Hazleton Railroad, Hazleton, Pa.—A committee consisting of W. Frederick Snyder, George P. Bissel and Henry M. Watts has been formed for the purpose of finding out why the net earnings of the Lehigh Traction Company are insufficient to pay interest on the company's bond issue. Recently the president of the company asked holders of mortgage bonds to surrender their coupons falling due on June 1, 1914, and on the five succeeding interest periods, and to accept in lieu thereof the company's non-interest bearing scrip. The committee mentioned advises bondholders to deposit their bonds with the Northern Trust Company, taking in exchange the trust company's receipt containing the following provisions: First, that each depositor may withdraw his bonds at any time; second, that no depositor shall incur any expense whatever by reason of the deposit; third, that the committee will, after investigation, report to each depositor what course is most likely to prove protective of the interests of bondholders.

Dividends Declared

Chicago (Ill.) Elevated Railways, quarterly, $1.50, preferred participating certificates.

Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., quarterly, 1¾ per cent, preferred.

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

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

Tennessee Railway, Light & Power Company, Memphis, Tenn., quarterly, 1½ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO.					
1m., Mar., '14	$97,317	$63,364	$33,953	$32,462	$1,491
1 " " '13	87,172	61,470	25,702	31,329	†5,627
3 " " '14	274,298	178,031	95,367	95,946	†579
3 " " '13	259,992	173,476	86,515	92,976	†6,461
DETROIT (MICH.) UNITED RAILWAYS					
1m., Mar., '14	$990,532	$681,874	$308,658	$180,629	$128,029
1 " " '13	1,046,699	683,465	363,233	180,309	182,924
3 " " '14	2,834,631	1,977,718	856,912	541,522	315,390
3 " " '13	2,972,211	1,984,760	987,450	537,413	450,037
FORT WAYNE & NORTHERN INDIANA TRACTION COMPANY, FORT WAYNE, IND.					
1m., Mar., '14	$148,238	$88,219	$60,019	$52,009	$8,010
1 " " '13	136,970	80,276	56,694	48,734	7,960
3 " " '14	457,412	259,022	198,390	151,804	46,586
3 " " '13	428,542	232,234	196,308	142,718	53,590
KENTUCKY TRACTION & TERMINAL COMPANY, LEXINGTON, KY.					
1m., Mar., '14	$62,815	$33,193	$29,622	$20,731	$8,891
1 " " '13	61,309	30,540	30,769	19,396	11,373
9 " " '14	599,721	303,249	296,472	184,143	112,329
9 " " '13	574,417	305,762	268,655	167,739	100,916
NEW ORLEANS RAILWAY & LIGHT COMPANY, NEW ORLEANS, LA.					
1m., Mar., '14	$609,943	$317,294	$292,649	$205,851	$86,798
1 " " '13	583,008	298,852	284,156	191,333	92,823
3 " " '14	1,844,654	940,115	904,539	616,342	288,197
3 " " '13	1,777,637	897,354	880,283	573,055	307,228
NEW YORK RAILWAYS, NEW YORK, N. Y.					
1m., Feb., '14	$982,546	$647,350	$335,196	$370,586	†$35,390
1 " " '13	1,074,890	675,622	399,268	373,882	25,386
8 " " '14	9,549,885	5,836,059	3,713,826	2,971,126	742,700
8 " " '13	9,562,410	5,775,455	3,786,955	3,011,245	775,710
REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y.					
1m., Apr., '14	$253,728	*$142,756	$110,973	$47,071	$63,902
1 " " '13	229,717	*145,239	84,478	45,883	38,595
12 " " '14	3,066,882	*1,850,794	1,216,088	531,014	685,074
12 " " '13	2,779,613	*1,682,090	1,097,523	535,375	562,148
TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.					
1m., Mar., '14	$751,175	$412,021	$339,153	$232,636	$106,517
1 " " '13	710,623	365,363	345,261	239,349	105,912
3 " " '14	2,177,027	1,216,999	960,027	675,385	284,642
3 " " '13	2,036,455	1,095,378	941,077	698,438	242,639
VIRGINIA RAILWAY & POWER COMPANY, RICHMOND, VA.					
1m., Mar., '14	$420,995	$205,120	$215,875	$134,542	$81,333
1 " " '13	403,953	199,425	204,528	126,526	78,002
9 " " '14	3,928,027	1,930,977	1,997,051	1,208,990	788,061
9 " " '13	3,693,661	1,815,241	1,879,740	1,117,232	762,508

*Includes. †Taxes.

Traffic and Transportation

Commission Decision Affecting Indianapolis Terminal

The Public Service Commission of Indiana on May 22 issued an order in which the various interurban lines centering in the freight yards of the Traction Terminal Station at Indianapolis were authorized to close the doors of their freight houses at 5 o'clock each evening if they so desired. The order also sets out that the freight handling facilities in the terminal at Indianapolis have been rendered inadequate by the growth of the business, and suggests that the only remedy lies in the enlargement of the present houses and yards, which cannot be accomplished in the present location of the freight houses.

The case is one in which the wholesale grocers of Indianapolis petitioned the commission to issue an order compelling the interurban railways to keep the doors to their freight houses open until 6 p. m. This was formerly done, but the interurban lines centering at the Terminal Station in Indianapolis found that shippers were delaying sending their shipments to interurban lines until after the steam road freight houses closed at 4.30 p. m., using their trucks and drays to haul shipments to the steam roads first and leaving the interurban shipments until the latter part of the afternoon, thus causing great congestion of traffic.

All the interurban roads coming into Indianapolis enter over the tracks of the Indianapolis Traction & Terminal Company and all freight cars discharge and receive freight at four freight station buildings located on the west half of the block bounded by Illinois, Market and Ohio Streets and Capital Avenue. These freight houses are about 200 ft. long and 20 ft. wide. Two of the houses have tracks on both sides and two have tracks on one side only. The tracks by the side of and between the freight houses hold twenty-two cars. When cars are standing on these tracks only the two houses with tracks on one side are available for platform delivery, and shipments to the other houses are loaded directly onto the freight cars.

Most of the freight handled during the forenoon is delivered at the freight-house platforms for loading onto the cars on their arrival. However, only a small per cent of the freight shipped is delivered before noon, the greater part of the shipments being from wholesale houses in filling orders received in the morning mail. Freight cars over the various lines begin to arrive at Indianapolis about 11 a. m., and by 2 p. m. the tracks at the freight stations are filled with cars.

The only remedy suggested in the complaint was to move some of the tracks in the freight yards so as to leave one side of each freight house clear of cars at all times and have platform delivery at all hours of the day. Investigation showed that the cost of this change would be $25,000, and that it would provide no enlargement of the freight houses, no increase in the width of driveways, nor any betterment of facilities for handling trucks and drays. On the other hand, it would decrease the trackage for cars. Passing all freight through the freight houses would perhaps enable trucks and drays in many instances to unload all their freight at a single door and thus save time and inconvenience in moving from one car or unloading place to another, as is the case now when the truck has shipments for more than one line, but on account of the present narrow freight houses it would be impossible to receive the freight from trucks and drays and place it as rapidly as it is now received.

The commission stated that it was quite apparent that the only remedy for the difficulties under consideration would be in enlarged freight houses and yards, which could not be had at the present location. The commission suggested that the freight terminals of all or nearly all of the interurban roads should be moved from their present location to some place where each road could have its freight house of ample size for a complete platform delivery and its own yard, the limits of which would be entirely apart from the yard limits of any other interurban road. The present location could not, in the opinion of the commission, by any change be made to approach adequate facilities for handling the interurban shipping of Indianapolis, even at its present volume, to say nothing of taking

care of the growth of shipping in the future. The commission said that the question of relocating and enlarging the depots and the station facilities is not open for its consideration at this time in the case under hearing.

Brief in Washington Fare Case

The brief of the respondent filed with the Interstate Commerce Commission in the Washington, D. C., suburban fare case points out that the only question to be determined by the commission in the so-called Somerset rate case is whether or not the Washington & Rockville Railway and the Georgetown & Tenleytown Railway have proved that the proposed increase to and from Somerset, Md., was just and reasonable, and that an examination of the testimony of William F. Ham, vice-president of the company, "will show conclusively that the proposed increased rate to Somerset, Md., is not only just and reasonable, but is lower than other rates upon electric lines giving a similar character of service." The case grew out of the filing of tariffs by the respondents proposing to collect an additional 5-cent car fare between the District line and Somerset, Md., whereas residents of that section now pay either 5 cents or a car ticket for the ride either way. The brief compares rates on the line to Somerset with the rates collected on the lines to other suburbs similarly situated, as, for instance, Silver Spring, which is 0.4 mile across the District line, while Somerset is 0.5. It costs Silver Spring residents 5 cents additional to get to their homes. The necessity for the establishment of the system of fare zones within whose limits a passenger may travel at a flat rate or unit of fare is too well settled to require comment. Several opinions of the commission on rates to suburbs of the District are cited as grounds for higher Somerset rates. The proposed increases are lower than any of the rates for substantially the same distance from Washington, D. C., to the following points: Gregory, Md.; Vanderwerken, Va.; Brook, Md.; Torrison, Va.; Alexandria, Va.; Veitch, Va.; Riverdale, Md., and Silver Spring, Md.

Schenectady Fare Case Decided in Favor of Company

The Public Service Commission of the Second District of New York has dismissed the case brought by the city of Schenectady against the Schenectady Railway to require the company to resume the sale of six tickets for 25 cents. Two opinions were filed, one by Commissioner Emmet and another by Commissioner Decker. All of the commissioners concurred in the decision. Commissioner Emmet's opinion, after stating that the only real question in the case is whether the 5-cent rate of fare now in force does or does not produce an unreasonable income upon the capital invested in the company's urban business, goes on to say:

"If it should appear that the return upon the capital invested is not under present conditions an unreasonable one, all things considered, then the question whether these profits might not be cut down somewhat without actually wrecking the company need not, we think, be gone into very deeply. As we understand it, the law contemplates that public service corporations shall enjoy a larger latitude in the matter of fixing their rates than they would have if they were held down to rate schedules so calculated as to enable these corporations just to avoid insolvency. To apply this last-named test to the rates of fare charged by street railway corporations in New York State would be to drive private enterprise out of this portion of the public service field at a very early date. Again, if we should determine that the company's present rates of fare produce no more than a reasonable return upon the capital invested within the 5-cent fare zone, we need not pass upon the question whether lower fares might not so stimulate the business of the company as in the end actually to swell its revenues rather than to reduce them. As to what will be the result of lower fares in any given instance depends upon many uncertain factors, and must be viewed rather as a fertile field for speculation than as a problem susceptible of exact demonstration."

Discussing the figures produced at the hearings in the case, showing the value of the company's property, the number of passengers carried and the amount of the company's present income, Commissioner Emmet concludes that even if the city's views as to the value of the company's property were all correct, its present net income would only represent a yield of between 8 and 9 per cent on such valuation, which percentage would be reduced further if any considerable portion of the cost of complying from time to time with the provisions of the public service law and with orders of the commission were to be met out of current earnings instead of out of capital. He expresses the opinion that some at least of such expenses should be paid out of annual income, and that even a slight charging off against income of such betterments and replacements as must be made every year under the present system of vigilant supervision over public service corporations would bring the net income of the Schenectady Railway to an amount which, under existing conditions, could not justifiably be characterized as an excessive income yield. The opinion of Commissioner Emmet goes on to say in this connection:

"Our present public service law was intended not merely to permit corporations of this character to accumulate such scant earnings as would keep them out of the bankruptcy courts, but actually to allow them under good management to attain positions of reasonably assured prosperity. The fact, therefore, that the Schenectady Railway seems to have attained that kind of a position does not alter our opinion that such a decision as is asked for by the complainants here would be regarded throughout the State of New York, and perhaps over a larger area, as the equivalent of a warning to private enterprise and capital that these are not particularly wanted any longer in the street railway field. We do not think it well to issue such a warning, or what might with some degree of justice be construed as such, at the present time. The result of driving private capital from the work of extending and improving the transit facilities our people now enjoy would, in our opinion, be quite as deplorable from the standpoint of the general public as from that of the financially courageous individuals whose money is now invested in good faith in public service enterprises throughout the United States."

The opinion of Commissioner Emmet closes as follows:

"The truth is, it is not a particularly happy time, in our judgment, for government to intervene with a heavy hand in cases like this, where the rate that is complained of is, after all, merely the well-known and widely prevalent charge of 5 cents for each passenger. If industrial conditions in Schenectady and elsewhere were different we might be willing to apply in this particular case a somewhat more rigorous test as to the justice of the rates involved than we are now applying. But the conditions to which we refer seem to justify us in construing an admittedly doubtful point with some degree of librality toward the respondents in this case—leaving the way open at some future time, after a change in conditions has occurred, to consider the fundamental question involved in this controversy afresh, if by that time voluntary action has not been taken by the railway company to adjust its differences with the citizens of Schenectady on some basis that will be satisfactory to both parties."

Commissioner Decker's opinion states in substance as follows:

"The fact that the six tickets for a quarter were formerly in general use by the respondent, with no showing that their continuance in sale would have severely crippled the company's net revenues, is persuasive to an extent and tends to throw a burden of justification upon the respondent. The company contended that a reasonable average return upon the value of its property used in this service and the necessity of making reservation out of income for surplus and contingencies which the commission must consider in connection with the proposed restoration constitute upon the facts shown a bar to the relief demanded by the complainant."

The opinion finds that for the year ended June 30, 1913, the company earned over operating expenses and taxes $260,084 upon so-called city traffic. The company claims a total cost for the property as used in the so-called city traffic of $4,562,932, while the city claimed a total cost of $3,157,809. Using the city figures, a 6 per cent rate gives a money return of $189,468, which deducted from the year's revenue over operating expenses and taxes leaves $70,616.

It appears from the testimony that the six tickets for a quarter rate would reduce the revenue by $100,227. That would produce a deficiency on the year's business (after allowing for the return on investment) of the difference between that amount and $70,616, which is $29,610. This, the opinion states, takes no account of any increase in business due to natural increase or to the lower rate, but against that must be applied the fact that there has been no allowance made for depreciation of the property or for contingencies or for surplus. Upon these facts it is declared in the opinion that if on the investment cost claimed by the city itself a 6 per cent return is applied the balance of revenue remaining is insufficient upon any theory to justify the reduction in rate demanded in the complaint against the company.

It is further stated in the opinion that the commission knows from a separate investigation that the company must make additions to its property both in cars and trackage and that there must be improvement in service which adds to the expenses. The opinion concludes that while theoretically it may be said that with the six for a quarter tickets on sale it would have been wise on many grounds for the company to continue such sale, and it is even doubtful whether spread over future years their adoption would now constitute serious loss to the company, the commission is bound in its determination to be guided by the controlling record facts and the tests and considerations fixed by the laws of the State.

I. C. C. Accident Bulletin

Accident Bulletin No. 49 of the Interstate Commerce Commission for the three months ended September, 1913, contained the following statement of collisions and derailments on electric railways for the period covered:

No.	Classes	Number	Number of Persons Killed	Number of Persons Injured	Damage to Road and Equipment and Cost of Clearing Wrecks
	Collisions:				
1	Rear	19	14	429	$13,343
2	Butting	8	..	68	6,318
3	Trains separating	..	..	...	.....
4	Miscellaneous	14	1	72	2,724
	Total	41	15	569	$22,385
	Derailments due to—				
5	Defects of roadway	10	..	25	$1,075
6	Defects of equipment	2	..	1	211
7	Negligence of trainmen, signalmen, etc.	4	..	5	150
8	Unforeseen obstruction of track, etc.	8	..	29	3,250
9.	Malicious obstruction of track, etc.	1	..	4	45
10	Miscellaneous causes	6	1	71	5,278
	Total	31	1	135	$10,009
	Total collisions and derailments	72	16	764	$32,394
	Total for same quarter of—				
	1912	77	8	335	$54,009
	1911	62	3	459	21,905
	1910	78	46	458	36,355

Near-Side Stop in Little Rock.—The amended traffic ordinance, recently passed by the City Council of Little Rock, Ark., requiring cars of the Little Rock Railway & Electric Company to stop at near crossings, was put into effect on May 1.

Hearing in Ouster Case.—The hearing of the case of Stark County against the Northern Ohio Traction & Light Company, Akron, Ohio, to oust it from the Canton-Massillon highway, was begun before Master Commissioner McCarty recently at Canton.

Complain of Reduced Service.—Residents of Cincinnati, Ohio, have complained to the Public Utilities Commission about the reduction of service proposed by the Interurban Railway & Terminal Company. The commission has taken the matter up with the company.

Rate Schedules in Pennsylvania.—The Public Service Commission of Pennsylvania has issued an order requiring the companies under its jurisdiction to file with the commission not later than June 1, 1914, all tariffs which were in effect on Jan. 1, 1914, together with all supplements or amendments, etc.

Free Rides for Children.—Children under fourteen years of age were transported free over the lines of the Springfield (Ill.) Consolidated Railway to the Gaiety Theater recently, the only requirement being that they exhibit their "fly campaign" tickets. A delegation of mothers met all of the cars and saw that order was maintained at the theater.

Interurban Railroads Will Aid in Advertising Home Products Show.—The Ohio Electric Railway, the Scioto Valley Traction Company and the Columbus, Delaware & Marion Railway have all agreed to aid in advertising the home products show to be held in Columbus, Ohio, in June. They will put posters into their stations and distribute advertising matter from the car boxes, it is said. The Central Passenger Association has also agreed to place posters in the railroad stations.

Service Increased at Niagara Falls.—The meeting of the A-B-C mediators in Niagara Falls, Ont., has prompted the International Railway and the Suspension Bridge Electric Railway to increase the number of cars operated between Buffalo and Niagara Falls and the service over the Suspension Bridge spanning the gorge. Many of the mediators and delegates from South American countries are living on the American side while some of the newspapermen representing press associations throughout the civilized world are at Buffalo hotels.

Kentucky Rate Legislation.—Passenger rate legislation by the last Legislature fixing the maximum rate per mile at 2½ cents affects common carriers with lines more than 50 miles in length. The electric railways in the State are shorter, as a rule, though in any event the new rate would not affect the prevailing electric line rates. The "Beargrass" lines of the Louisville & Interurban Railway, several in number and averaging, it happens, about 12½ miles to the line, collect a fare which is approximately 1¼ cents a mile for the maximum distance. In other words, the rate from the central station to the end of the line on virtually all of these lines is 15 cents straight.

Complaint Against Schenectady Railway.—B. B. Johnson, Schenectady, appeared before the Public Service Commission of the Second District, New York, recently, in behalf of residents of Aqueduct who complained against the Schenectady Railway as to service rendered the public. Lewis E. Carr and Hubbell Robinson, of Naylon & Robinson, Schenectady, appeared for the railway company. There was a delegation of business men from Aqueduct who testified as to the car service, condition of cars operated, and the condition of the waiting room at Aqueduct. An adjournment was taken until June 4, at Albany. In the meantime the complainants will take the matter up with the representatives of the company to see whether or not the conditions complained of cannot be rectified without a formal order of the commission.

New Brooklyn Transfer Provisions.—Instructions have been issued to conductors by the Brooklyn (N. Y.) Rapid Transit Company in regard to the new transfer system in Brooklyn, which becomes effective on June 1, by order of the Public Service Commission. Under the new system there will be 1008 transfer points in Brooklyn, as against 721 at present, an increase of 287 transfer points. On no single line will more than six different kinds of transfer tickets be in use, and on many of the lines only three or four different kinds of tickets will be required according to the plan. The Fulton Street line, which is a line having the maximum number of tickets, the passenger may receive either a buff ticket on payment of his cash fare eastbound, or a green ticket on payment of his cash fare westbound. These tickets are good in all instances for transfers to intersecting feeder lines. On the back are listed the intersecting lines at which there may be either an extension of the general privilege of a single transfer, or a limitation of such privilege in accordance with the plan devised by the commission to prevent looping. The conditions with respect to these cash fare transfers is substantially the same throughout the system. Otherwise than as specified on the back, the transfer is good for a single ride on any intersecting line, but not good for a re-transfer.

Personal Mention

Mr. H. U. Mudge, president of the Chicago, Rock Island & Pacific Railway, has been elected president of the American Railway Association for the ensuing year.

Mr. J. L. Richards, president of the Middlesex & Boston Street Railway, Newtonville, Mass., has withdrawn his name as one of the trustees or liquidators of the Boston & Maine Railroad.

Mr. L. C. Dimmer has been appointed traveling auditor of the Illinois Traction System. For the past five years he has been employed in various clerical capacities in the Champaign office of Mr. B. E. Bramble, general auditor of the company.

Mr. A. H. Ford, who has been president of the Birmingham Railway, Light & Power Company, Birmingham, Ala., for the last seven years, has resigned from the company to become vice-president and general manager of the Cumberland County Power & Light Company, Portland, Maine, succeeding Mr. E. T. Munger, who has retired on account of ill health.

Mr. W. H. Foster has been appointed superintendent of the New York Division of the New York, New Haven & Hartford Railroad, vice C. H. Motsett, resigned. Mr. Foster was born on June 8, 1866. He began railroad work on the Pennsylvania Railroad as an operator in 1882, and entered the service of the New York, New Haven & Hartford Railroad as an operator in March, 1888. Since then he has been successively dispatcher, and chief dispatcher of the New York Division, trainmaster on the Old Colony Division, superintendent of the Old Colony Division and superintendent of the Shore Line Division.

Mr. Edward R. Graham has resigned as assistant to the president of the Bangor Railway & Electric Company, Bangor, Maine, to become associated in the Frank Ridlon Company, Boston, with Mr. Harry B. Ivers, former general manager of the Cumberland County Power & Light Company. Mr. Graham's resignation takes effect on July 1. From 1907 to 1911 Mr. Graham was in the employ of the Bay State Street Railway, Boston. Then for a year he was president and general manager of the Brunswick & Yarmouth Street Railway, and on July 1, 1912, he became assistant to the president of the Cumberland County Power & Light Company. On Feb. 19, 1913, Mr. Graham was appointed as assistant to the president of the Bangor Railway & Electric Company.

Mr. Daniel G. Fisher, president-elect of the Southwestern Electrical & Gas Association, is assistant general manager of the Texas Traction Company and the Southern Traction Company, with headquarters at Dallas, Tex. Mr. Fisher's first railway experience was with the Santa Fé Railroad as assistant trainmaster and chief clerk to the division superintendent at Cleburne, Tex. Later he held a similar position with the Houston & Texas Central Railroad at Ennis, Tex. In 1908 he joined the staff of the J. F. Strickland Company, Dallas, Tex., and in 1912 was appointed assistant to Mr. R. B. Stichter, the general manager. In January of this year Mr. Fisher was made assistant general manager, as above noted, of the Strickland traction system, which comprises interurban electric railways operating from Dallas to Waco, Corsicana and Denison, Tex. The president-elect has long been active in the affairs of the Southwestern Electrical & Gas Association and was for several years its secretary. In recognition of his services in this capacity he was in 1911 elected a vice-president, and last year was advanced to the position of first vice-president. President-elect Fisher is a member of both the Dallas Advertising Club and the Dallas Rotary Club, also serving the former as editor of its publication *Ok'd Copy*.

D. G. Fisher

Mr. E. S. McLean has been appointed superintendent of the Boston & Worcester Street Railway, South Framington, Mass. This is a new position with the company, and Mr. McLean will be in charge of the operation of cars, maintenance of car equipment, track and roadbed. Mr. McLean began his electric railway career as a motorman with the Milford & Uxbridge Street Railway. Upon the opening of the Boston & Worcester Street Railway eleven years ago he entered its employ as a motorman. After serving in that capacity for two or three years he was made foreman of the Westborough carhouse. He was subsequently made foreman of the Framingham carhouse and later was appointed chief inspector. About five years ago he was promoted to the position of master mechanic, which place he has held up to the present time.

OBITUARY

H. J. Wickham, formerly general manager of the Hartford, Manchester & Rockville Tramway, Rockville, Conn., now included in the system of the Connecticut Company, is dead.

Edward Prescott Weeks, assistant treasurer of the Exeter, Hampton & Amesbury Street Railway, Exeter, N. H., is dead. Mr. Weeks was born in Exeter in 1865. At the opening of the Exeter, Hampton & Amesbury Street Railway in 1897 he entered the employ of the company as a motorman, and was promoted through various positions with the company to assistant treasurer.

W. S. Libbey, who was interested in a number of public utility properties in Maine, among them the Portland, Gray & Lewiston Railroad, of which he was at one time treasurer, is dead. Mr. Libbey was born in Avon, Maine, on Aug. 27, 1851. He was educated in the common schools at Oakland and at Coburn Classical Institute. Early in life he learned telegraphy and secured a position in the Western Union office in Lewiston in 1876. He was soon promoted to manager of the Lewiston office of the Western Union Telegraph Company, and remained as such until 1880. Following the successful handling of a small woolen mill at Vassalboro which he acquired while still manager of the Lewiston branch of the Western Union Telegraph Company, and the later purchase of a mill at Dover, Mr. Libbey in 1880 bought the Cumberland mill, and in 1893 the Lincoln mill with all of which properties he has made a great success. In 1901, Mr. Libbey secured control of the American Light & Power Company, and the Lewiston & Auburn Electric Light Company, and consolidated them under the latter name. Five years later, he bought the property of the Mechanic Falls Electric Light Company, and later built a dam across the Androscoggin River at Deer Rips. Mr. Libbey was a director of the Manufacturers National Bank, Portland, Maine, was a trustee of Coburn Classical Institute, and was a member of Governor Cobb's Council.

Public Service Railway Games

On the afternoon of May 27 rain brought to a sudden ending what started as a successful field day of the Public Service Railway employees at Hilton Oval, Hilton, N. J. At 1 o'clock when the games began there were about 2000 people on the field, most of whom were employees and members of their families. The latter travelled from all parts of the system, including Essex, Hudson, Bergen, Passaic, Union, Middlesex and Camden Counties in special cars and several of the delegations were accompanied by brass bands. The representatives from Paterson alone had five cars. At 3 o'clock, when all but the relay race had been run, the storm broke and put an end to the sport, including the baseball game between the Miller-Harrison and the Paterson teams. This game was to have marked the opening of the Public Service Railway Baseball League season. After the games the prizes won in the pocket billiard championship were awarded. The Paterson team won the general trophy and one of its members also captured the gold watch for high run. The Bergen team captured the Essex Division prizes and a member of this team won the Donecker gold watch for high average. All the winners in the athletic contests received gold watches. The second men were rewarded with silver watches.

Construction News

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

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

RECENT INCORPORATIONS

***Rock Falls & Southern Traction Company, Rock Falls., Ill.**—Incorporated in Illinois to build an electric railway, through Rock Falls, Sterling, Deer Grove, New Bedford to Kewanee. Capital stock, $2,500. Incorporators: B. G. Neville, William L. Batteau, William Usburne and George F. Young.

***Grand Falls & Limestone Railway, Grand Falls, N. B.**—The New Brunswick Legislature has incorporated this company to build an electric railway from Grand Falls, on the St. John River, to Limestone, on the boundary between New Brunswick and Maine.

FRANCHISES

Birmingham, Ala.—The Birmingham Rapid Transit Company has asked the Council for a franchise in Birmingham.

Birmingham, Ala.—The Tidewater Power Company has asked the Council for a franchise in Birmingham.

Sausalito, Cal.—The Marin County Electric Railway has received a franchise from the Council in Sausalito to build an electric railway along Water Street from the gate of the military reservation to the northern town limits in Sausalito. The company will secure a county franchise to extend the line from that point. [E. R. J., May 23, '14.]

Wilmington, Del.—The People's Railway has asked the Council for a franchise to extend its Church Street line from Fourth Street along Front and Poplar Streets to Second Street in Wilmington.

La Salle, Ill.—The Chicago, Ottawa & Peoria Traction Company has received a franchise from the Council on Joliet Street, Eleventh Street and St. Vincent's Avenue in La Salle.

***Great Bend, Kan.**—G. Arnutt, Great Bend, has asked the Council for a franchise to build an electric railway in Great Bend.

Louisville, Ky.—The lower board of the General Council has acted favorably upon a measure which would create a franchise for the extension of the tracks of the Louisville Railway for some 2 miles from the present terminus of the West Chestnut Street line at Twenty-seventh Street. The territory which would be served by the line is 2 square miles in area. Lack of adequate service is said to have held back its development. The officers of the Louisville Railway have not expressed themselves on the project. The Aldermen have yet to act on the franchise-creating measure.

Middlesboro, Ky.—In connection with the recent sale of a franchise for the construction of an electric railway in this city, a much more extensive project is being discussed by local capitalists. This includes the construction of a series of electric lines out of Middlesboro, into the surrounding settlements. [E. R. J., May 16, '14.]

Paxton, Ky.—The Kankakee & Urbana Traction Company has received a fifty-year franchise from the Council in Paxton. The company plans to extend its line from Lodlow to Paxton. Work is being completed on the 5-mile extension from Rantoul to Ludlow.

Fort Garry, Man.—The Fort Garry Municipal Railway has received the approval of the Council for an extension of its line in Fort Garry from the present terminus to the end of Pembina Highway, near the village of St. Norbert.

Lewiston, N. Y.—The Village Board of Lewiston has denied the application of the Niagara Gorge Railway to lay additional trackage through that village on the grounds that the company offered no compensation for the further privilege.

***Waterford, N. Y.**—The Erie Southern Railway has received a franchise from the Council in Waterford. This is part of a plan to build an electric line between Waterford and Erie.

Portland, Ore.—After eliminating the monetary value of the franchise intended to be granted to the Portland Railway, Light & Power Company for the use of the Portland bridges for cars at the rate of 3-cents a car, the franchise was formally adopted by the City Council recently and sent up for official advertising. It will be advertised for twenty days, after which a public meeting will be held to hear objections. After this the franchise will come before the Council for final passage. It will take sixty days after being passed finally. The measure wipes out all present contracts between the city and the company for use of the bridges and places the entire proposition on a flat rate of 3 cents a car.

***Schwenksville, Pa.**—The Borough Council has been asked to grant a franchise to build a trackless trolley through Schwenksville. The Council of Collegeville and the supervisors of Perkiomen township have already granted franchises for a trackless trolley line in Collegeville and in Perkiomen. This is part of a plan to build a trackless trolley line through the Perkiomen Valley, via Collegeville, Perkiomen and Schwenksville. No names are yet given of those interested in the project.

***Dallas, Tex.**—The J. Mercer Carter franchise for electric railway lines in the city of Dallas has been sold to E. P. Turner of the Dallas & Southwestern Traction Company and Dallas & Northwestern Traction Company, for $15,000. The deed conveys the J. Mercer Carter franchises in Dallas procured through a city ordinance of July 26, 1906, and also all of their rights and interest in the county franchise granted to John T. Witt and associates for interurban line on the West Dallas pike, west of the city limits, and the Commerce Street bridge over the Trinity River.

***Orange, Tex.**—Augustus M. Hodges, Orange, has asked the Council for a franchise to build an electric railway in Orange.

Terrell, Tex.—The Stone & Webster Engineering Corporation, Boston, Mass., has received a fifty-year franchise from the Council in Terrell. This is part of a plan to build an electric line between Terrell and Dallas, 30 miles.

TRACK AND ROADWAY

Fresno (Cal.) Interurban Railway.—Surveys have been completed and grading is now under way on the 9-mile electric line to connect Fresno and Clovis. J. B. Rogers, Fresno, president.

San Francisco & Northern Railway, San Francisco, Cal.—This company, which has succeeded the Petaluma & Santa Rosa Railway, plans eventually to build a line from Petaluma south to San Francisco Bay. In the near future a direct line between Petaluma and Santa Rosa will be constructed, to replace the long distance route by way of Sebastopol. Another early probability is a line from Santa Rosa to Healdsburg, 13 miles distant. Other extensions are also planned.

San Francisco-San Mateo Right-of-Way Company, San Mateo, Cal.—Preliminary arrangements are being made by this company to build its electric line from San Francisco to Palo Alto. H. C. Tuchsen, Redwood City, president. [E. R. J., May 23, '14.]

Wilmington & West Chester Railway, Wilmington, Del.—This company is being formed to be operated in connection with the Wilmington & Philadelphia Traction Company, to build electric lines in various sections of Wilmington. T. W. Wilson, president of the Wilmington & Philadelphia Traction Company, is reported as confirming previous public announcements concerning plans of the Wilmington & West Chester Railway to give additional railway facilities in the Ninth ward in Wilmington. Ward, Gray & Neary are representing the incorporators of this new company in securing incorporation papers. [E. R. J., May 23, '14.]

Western Illinois Railway, Carthage, Ill.—This company has surveyors in the field surveying the route between Niota and Beardstown. They are now between Powellton and Elvaston. The route out of Niota extends towards Powellton, thence east 1 mile, thence south to Elvaston. From Elvaston two routes will be surveyed. One to Carthage, Bentley, Augusta and Beardstown, and the other from Elvaston to Basco, Denver, Plymouth and Beardstown. Right-of-way men will follow the surveyors and make esti-

mates upon the cost of right-of-way. The estimates on the cost of right-of-way, cost of construction and prospects for future business will determine the route to be selected. Offices will be opened in Carthage in the Foulds' Building. A. M. Milstid will probably have charge of the office. Gasoline-electric cars will probably be used for passenger traffic, while steam engines will probably be used for freight traffic.

Chicago (Ill.) Surface Lines.—This company has received permission from the Park Commissioners to extend its Sixty-ninth Street line from its present terminus at East Marquette road and Stony Island Avenue east to Yates Avenue. The construction of this line will afford the residents of Englewood and Woodlawn through service from Western Avenue to the lake.

Decatur Railway & Light Company, Decatur, Ill.—Plans are being made to begin work at once double tracking North Water Street, extending the Condit Street line to the new locomotive shops and the extension of the Edward Street line to the new hospital in Decatur.

Illinois Traction System, Peoria, Ill.—This company has opened its park for the summer near Homer and known as Homer Park. Plans are being made to build the extension from Georgetown to Bunsenville.

Woodstock & Sycamore Traction Company, Sycamore, Ill.—Complete reorganization of this company and early resumption of operations is promised by T. E. Ryan, St. Charles, representing a large number of bondholders. It is expected to begin operation again early in June and the line will be extended to Woodstock this year and on through McHenry and to Fox Lake in the near future. This railway ceased operating April 1.

Joplin & Pittsburg Railway, Pittsburg, Kan.—This company is asked to consider plans for an extension to Joplin and to Miami, Okla.

Arkansas Valley Interurban Railway, Wichita, Kan.—This company contemplates the extension of its lines from Newton to Canton and McPherson, completing the round trip via Moundridge.

New Orleans Railway & Light Company, New Orleans, La.—This company is asked to consider plans for an extension of its line in New Orleans in the rear of Claiborne Street, up and down through the wards. It is planned to make a belt line, returning to Canal Street through the three wards.

Mexico Investment & Construction Company, Mexico, Mo.—This company has secured the co-operation of the Mexico Commercial Club in a project for an extension from Moline north to Santa Fé and from Mexico south to Champ. The Commercial Club will subscribe for $13,000 in stock, payable when the extensions are in operation.

***Erie, N. Y.**—John S. Rilling, Harrisburg, representing the Erie Construction Company, has asked the Public Utilities Commission for permission to build an electric railway from Erie to Waterford and Corry. Application for a charter will soon be made. The company will probably be known as the Erie Southern Railway.

Schenectady (N. Y.) Railway.—Plans are being made by this company to begin work on the extensions of its lines to South Schenectady, Carman and the Grand Boulevard sections.

Asheville Power & Light Company, Asheville, N. C.—Work has been begun by this company on the South Main or Biltmore Road lines. The company will prepare the lines so that the work of paving the street for 2 miles can be done by the city.

Elizabeth City, N. C.—Right-of-way and franchises are being obtained and financial backing is being secured to build an electric line from the mouth of Little River near the Albemarle Sound, making water connections with Columbia and the lower part of Perquimans County, Weeksville, Nixontown, through Elizabeth City to South Mills and from South Mills by way of Deep Creek to Norfolk, a distance of about 70 miles. Thomas J. Markham, First National Bank Building, Elizabeth City, is interested. [E. R. J., May 16, '14.]

Dayton, Middletown & Cincinnati Railway, Middletown, Ohio.—Surveys are now under way between Middletown and Cincinnati, 29 miles, and construction will be begun as soon as surveys are completed on this 50-mile line to connect Dayton, Germantown, Middletown, Monroe, West Chester, Sharonville, Reading and Cincinnati. James G. Miller, West Chester, president. [E. R. J., April 25, '14.]

Ardmore & Western Interurban Railway, Ardmore, Okla.—Plans are being made by this company to begin work on the first 10 miles of its proposed electric line to connect Ardmore, Springer, Joiner City, Glenn, Wodford, Milo, Oil City, Cornish, Orr and Brock. The first section to be constructed will be between Joiner City and Oil City, Okla. F. B. McElroy, Ardmore, president. [E. R. J., March 14, '14.]

Ardmore (Okla.) Electric Railway.—This company, which has taken over the lines of the Ardmore Traction Company, plans to improve and extend some of the lines in Ardmore. The following officers have been elected: George S. Cravens, president; John F. Easley, secretary, and James C. Mort, treasurer. [E. R. J., April 4, '14.]

Fort William (Ont.) Street Railway.—The extension of this municipally owned electric railway was begun a short while ago. The first work to be undertaken will be the construction of the new belt line along North Syndicate and Pacific Avenues, and Victoria Avenue west to Franklin, and Franklin Street south to Walsh Street. The street railway extension to the Island across the bascule lift bridge is practically completed.

Canadian Northern Railway, Toronto, Ont.—It is stated that the J. Z. Lajoie Company, which was recently incorporated, is a subsidiary of the Canadian Northern Railway Company to develop the Lajoie Falls to supply power for the operation of this company's tunnel now under construction.

Toronto Suburban Street Railway, Toronto Junction, Ont.—Grading has been completed and track is being laid by this company on its line from Toronto to Guelph.

Pacific Power & Light Company, Astoria, Ore.—This company has announced its intentions to build 2 additional miles of electric railway in Astoria, work to begin as soon as materials and equipment can be placed on the ground. Chief Engineer William H. Galvani is making the preliminary surveys. One extension 1 mile long will be made from the west side terminus to a point in Taylor's Astoria. The other mile extension will be made on Date Street in the east end of Astoria.

Seattle, Port Angeles & Lake Crescent Railway, Seattle, Wash.—This company advises that its proposed 70-mile line to connect Seattle, Oak Bay, Sequim and Port Angeles will be operated by steam. [E. R. J., May 16, '14.]

Fort Worth & Denton Interurban Railway, Fort Worth, Tex.—The following statement has been made by the directors of this company: "A contract has been made with Stone & Webster, by which Stone & Webster are to be given the right-of-way located, surveyed and secured by the Fort-Worth-Denton Interurban Railway, and a bonus of $75,000, conditional that they shall begin at once the construction of the line, and after the constructing to operate it. The payment of this bonus and the expense already incurred will require between 15 and 20 per cent of the subscription of each stockholder."

Guadaloupe Water Power Company, Seguin, Tex.—Plans are being considered by this company to build an electric line to connect Seguin, Lockhart and San Antonio. G. C. Simpson, San Antonio, chief engineer. [E. R. J., April 13, '12.]

***Southwestern Traction Company, Temple, Tex.**—Surveys have been obtained and right-of-way secured for the line between Waco, Temple and Austin. Plans are being made to begin work soon.

Sturgeon Bay, Wis.—Arrangements are complete for the construction of the new electric railway through Door County from Sturgeon Bay to Ephraim. E. E. Galle & Company, Minneapolis, is interested. [E. R. J., Nov. 22, '13.]

SHOPS AND BUILDINGS

Northern Electric Railway, Chico, Cal.—The report is current that in the near future the electric lines entering Sacramento will unite in the erection of a union passenger and freight terminal to be located on the river front in West Sacramento below the M Street bridge. It was said that the companies which will join in the undertaking include the Northern Electric Railway, the Oakland, Antioch & Eastern Railway, the Central California Traction Company, the Vallejo & Northern Railway and the West Side Railroad.

St. John (N. B.) Railway.—This company has awarded a contract to build a new carhouse, in St. John, to A. R. C. Clarke & Son. The building is to be 115 ft. x 58 ft. and of steel and brick construction.

Niagara Gorge Railroad, Niagara Falls, N. Y.—It is reported in Buffalo, N. Y., that an agreement has been reached whereby the Niagara Navigation Company, which controls the boat line between Lewiston, N. Y., and Toronto, Ont., and the Niagara Gorge Railroad, will unite in constructing a large modern terminal in Lewiston. The present terminal facilities have long been inadequate.

Fort Worth & Denton Interurban Railway, Fort Worth, Tex.—Plans are being made by this company to construct a new office building in Justin. A material yard will also be established. Contracts for this work have just been awarded.

Pacific Electric Railway, Los Angeles, Cal.—A new substation will be built by this company on Rialto Avenue between E Street and F Street in San Bernardino. The structure will be of corrugated iron and wood and is to be only temporary.

POWER HOUSES AND SUBSTATIONS

Boston Elevated Railway, Boston, Mass.—This company will install an equipment of new substation apparatus comprising two 2000-kw rotary converters and six 700-kva air-blast transformers with two 14,000 cu. ft. pressure blower sets. The order for the equipment has been placed with the General Electric Company.

Holyoke (Mass.) Street Railway.—All contracts for the repairs and improvements on the power house of this company in Springdale have been awarded, and the undertaking is now expected to be completed in October. The last contract to be awarded was for the mechanical stokers, this contract having been given to the American Engineering Company. The contract for the economizers have also been awarded, this going to the Green Fuel Economizer Company. Both of these complete the list of supplementary equipment needed to complete the improvements planned in the power station. The proposed improvements will double the capacity of the railway. The company is spending about $150,000 on the improvements.

Big Horn Canyon Irrigation & Power Company, Billings, Mont.—Included in the plans of this company is the construction of a hydroelectric plant on the Big Horn River to develop 25,000-hp. J. J. Harris, Hardin, president. [E. R. J., May 2, '14.]

Morris County Traction Company, Morristown, N. J.—This company will place in operation in substations at Wharton, Morristown, Milburn and Boonton, N. J., new apparatus comprising seven 300-kw rotary converters, twenty-one 100-kva transformers and four switchboards. The contract for all the equipment has been awarded the General Electric Company.

Interborough Rapid Transit Company, New York, N. Y.—This company has installed two 4000-kw rotary converters and transformers in its substation at 110th Street and Eighth Avenue, New York, N. Y. The apparatus was

Charlottesville & Albemarle Railway, Charlottesville, Va.—This company will add to the equipment of its substation a 200-kw rotary converter, three 65-kva transformers and a switchboard. The apparatus has been ordered from the General Electric Company.

Ashland Light, Power & Street Railway Company, Ashland, Wis.—During the next four weeks this company expects to purchase a 1000-kw, sixty-cycle, three-phase generator and engine for its power house in Ashland.

Manufactures and Supplies

ROLLING STOCK

Vicksburg Railway & Light Company, Vicksburg, Miss., has ordered two single-truck (St. Louis No. 72) cars from the St. Louis Car Company.

Pier Railway, Port Arthur, Tex., has ordered four single-truck cars from the St. Louis Car Company. These cars will have the St. Louis No. 72 truck.

Marine Railway, Brooklyn, N. Y., has ordered two closed single-truck, 30 ft. 6 in. storage-battery cars from the Railway Storage Battery Car Company, to be equipped with Brill standard trucks and GE-1022 two-motor equipments and control.

Niagara, St. Catharines & Toronto Railway, St. Catharines, Ont., noted in the Electric Railway Journal of May 23, as having ordered six pay-as-you-enter cars, has placed this order with the Preston Car & Coach Company. Destination signs of the Electric Service Supplies Company are specified.

Sanderson & Porter, New York, N. Y., who are operating the properties of the Springfield (Mass.) Street Railway and the Worcester (Mass.) Consolidated Street Railway, have been making a traffic study of these properties with a view of determining the question of providing future rolling stock equipment. Though no definite plans have as yet been made in regard to the equipment, it is likely that a number of open cars will be converted into closed cars, and in addition, new cars may be purchased.

Washington-Virginia Railway, Washington, D. C., noted in the Electric Railway Journal of March 28, as having ordered five closed cars from the Southern Car Company, has specified the following details for this equipment:

Seating capacity 64	Underframe ..... metal
Weight (car body only) 23,000 lb.	Curtain material..Pantasote
Bolster centers, length.28 ft.	Gears and pinions....West.
Length over vestibule, 49 ft. 4 in.	Motors, type and number, 4 West., outside hung
Width over sills....8 ft. 6 in.	Paint .... Sherwin-Williams
Width over all....8 ft. 9 in.	Registers ..... Ohmer
Height, rail to sills....34 in.	Sanders ..... Ohio brass
Height, sill to trolley base, 9 ft. 1 in.	Sash fixtures..... Edwards
Body ..... metal	Seats, style ..... H. & K.
Interior trim ..... cherry	Seating material .... rattan
Headlining ..... Agasote	Trucks, type..Standard 55-C
Roof ..... arch	Varnish....Flood & Conklin
	Ventilators .... Ry. Utility

Morris County Traction Company, Morristown, N. J., noted in the Electric Railway Journal of March 28, as having ordered ten all-steel interurban cars from the Cincinnati Car Company, has specified the following details for this equipment:

Seating capacity 50	Gears ..... solid gears
Weight (car body only) 17,500 lb.	Gongs ..... 14 in.
Length of body.....36 ft.	Hand brakes ..... Giant
Length over vestibule..47 ft.	Heaters ..... Peter Smith
Width over sails..8 ft. 3¾ in.	Headlights .. Crouse-Hinds
Width over all..8 ft. 6¼ in.	Journal boxes, 3¾ x 7 in., M. C. B. type
Height, rail to sills..34¼ ft.	Motors...G. E., inside hung
Height sill to trolley base, 8 ft. 4½ in.	Registers.....Internat'l R-7
Body ..... metal	Sanders ..... Ohio brass
Interior trim .... mahogany	Sash fixtures ..... Dayton
Headlining .... carline finish	Seats, Hey. Bros. & Wakefield
Roof ..... arched	Seating material.....rattan
Underframe ..... metal	Step treads ..... Mason
Air brakes ..... West.	Trolley catchers, Earll No. 5
Bumpers..5 in. steel channel	Trolley base .... Ohio brass
Car trimmings ..... Dayton	Trucks, type....Taylor L. B.
Control ..... Type K	Ventilators ..... Cincinnati
Couplers.Cin. Car Co. radial	Wheels .. 34-in. rolled steel
Curtain fixtures, Nat'l L. W. Co.	Special devices, Monitor signal bells, O-B elec. signal equip., Rico sanitary hand straps
Curtain material..Pantasote	
Destination signs, illuminated dash signs	

TRADE NOTES

Hubbard & Company, Pittsburgh, Pa. have appointed Victor L. Crawford to a position with the company. Mr. Crawford was formerly connected with W. L. Matthews & Brother.

Clark Electric & Manufacturing Company, New York, N. Y., is putting on the market a new type of overhead protective clamping set for use at overhead line crossings. This set is designed to protect the conductor against arcs and to prevent any section of the conductor from becoming strained, due to severe tortional and possibly alternate stresses.

Industrial Works, Bay City, Mich., announces that its Chicago agency, which has been with Mudge & Company, has been discontinued. For the present the Chicago territory will be handled from the main office in Bay City, but in the near future a sales office will be opened in Chicago under the name of the Industrial Works.

Galena-Signal Oil Company, Franklin, Pa., has been conducting an extensive advertising campaign in the daily newspapers by the publication of an official letter of the company recently issued to its stockholders. The letter, among other things, calls attention to the extent of its business, and states that the Interborough Rapid Transit Company and the Manhattan Elevated Railway have been its customers since these two companies were formed; also all the companies operating street cars in New York City and all the lines of the Brooklyn Rapid Transit. The street car department commenced supplying oils to trolley lines and street railways in 1890 and is now supplying the lubricating oils for about 75 per cent of the total street car mileage in this country.

Walter A. Zelnicker Supply Company, St. Louis, Mo., has appointed J. D. Fidler, formerly secretary of the Acme Cement Plaster Company, as traffic and office manager. Mr. Fidler's railroad experience dates back to 1889, when he entered the Dayton and Union Railroad service at Arcanum, Ohio. Until 1908 Mr. Fidler was connected with commercial or traffic railroad work for such roads as the Big Four and Detroit Southern, Toledo, St. Louis & Western, Baltimore & Ohio Southwestern and the Frisco Railroad. In May, 1908, he became traffic manager for the Acme Cement Plaster Company, being appointed secretary in 1910, and leaving that company, on Jan. 1 to join the Walter A. Zelnicker Supply Company. G. H. Dixhold, for twelve years advertising service manager for the Simmons Hardware Company and formerly editor of *Hardware*, New York, N. Y., has been appointed advertising and publicity manager of the Zelnicker Supply Company.

ADVERTISING LITERATURE

Ford Manufacturing Company, Brooklyn, N. Y., has issued Bulletin S describing the company's differential staffless brake.

T. C. White Company, St. Louis, Mo., has issued a catalog describing and illustrating the company's porcelain strain insulators.

Mesta Machine Company, Pittsburgh, Pa., has issued a catalog describing and illustrating its rope drives for steam engines, dynamos and motors.

Link-Belt Company, Chicago, Ill., has issued a catalog describing and illustrating its link-belt portable wagon and truck loaders for loading coal, sand, stone, gravel and other loose materials from ground storage.

Independent Pneumatic Tool Company, Chicago, Ill., has issued a circular describing its Thor portable electric drill for sheet metal work. It may be equipped with d.c. or a.c. motors, and with breast plate, grip handle, screw feed or button handle, as desired.

Barrett Smith, Boston, Mass., has issued three advertising leaflets relating to three patrons of this advertising management, Stone & Webster Engineering Corporation, Boston, Mass., Lombard Governor Company, Ashland, Mass., and Daigneau & Company, Salem, Mass.

Chance Manufacturing Company, Centralia, Mo., has issued Bulletin No. 3, describing its never-creep anchor for use in connection with trolley spans on curves. This anchor pulls entirely against solid and undisturbed earth. All the disturbed and moisture affected earth is below and behind the anchor.

Gold Car Heating & Lighting Company, New York, N. Y., has issued a catalog describing and illustrating its various types of ventilated core electric heaters, electric heater fronts and cases, spring clip terminals, improved rod type electric heaters, thermostatic control apparatus and ventilators for railway cars.

Industrial Works, Bay City, Mich., has issued Bulletin No. 212 describing its power wheel and high-power clamshell buckets used by contractors, coal dealers, power houses, railways, steel plants, ore docks, cement mills, chemical works and smelters for handling earth, coal, coke, ashes, ore, rock, ballast, gravel, sand, etc.

Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., has issued its sixth bulletin giving comparative results of tests on standard open-hearth rail and on titanium-treated rail. The bulletin contains the remarkable series of sulphur prints, etchings and micrographs that have characterized the previous bulletins and presents a detailed discussion on the results obtained from the chemical analyses and from the physical tests on strength, elongation, hardness, impact resistance and endurance that were made upon the samples which were sent in by a large eastern steam railroad.

Texas Employers' Insurance Association of Taxes, Dallas, Tex., created in accordance with the employers' liability act, has issued a prospectus describing the organization, rates, legal aspects and probable cost of administration of the association. This association was formed for the sake of providing employers in the State of Texas protective insurance against injuries to workmen coming under the new compensation law. It is restricted in membership to employers of labor in the State and to those employers who elect to provide workmen's compensation instead of standing on the three old common-law defences. Membership in the association results in an injured employee having no cause of action against the employer but against the association. Moreover, if an employee brings suit against an employer for common-law damages instead of compensation the employer is protected, for he can recover from the association the amount of judgment and costs. It is estimated that the cost of administration will not exceed 15 per cent. of the premiums and probably not half that percentage after its costs and benefits are fully understood. The rates of the association are about 35 per cent less than those filed and approved by the stock companies of the State prior to the organization of the association.

NEW PUBLICATION

The Careful Investor, by Edward Sherwood Mead, Ph.D. J. B. Lippincott Company, Philadelphia, Pa., 283 pages. $1.50 net.

The author is professor of finance in the Wharton School of Finance and Commerce, University of Pennsylvania. Two previous books by him, "Trust Finance" and "Corporation Finance," are classics of their kind and indispensable to the student of corporation problems. The present volume differs materially from the others. It was contributed in part originally for magazine publication. This accounts, perhaps, for the chapter heading "A Lamb in the Stock Market," with which the book is introduced. The author has clearly described the different forms of investments, showing the advantages of some over others, the dangers to avoid, etc. There is much information in the book of value to the younger men in the electric railway industry, particularly in the chapters "A Reasonable Return," "Public Service Corporations," "The Public Utility Company" and "The Public Service Corporation and the City." Few of Professor Mead's statements seem to be open to criticism. He has illustrated briefly by citing the Chicago, Philadelphia and New York franchises how the problem of the relations between the cities and the public service corporations are being worked out. He has also used the electric railway industry to illustrate the law of increasing returns. Professor Mead says that there is only one sure test of the character of a banking house—its record of flotations. His advice to the investor in short is that before buying he investigate the record of the house which offers the securities.