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TIMBER SPECIFICATIONS NEEDED

Among the urgent needs of the electric railway industry brought out in the A.E.R.E.A. way committee's report on preparation of specifications for preservatives and the treatment of timber are specifications for ties, poles, cross-arms, lumber and bridge timber. On the basis of 1050 miles of track extensions annually and complete tie and pole renewals every ten years, the annual requirements of the electric railways are of the order of 10,000,000 ties and 300,000 poles. There does not seem to be any reasonable way of arriving at the total annual lumber and bridge timber requirements, but it is safe to assume that it is more than 50,000,000 ft. B. M. When taken collectively, this represents a large order for these materials and brings out very forcibly the need for specifications to govern their purchase. Even though ties, poles and bridge timber are being treated by some preservative method, their structural qualities should conform to specifications for first-class timber. In other words, it is more economical to treat timber of first quality than to treat inferior grades. Treatment will not remedy the defects, and the presence of decayed fungi, even though the timber is treated, makes it less resistant against their attack.

THE TRANSFER PRIVILEGE

That a transfer is a privilege is a point which should never be overlooked by a company in its negotiations with the public. To prove that this is the case, it is not necessary to go back to the time when the existing railway system in practically every city consisted of a number of unconnected properties so that to travel from one point to another in the city several fares had to be paid. Of course, this is most convincing evidence of the benefit to passengers of transfers, but the memories of most people will not go back to that time, and the point to be proved more often is that a transfer is as satisfactory as through service when the transfer is introduced to permit a change in car routing. Admittedly, the transfer *per se* is an inconvenience, but if the passenger will look further to determine the cause of its introduction, he will find the basic reason is his own benefit. In nearly every case it is to permit him to use for part of his journey a trunk line on which cars are run at a higher speed or at a greater frequency than if through service to his destination was run. Hence, a transfer from a relatively slow and local service to a line of higher speed and increased frequency of car movement is a direct benefit, and the mere physical inconvenience of the change is generally a small price to pay for the saving in time gained by the passenger.

THE EYES OF THE COMMISSIONS

The latest annual report of the Missouri Public Service Commission, as shown in our last issue, states that the public and the utilities in Missouri are now on excellent terms, as evidenced by the small number of informal complaints, this condition being largely the result of broader and more liberal policies on the part of utilities in their dealings with the public. During the year few complaints were made as to unfair or discourteous treatment of the public by utility agents or employees, and the conditions between the utilities and their employees are being greatly improved. These words of commendation are worthy of note, particularly because they illustrate the importance that is attributed to the subject of better public relations by the Missouri commission. Nor does this body stand alone in that respect. H. L. Geiss, secretary Wisconsin Railroad Commission, stated last March before the Wisconsin Electrical Association that much could be said as to the advisability of giving the public relations of utilities considerable attention in connection with authorizations for security issues. Moreover, the Illinois Public Utilities Commission, in its recent Springfield Gas & Electric valuation decision, remarked that "a utility excellently managed, progressive in development, alive to public requirements, economical in operation, courteous to patrons and fundamentally honest in all transactions, should receive greater consideration, in the fixing of a fair rate of return, than should a utility of which the reverse is true." These instances clearly indicate the increasing recognition that commissions are giving to the good and the bad public relations of utilities. Virtue may be its own reward, but it is worth while to remember that there may be other and more material rewards, and that, on the other hand, the lack of proper conduct is being watched by the observant eyes of not impotent authorities.

THE CRUX OF THE JITNEY QUESTION

The decision of the New York Public Service Commission, Second District, in the Rochester jitney case, published in abstract in last week's issue, is the clearest exposition of the whole matter which we have seen from a public body. The commission admits that the jitneys possess certain advantages for city transportation and that some people, perhaps many people, would enjoy making occasional use of them. The broad question, however, is not whether the jitneys are often a convenience to the citizens of Rochester, but whether the interests of the city as a whole will be promoted by permitting their competition with the existing electric railway system. The facts are that the

transportation field in Rochester, and the same is true of most other cities, is limited, so that the encouragement of the jitneys will necessarily mean arrested development of the railway and possibly its slow death. Hence, the real question at issue is not whether the jitneys have or have not some desirable features, but whether they can replace the electric cars as a whole or in very large part, to the benefit of the citizens. To this, in the opinion of the commission, there is but one answer: "No dependable form of transportation, good alike in winter or summer, has yet been devised to take the place of what Rochester would lose if further development of its electric railway was to be discouraged and interfered with by the State." The jitney situation in Rochester was clearly set forth in the issue of the *ELECTRIC RAILWAY JOURNAL* for Dec. 11, 1915, page 1175, where the data for 1915 were shown graphically. Between Jan. 1 and May 20, 1916, approximately 675 jitney licenses were issued on the same basis that the city issued tax licenses, the license fee being \$1 and covering a period of one year. On June 1 there were fewer than 500 jitneys in operation, and the number steadily declined as the season advanced. During this period the jitney buses were operating illegally, as their operators were required by State law to secure certificates of public necessity and convenience from the Public Service Commission. This year in attempting to comply with the law they have been met by the sweeping decision referred to. The position taken is one which should appeal to other commissions which must face the same situation.

CONVENTION REPORTS IN THE "JOURNAL"

May is a popular month for technical conventions, and among those to hold annual meetings within the last few weeks have been the Southwestern Electrical & Gas Association, the State electric railway associations of Pennsylvania and Iowa, the National Electric Light Association and the American Institute of Electrical Engineers. The programs of such associations, acting like concave mirrors, are apt to reflect and focus the problems of the industry, so that we believe that the extended and prompt reports of these meetings which have been published in the columns of this paper in the last few issues will be appreciated by our readers. After all, only a relatively small number of men interested in electric railway problems can attend a convention, but if those who cannot attend are able to read an account of a meeting which was considered important enough to occupy the time of large numbers of their fellow workers, the value of such meetings is greatly enhanced.

A survey of the various railway conventions held during May discloses clearly the fact that the labor problem is one of the most pressing. By this we do not mean matters of hours and wages, because these are largely for local adjustment, but rather the scientific selection, examination and training of employees which involve the application of general principles and merit the attention which they have received in recent meetings. Judged by the number of papers presented,

the topic second in importance at present is the development of passenger, freight and express traffic. More business is what the railways need, and they must take active steps to get it. Competition with the privately-owned automobile makes necessary the employment of the best methods to hold existing business while reaching out in new directions. This and the waning jitney competition have taught important lessons in the line of frequent and speedy service. As a result, the one-man car is a never-failing stimulant to discussion. While the managements are struggling with the development of the human side of the railway systems, are adapting equipments and methods in order to meet competition, are reaching out for new business and are endeavoring to maintain friendly relations with the public, the technical departments are meeting them half-way by keeping down operating costs. This is being done, if the convention discussions are trustworthy, through the use of materials best adapted to several uses, conscientious inspection and repair of equipment, and the use of devices for enforcing energy saving and efficient use of apparatus.

The editorial problem in reporting conventions is to condense without loss of data or distortion of point of view, and especially without eliminating the personality of the speakers. Convention papers are usually not illustrated, so that the reports are apt to appear formidable. They do, however, contain the facts which are needed in the railway business, and the progressive man in this field is the one who utilizes this as well as other means to keep informed. Managers are amply justified in expecting and requiring their subordinates to know what other companies are doing, when the facts are placed within their reach in these report issues.

BOSTON ELEVATED TAKES IMPORTANT STEP

A significant step was taken this week by the Boston Elevated Railway in a letter to Governor McCall of Massachusetts, asking for the appointment of a special commission to investigate the company's need of additional net revenue and to report its findings to the next Legislature. The promptness with which the Governor sent a special message to the Legislature recommending the designation of such a commission gives good grounds for hope that the inquiry will be conducted during the forthcoming recess, in which case a most interesting set of hearings may be anticipated. Whether or not such action is taken at this time, however, the company's course indicates that a turning point has arrived in its policy, and that this is the beginning of a movement to put the road upon a new plane of financial stability.

Readers of this journal have often been informed of the enormous burdens laid upon the Boston company by the rapid development of subway and tunnel lines in the last decade and a half, by the multiplication of transfer facilities, the demands of the public for increasing accommodations in the way of service, and the rising cost of labor and materials. In common with many other roads, the Boston Elevated has had to face the growing cost of operation and the more exacting

requirements of the traveling public, but to an unusual extent the burdens of fixed charges have increased upon it through the insistence of the metropolitan community upon the construction of more and still more rapid transit lines. All through this period the company has also had to make its plans and perform its duties under the severe limitation of its charter, in which a fixed fare unit of 5 cents is specified for a journey between any two points on the system in the same general direction, while the onerous requirements of taxation have made it still more difficult to earn even savings bank interest upon its capital.

Without an express fare limitation in its charter, the company might have appealed directly to the Public Service Commission for authority to increase its fares, to make a charge for a transfer or to modify its service possibly along more economical lines, had any one of these plans seemed feasible. Under the circumstances, however, a direct appeal to the Governor marks a step of equal significance, and the recommendation of the latter that the Public Service Commission as well as the Boston Transit Commission, be a member of the recess board desired to make the inquiry, looks toward a concentration of expert knowledge in the proposed tribunal which will undoubtedly be most helpful in case the Governor's recommendation is enacted. The step taken is, of course, of wider significance than if its consequences were confined to Boston. Other companies have felt the effect of increased cost of operation, and the conclusions reached in Boston will undoubtedly have an influence on the solution of similar problems elsewhere.

The ways by which net revenue under the conditions prevailing at Boston can be increased need not be discussed at this time, but as a broad proposition, we believe that once it is demonstrated that a well-managed electric railway needs relief in order to hold up its head as one of the prospering concerns of a community, the citizens will prefer that such relief be afforded rather than to undergo the lowered standards of service and credit which are the final result of a close-fisted public policy, if indeed no worse fate befalls.

RAPID TRANSIT IN PHILADELPHIA

Philadelphia, by a popular vote of three to one, has approved a comprehensive plan for the construction of subway and elevated lines reaching every section of the city. The estimated cost of the new construction, excluding the cost of rolling stock, track and signals, exceeds \$57,000,000. The loan ordinance specified in detail the routes to be followed.

The recent developments in Philadelphia are of significance to the entire electric traction industry, not only because of the size and importance of the new construction but more especially because of the principles which underlie the recent controversy as to what rapid transit lines should be constructed. The new lines were planned by the former director of city transit, A. Merritt Taylor. With a change in city administration on Jan. 1, William S. Twining, well known to traction officials, was appointed director of city transit. Mr. Twining had been in close touch with the

formulation of what were colloquially known as the "Taylor plans," having been expert adviser to the former director of city transit.

Mr. Twining, upon assuming office, recommended a revised and curtailed plan of construction. He pointed out that the Taylor plans would involve a cost of such magnitude that the lines would not be self-supporting for twenty-five years. The aggregate deficit would exceed \$30,000,000 and would average more than \$1,000,000 a year. Mr. Twining also pointed out that no arrangement had yet been made for an operator, and an extensive construction program was inadvisable until this matter was settled. Again, the cost of all building material and labor was at present high, and owing to the European war the course of prices during the next three years could not be predicted, but any contractor for the work would naturally have to protect himself. If the Taylor plans were to be carried out, therefore, one of two alternatives would have to be accepted. The first was an increase in the tax rate of from 10 to 15 cents per \$100 of assessed valuation.

Inasmuch as all sections of the city would not share equally the advantages of the new facilities, Mr. Twining recommended as the most equitable method an advance in the rate of fare on both the surface and rapid transit lines to a point sufficient to make them self-sustaining. By elaborate calculations, he demonstrated that to render the unified system self-sustaining, a rate of fare of about 7 cents, with universal transfers, would be required. He recommended the sale of "seven tickets for 40 cents" with successive adjustments in the rate of fare to lower levels as the traffic on the system increased. By 1950, the rate of fare would reach approximately 5 cents.

From the standpoint of common prudence, there is no doubt that Mr. Twining's suggestion had much to recommend it. The citizens would be paying directly for the improved transit facilities rather than indirectly through increased real estate taxes. The suggestion met with popular disfavor. An increase in the rate of fare was a definite, calculable amount which even the dullest could measure in terms of his personal budget. The possibility of an increase in real estate taxes was more remote, particularly as the interest on the new bonds could be charged to construction until the lines were completed.

Mr. Twining also submitted an alternative proposal involving the construction of a smaller mileage of high-speed lines in the congested sections of the city. To the termini of these lines would be converged the surface lines serving the outlying sections. This plan he recommended as the best solution of the problem, pointing out that it is in accord with the well-settled scientific principles of the functions of rapid transit lines.

The matter was decided by the voters of Philadelphia, not on the basis of prudence, but on the basis of locality desires. Probably only a small percentage of the voters understood the deficits which would be incurred. They desired the new transit facilities, and they postponed the question as to how they should be supported until some future time.

The Lake Erie & Northern Railway

This New 1500-Volt Electric Passenger and Freight Line Has Recently Been Opened Between Galt and Brantford, Ont.—Operation Will Shortly Extend Between Galt and Port Dover, 53 Miles

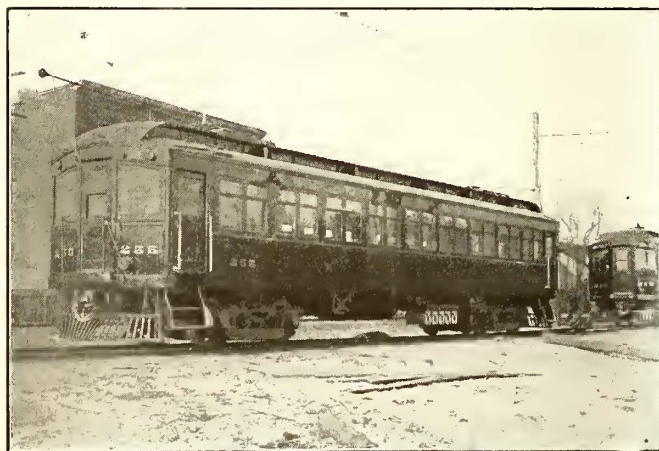
ON Feb. 7, 1916, a frequent transportation service between Galt and Brantford, Ont., was inaugurated by the opening of the new 1500-volt line of the Lake Erie & Northern Railway, Brantford, Ont. This railway has been leased to the Canadian Pacific Railway for 999 years. It is now being extended to Port Dover, the roadbed and tracks of this section having already been completed. When this new extension is placed in operation, as expected shortly, there will be a direct two-hour connection between Galt and Port Dover on Lake Erie, a distance of 53 miles, which will afford people in the cities and towns along the line a comfortable and convenient means of reaching the lake shore. The route lies through a district of unusually attractive scenery. Between Galt and Brantford the line follows the beautiful valley of the Grand River. On nearing Simcoe and the Port it passes through a fertile and progressive agricultural section.

The new railway promises to be an important factor, from an industrial standpoint, in the development of

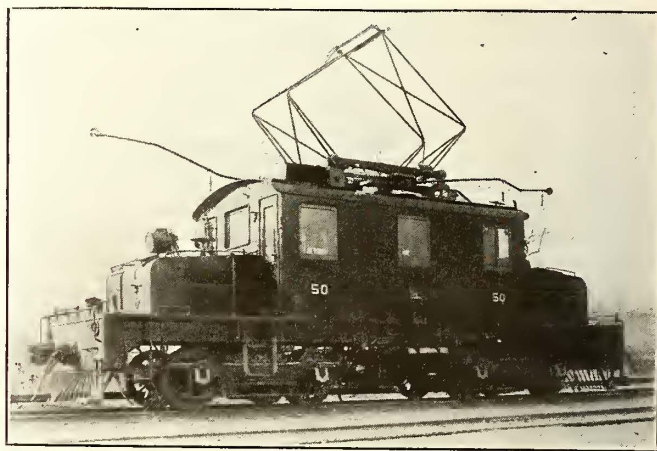
more than six of these crossings and in every case a good view can be gained of the railway on approaching the line. All crossings are marked with conspicuous danger signs. By selecting a route along the Grand River bank the new line keeps away from the main road.

As the line pressure is 1500 volts, catenary construction is employed and includes an aluminum messenger steel-center feed wire and a steel trolley wire suspended under the feed wire by hangers.

The station at Paris, shown in the accompanying illustration, which overlooks the town from the east, is of red brick and stone, built low with a sloping roof. The station is divided into two well-lighted waiting rooms and lavatories. There is an attractive ticket office in the center of the large room. The building is steam heated. The interior woodwork is of the mission style in natural finish. The walls are covered with green burlap half-way up, and the remainder is tinted cream, which harmonizes with the green and woodwork finish. The ceiling is tastefully arched. The station



LAKE ERIE & NORTHERN RAILWAY—EXTERIOR VIEW OF PASSENGER CAR



LAKE ERIE & NORTHERN RAILWAY—VIEW OF 60-TON LOCOMOTIVE

this district. It will provide a direct freight line connecting with the Canadian Pacific Railway's main line at Galt, which has long been needed in the territory served. Shippers from Brantford and Paris and other points south will thus have a more direct freight delivery to Toronto and points east. The roadbed of the new line, having been originally built for a steam road, is well adapted for freight service, the slight grades on the lines making it possible to haul large trains. Freight service was put into operation between Galt and Brantford on March 1.

CHARACTERISTICS AND EQUIPMENT OF LINE

The maximum grade on the line is 1 per cent, while the maximum curvature is 6 deg. The width of the roadbed is 16 ft. at fills which are less than 10 ft. high; in fills over 10 ft. high the width is increased 0.2 ft. for every foot in elevation. The rails are 85-lb., and the line is gravel ballasted.

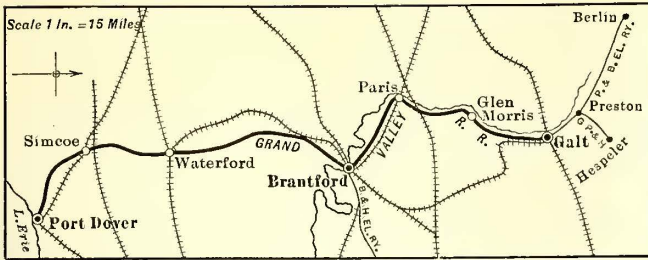
An important feature of the new line is the few grade crossings. From Galt and Brantford there are not

at Glen Morris, illustrated herewith, is substantially built of stone.

Just before reaching the present Brantford terminus of the line at Lorne Bridge there is a large freight shed and brick carhouse, near which is also located a substation, illustrated on page 987. At present the stop at Brantford is made a short way from Lorne Bridge, but as soon as the weather permits, work on the new station will be begun. It will be erected on the east side of Lorne Bridge and will be built over the railway tracks. The main floor will be on a level with the street, and there will be a stairway down to the train below.

PASSENGER CARS

The Lake Erie & Northern Railway has started with a passenger equipment of eight vestibuled interurban passenger cars, including six motor and two trail cars. Six of the cars are straight passenger and two are combination passenger, express and baggage, and they were supplied by the Preston Car & Coach Company. With this equipment the trip from Galt to Brantford is made



LAKE ERIE & NORTHERN RAILWAY—MAP OF LINE



LAKE ERIE & NORTHERN RAILWAY—BRICK AND STONE STATION AT PARIS, ONT.

in fifty-five minutes, while the round trip takes two hours. For the present the cars will be operated on a two-hourly schedule, but as soon as connection can be made with the Brantford & Hamilton Electric Railway it is likely that an hourly service will be put into effect between Galt and Brantford.

The design of the cars involves the use of composite framing, as used in steam railroad service. Especial attention was accorded to the importance of having the general scheme of design conform to steam railroad practice and yet not include any unnecessary weight of material. The principal dimensions are as follows:

Length over buffers (free).....	59 ft. 7 in.
Length over body corner posts.....	48 ft. 9 in.
Length of main compartment.....	32 ft. 1/2 in.
Length of smoking compartment.....	16 ft. 1/2 in.
Length between truck centers.....	36 ft. 9 in.
Length between cross-ties.....	8 ft. 0 in.
Length between body corner post and vestibule end post.....	4 ft. 2 in.
Width over side posts.....	9 ft. 4 in.
Width between reversible seats.....	3 ft. 3 in.
Width between window posts.....	2 ft. 3 1/8 in.
Width of aisle.....	2 ft. 1 in.
Height, rail to top of roof.....	12 ft. 11 1/2 in.
Height, rail to under-side of sill.....	3 ft. 6 1/2 in.
Center to center of seats.....	2 ft. 8 in.
Wheel diameter.....	36 in.
Seating capacity.....	70

The cars, one of which is shown in an accompanying illustration, are of the monitor deck type of construction, with square deck sash and Gothics, having side sash of the lifting type. Single body sashes are provided in conjunction with a set of storm sashes for use during the winter only. The vestibule steps, on all four corners, are fitted with three risers, and trapdoors extend under the vestibule side doors for use with high station platforms, if necessary.

The center construction of the underframe is composed of two 8-in. steel channels 15 1/2 in. apart, back to back and forming a box girder with top plate 1/4 in. thick and bottom plate 3/8 in. thick, both 20 in. in width. This member absorbs all buffing and pulling strain, the

draft rigging and spring buffing mechanism being riveted directly to it. The entire load of the body is carried on the side girders, which are of 1/8-in. x 36-in. plate stiffened at the lower edge by an angle and at the upper edge by a steel belt rail. Additional flange area is provided by the usual bent-angle, side post plates and steel corner posts.

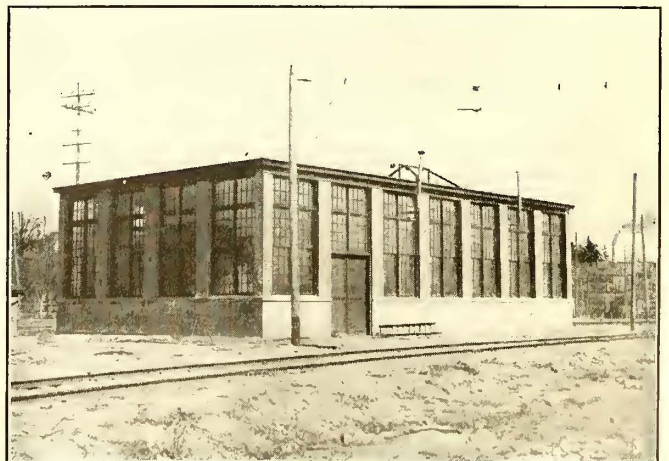
The wooden roof framing is supplemented with a steel carline over each wide pier, and so arranged that ample support is provided for pantograph bases at each end of the car. No. 10 cotton duck, laid in white lead and linseed oil, is stretched over the roofboard and tacked in place.

Vestibules are designed to conform with standard steam railroad car practice, the canvas diaphragms only being omitted, and a swing door is provided at the end opening, in order that the entire vestibule may be used for a motorman's cab on the motor cars, and making it possible to convert any additional trail cars to motor-car service by simply installing the necessary wiring and equipment. The vestibule steps have steel sides, wooden treads and composition tread plates. Motormen's mirrors are installed on the vestibule corner posts at diagonal corners. A metal pilot is supported from the platform framing at each end of the car.

The cars have a seating capacity of seventy. They are divided by a half glass partition into a main passenger and a smoking compartment. The passenger compartment is finished in mahogany with a square ceiling and beams, while the smoker is finished in quartered oak, mission style and also with a beam ceiling. Five Automatic ventilators are provided on each side of the car. Window curtains are of Pantasote with all-metal



LAKE ERIE & NORTHERN RAILWAY—STONE STATION AT GLEN MORRIS, ONT.



LAKE ERIE & NORTHERN RAILWAY—SUBSTATION AT BRANTFORD, ONT.

rollers and spring pinch fixtures. All of the cars, both passenger and trailer, are provided with twenty-seven low back walkover seats and eight stationary seats, all upholstered in Pantasote. Each walkover seat is fitted with the usual corner hand grab. Each set is connected to an annunciator push button system. Eight basket racks are installed in the main compartment, and two in the smoking compartment. The car is equipped with emergency tools.

A lavatory is located adjacent to the swing door in the body. A water cooler alcove is provided in the corner of the saloon partition. Instead of the usual metal cooler, an inverted glass water bottle scheme has been developed.

Car wiring is inclosed in steel conduit, with the usual outlet and junction boxes. The lighting of the cars is of an attractive and serviceable design. There is a lighting system of three circuits, twelve lights to each circuit. There are four large globes in the center of

principal dimensions of the locomotive are as given in the following table:

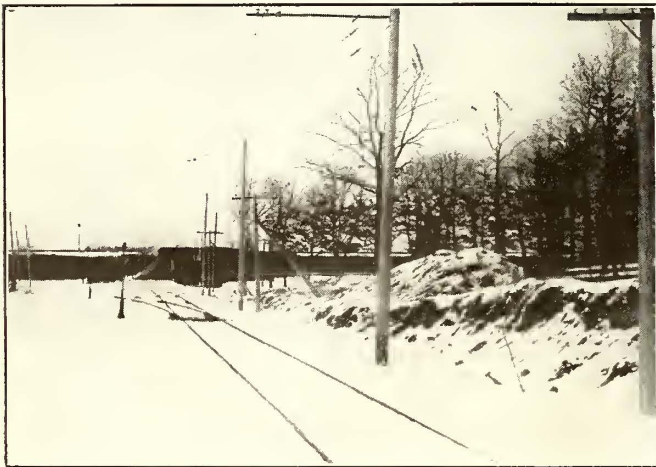
Distance between truck centers.....	17 ft. 8 in.
Wheelbase, each truck	6 ft. 8 in.
Wheelbase, total	24 ft. 4 in.
Diameter of driving wheels	36 in.
Width over all	10 ft. 0 in.
Height over all	12 ft. 10 in.
Length, center to center of coupler knuckles.....	37 ft. 6 3/4 in.

The motors are of the Westinghouse 562-D-5 type, designed for high potential, direct current. The two commutating-pole motors are permanently connected in series so that the voltage across each is 750. Their nominal rating is 75 kw. They have forced ventilation, but also have fans on the armature shafts of a capacity sufficient for operation at three-quarter load in case of accident to the blower. The control equipment used on the locomotive is HB electropneumatic.

PERSONNEL

The officials of the Lake Erie & Northern Railway are as follows:

President, E. W. Beatty, Montreal, Que.; general manager, Martin N. Todd, Galt, Ont., who is also president of the Galt, Preston & Hespeler Street Railway; freight and passenger agent, C. J. Whitney, Preston, Ont.; superintendent, M. W. Kirkwood, Galt, Ont.; engineer, F. H. Midgley, Galt, Ont.; general foreman, J. J. Morrissey, Brantford, Ont. The main office is at Galt.



LAKE ERIE & NORTHERN RAILWAY—TRACK AND OVERHEAD CONSTRUCTION AT PARIS, ONT.

the ceiling, each containing three lamps, and twelve single-lamp droplights on each side of the flat lower deck. There is a separate circuit for the four marker lights, which are fed by two batteries.

The Canadian Westinghouse Company has supplied six 1500-volt quadruple motor equipments, electrical equipment for two trail cars and air brakes for both motor and trail cars. Each motor car equipment consists of four 85-hp. ventilated motors, with AB unit switch type of control. Ordinary wheel trolleys will be used at first, but the cars are so arranged that pantographs can be installed in place of the wheels or auxiliaries. The trailers are equipped with control apparatus, so that a train may be operated from any platform without switching the cars. Tomlinson couplers are provided for train operation.

The trucks weigh 12,800 lb. each or 25,600 lb. per car. The air-brake equipment, including the compressor, weighs 2800 lb. Electrical equipment, including control and wiring, weighs 17,000 lb., and the bodies complete weigh 34,725 lb., which give a total car weight without passengers of 80,125 lb.

ELECTRIC LOCOMOTIVES

The Lake Erie & Northern Railway has received two 60-ton electric locomotives, one of which is shown in an accompanying illustration, of the eight-wheeled double truck type. The locomotives will handle standard freight cars, and Canadian Pacific passenger cars, the maximum train load being about 800 tons. The

Automobile Inspection of Subway

Citizens in automobiles recently drove under the Harlem River and through a New York subway line. The remarkable feat was made possible by the new Lexington Avenue subway and its Jerome Avenue branch, which are so far completed that the trip by automobile was possible from 157th Street down to Sixtieth Street, passing in this trip through the new Harlem River tubes. It was made by the Public Service Commissioners for the First District, several members of their staff, and a few invited guests, including Theodore P. Shonts, president, and Frank Hedley, vice-president and general manager of the Interborough Rapid Transit Company, which will operate the new line. The distance covered was about 5½ miles, and the trip was made to inspect the work. Frequent stops were made for flashlight photographs. This subway structure is completed from 157th Street to Fifty-third Street, and track laying is already under way upon the Bronx portion of the line.

Progress of Electrical Utilities in Great Britain

Eighteen years ago, in Great Britain, there were only thirty-eight electricity supply companies, with a capital of \$29,220,000, and thirty-three municipalities owned electricity works with a capital of \$9,740,000. Eighteen years ago there were seventeen privately-owned electric traction companies in Great Britain, with a capital of \$34,090,000. This gives a total of eighty-eight concerns, with a capital of \$73,050,000. To-day there are 276 companies owning electricity works, having a capital of \$297,070,000; 328 municipalities own electricity works with a capital of \$253,240,000; besides 172 traction companies with a capital of \$891,210,000; and 175 municipalities have electrically operated tramway systems, with a capital of \$258,110,000. These figures represent a total of 951 concerns and a capital of \$1,699,630,000.

Meeting of Southwestern Association

At the Annual Meeting at Galveston, Last Week, the Subjects of Railway Interest Discussed Included One-Man Cars, Coasting Recorders, Paving, Selection of Employees, Car Maintenance and Traffic Development

THE twelfth annual convention of the Southwestern Electrical & Gas Association was held at the Hotel Galvez, Galveston, Tex., on May 17-19. Abstracts of three of the papers presented at the meeting were published in the issue of this paper last week. An account of the general meetings and of the railway sessions, with abstracts of the railway papers not published in the issue of May 20, follow.

The convention opened in the late forenoon of May 17 with an address of welcome by Hon. Mart H. Royston, city attorney of Galveston. Mr. Royston's remarks were not so much a welcome to the members as visitors, but as returning friends, for this was the fifth convention held in Galveston. The response to the address was delivered by W. B. Head, assistant to the president Texas Power & Light Company, and Mr. Head said that the members of the convention were glad to return to "Good old Galveston."

The attendance at the convention was very satisfactory as regards numbers, and included representatives from most of the electric railway and electric lighting companies throughout the Southwest, as well as representatives of supply houses from all parts of the country. The secretary's report on membership showed that the number of new members taken in about offset that of old members dropped.

The president's address was delivered by President David Daly, with W. B. Head in the chair. This address, given in abstract elsewhere, dealt with the vital question now uppermost in most cities of Texas—the jitney situation. The other business transacted at the opening meeting was the appointment of various committees.

THE RAILWAY SESSIONS

After the general meeting the convention divided into sectional sessions. At the railway session on Wednesday afternoon the first paper presented was that on "Practical Methods of Paving as Applied to Street Railways," by W. M. Archibald, superintendent maintenance of way Houston Electric Company. This paper is published in abstract elsewhere in this issue, and was discussed by S. E. Mason, assistant manager San Antonio Traction Company; D. A. Hegarty, president Texas Southern Electric Company; V. W. Berry, general superintendent Northern Texas Traction Company; G. H. Clifford, first vice-president and local manager Northern Texas Traction Company, and H. S. Cooper, secretary of the association.

Mr. Mason brought out the difficulty encountered in paving railroad crossings. One method, which was described by him and has given satisfaction, is to lay a 12-in. concrete base and then 12 in. of gravel under timbers 12 in. x 14 in. or 12 in. x 12 in. The ties are laid upon this foundation, and the spaces are filled in with gravel. After about six weeks of use the track is jacked up to its former position and the space below is again filled in with gravel. Broken stone is placed from the bottom to the top of tie, tamped hard and flooded with hot paving filler, and again tamped with a hot tamper. Two inches more of broken stone are added, and the whole is tamped and flooded with filler

again. Crossings laid in this manner have now been in use for three and one-half years without repair.

Mr. Hegarty advocated the use of a pocket for the tie constructed in the concrete base, this pocket to be ballasted and drained. He also strongly advised that all new track be gone over carefully and all joints be ground smooth. This, he believed, would save a great deal of future grinding. Mr. Cooper spoke forcibly in favor of welded joints, maintaining that it was absolutely unnecessary to make allowance for expansion and contraction when the track is laid on a concrete base and the street is paved.

The next paper was on "Economical Maintenance of Cars, City and Interurban," by Fred. L. Bennett, master mechanic Houston Electric Company, and was read by the secretary, Mr. Cooper. It is published in abstract in another column. Those who discussed this paper were V. W. Berry, general superintendent Northern Texas Traction Company; W. E. Wood, superintendent of transportation Houston Electric Company; Albert H. Warren, manager Galveston Electric Company; Secretary Cooper; D. A. Hegarty, president Texas Southern Electric Company; C. H. Beck, Westinghouse Traction Brake Company, and Mr. Jacoby, salesman Westinghouse Electric & Manufacturing Company.

Mr. Berry emphasized the necessity for proper and adequate shop equipment as a means of reducing the cost of maintenance. Mr. Wood brought out the necessity of thorough and periodical inspection of cars. A discussion followed as to the length of this period, from which it was decided that the time limit depended upon the class of equipment and local operating conditions, and would vary for different locations. Mr. Wood has adopted 1000 car-miles as the time for thorough overhauling and examination.

The third paper of the session was on "Practicability of One-Man Cars and Their Operation," by D. R. Locher, second vice-president and general manager Corpus Christi Railway & Light Company. This paper was printed last week, and was discussed by W. W. Holden, superintendent of transportation San Antonio Traction Company; J. C. Thirlwall, General Electric Company; V. W. Berry, general superintendent Northern Texas Traction Company; P. W. Gerhardt, superintendent of transportation Dallas Consolidated Electric Street Railway; G. H. Clifford, first vice-president Northern Texas Traction Company; H. S. Mann, Goldschmidt Thermit Company, Chicago, and F. C. Webb, salesman The Rail Joint Company.

Mr. Holden suggested that the additional time necessary for a stop with a one-man car, due to issuance of transfers, making change, etc., was a strong point against their use. Mr. Thirlwall quoted facts based on the use of one-man cars by the Federal Light & Traction Company, which would seem to prove that very little extra time is consumed in this way, and that the same schedules can be maintained. Mr. Hegarty described some of the features of the Birney car and the Haller car, and explained that in the latest types, if anything happens to the motorman so that his hand is removed from the controller, the brakes are set and the

emergency doors are opened. Every operation, such as the opening and closing of doors, ringing of gongs, etc., can be conducted by the motorman without a change in position, so that the minimum amount of time is consumed in these operations and the maximum safety is attained.

It was brought out in the discussion that on certain lines where one-man cars have been placed in service they met with opposition from the men at first, but in all these cases the men would not now return to two-man operation. The one-man car also constitutes the best means of combatting the jitney, as it permits twice as many cars with the same number of men. The Northern Texas Traction Company of Fort Worth has ordered ten new one-man cars. It was also suggested that the name, "one-man" car, seems to produce a bad effect upon the general public by leading them to believe that men are being thrown out of work and that the safety to patrons is being decreased by one-half. Inasmuch as the safety of operation is actually increased, the suggestion was made that such cars in future be referred to as "front entrance" or "safety" cars.

The first paper of the second railway session held on Thursday afternoon, was "Scientific Selection of Employees," by P. W. Gerhardt, superintendent of transportation Dallas Consolidated Electric Street Railway. This paper was published in abstract last week. The discussion on it was opened by Dan G. Fisher, traffic manager Southern Traction Company, and others who spoke were G. H. Clifford, vice-president; V. W. Berry, general superintendent, and A. M. Watson, claim agent Northern Texas Traction Company; Rex Frasier, general passenger agent Galveston-Houston Electric Company; L. L. Stephenson, president and manager Yoakum Power, Light & Water Company; R. J. Irvine, vice-president and general manager San Angelo Water, Light & Power Company; W. W. Holden, superintendent of transportation San Antonio Traction Company; W. E. Wood, superintendent of transportation Houston Electric Company, and D. R. Locher, vice-president and general manager Corpus Christi Railway & Light Company.

Mr. Gerhardt maintained that education past the seventh grade in school was of no particular advantage in the making of a good motorman or conductor. He admitted that the main weakness of the system described by him at the present time was the lack of a thorough medical examination, and said that he was in favor of such an examination. Mr. Berry said that nearly 50 per cent of the men accepted on other tests in the Northern Texas Traction Company were turned down on their medical examination. Mr. Gerhardt went on to explain that the tests outlined in his paper were merely supplementary, and that little more than 20 per cent of the applicants reached these tests, as they were first rigidly examined as to morals, etc. Inquiries are also made into an applicant's past record, and his honesty often asserts itself in the manner in which he takes his examination. If a man accepts his examination with resentment he is dropped at once, and if he accepts with an amused tolerance he is quickly taught that it is no joke. To be a platform man is serious business. Mr. Wood said that the man who did the hiring should be a good judge of men.

A paper on coasting recorders was then read by R. E. Griffiths, assistant superintendent Northern Texas Traction Company. This paper was published in abstract last week. It was discussed by W. E. Wood, Houston; W. W. Holden, San Antonio; P. W. Gerhardt, Dallas; V. W. Berry, Fort Worth, and J. C. Thirlwall, Schenectady.

Mr. Wood said that the Houston Electric Company

will equip all its cars with recorders, but felt that we should never forget that safety should come first and coasting second. Mr. Berry replied that the experience of the Northern Texas Traction Company had indicated that coasting was a means of obtaining safety first, rather than placing it second. Not a single accident on this line could be attributed to coasting, but the damage in such few accidents as had been had was greatly lessened by the fact that the motorman was coasting. Mr. Berry further said that the subject of coasting recorders had been very thoroughly covered in recent issues of the *ELECTRIC RAILWAY JOURNAL*. "Good coasters," he added, "will operate a car in exactly the manner in which the equipment was designed to be operated." His company had made a saving of \$2,000 per month due to coasting recorders, and is well pleased with their use. Mr. Holden brought out the point that jitneys greatly interfere with the making of good coasting records.

The final paper of the railway sessions, "Methods of Attracting and Developing Interurban Traffic," was prepared and delivered by J. P. Griffin, general passenger agent Texas Traction Company, but because of the lateness of the hour the discussion was brief. This paper is printed elsewhere in this issue. Those who participated were G. H. Clifford, Rex Frasier and David Daly, president of the association.

OTHER BUSINESS

The electric light and power sessions were held on Thursday afternoon and Friday morning, and were devoted to papers of interest to operators of electric light and power companies.

The claim agents' session, which was to have been held concurrently with the Wednesday afternoon session, was postponed until Thursday afternoon because of delay in the arrival of the participants. This session was well attended, and papers of interest were brought up and discussed.

The gas men held no formal sessions, but talked over matters of interest to themselves.

As some members of the association, whose presence was essential at the business session scheduled for Saturday morning, found it necessary to leave on Friday night, the general session of Friday afternoon and the business session were combined and held on Friday afternoon.

Reports of the various committees were read and received. The resolutions committee reported among other things:

"That the thanks of the association be gratefully tendered to the technical journals of the United States for their uniform courtesy toward the association and liberality with which they have given space in matters pertaining to the association. We especially desire to thank the McGraw Publishing Company for copies of the current issues of its magazines, which it sent to this convention and which have been liberally used and appreciated by the delegates."

The officers elected for the coming year were: F. R. Slater, Dallas, president; H. C. Morris, Dallas, first vice-president; D. A. Hegarty, Houston, second vice-president; W. A. Sullivan, Shreveport, La., third vice-president; H. S. Cooper, Dallas, secretary; J. B. Walker, Dallas, treasurer.

The executive committee elected consisted of the president and vice-presidents mentioned above, David Daly, the retiring president, and for the two-year term, G. H. Clifford, Fort Worth; W. B. Tuttle, San Antonio; F. J. Storm, Amarillo, and W. B. Head, Dallas, and for the one-year term, R. Meriwether, Dallas; J. C. Kennedy, Brenham; E. S. Fletcher, Dallas; D. R. Locher,

Corpus Christi, and W. S. Rathell, Houston, honorary member. An advisory committee of twenty-five members and a finance committee of four members were also elected.

On Friday evening a boat ride around Galveston harbor was tendered to all the delegates by the Galveston Commercial Association. It was enjoyed greatly by all. The final event of the convention program was a rejuvenation and joviation on Friday night, tendered to all visiting Jovians by the Galveston Jovian League. It comprised a one-act comedy good-naturedly "roasting" some of the more prominent members of the association, a banquet, and the initiation of seventeen new men.

President's Address at Southwestern Convention

BY DAVID DALY

Local Manager Houston (Tex.) Electric Company

The experience of the street railways with the jitney has brought out very plainly the misunderstanding by the general public of the business of public utilities and the conditions under which they operate. To the public there seems to be nothing illogical in the view that the street railways have hitherto had their opportunity, and that now they must live or go under in competition with the new automobile transportation.

This might be a reasonable view if street railways ever had had the possibility of great profit or the right to earn all they could, or if the business was one that could be closed out and the capital withdrawn. It has, however, been recognized from the first that the business cannot be relinquished—that it is subject to the regulation and control of the public, and at no time is entitled to more than a fair and reasonable return on the money that has been invested.

As an effect to these limitations, street railways have been supposed to have security, and in place of quick and large profits gained something of the permanency and stability of the city itself. There is a strange short-sightedness in the view of a large part of the public. Temporary advantage looms large to us all as individuals. The treatment of public service problems, however, has to do with a community life, and requires a broader and more far-sighted vision than that which may serve in the brief span of our personal activities.

Nothing costs a community less to give, nothing is so conducive to its solid and substantial upbuilding as security to the capital that is devoted to its needs and service. Nothing more readily attracts capital to these services than assurance that this capital is safe, and nothing else makes it content with small returns. Yet what do we see constantly? Every safeguard that can be taken from this capital is considered a victory for the public. Every burden that can be put upon it is a political asset for the man that places the burden. Yet every burden and every element of insecurity must eventually be paid for by the community by the withholding of investment for this public service and by the higher rate of return necessary to attract the capital.

We have long been accustomed to this tendency to load the public service corporation with menaces to its security, but we are beginning now to face a still more serious situation that all of us having such properties in charge must recognize. The end of a franchise period is a time when a continuance of the right to life is decided. We have been lulled into a rather careless feeling about this date because we have been constantly assured by the public that public service must go on in any event, and that the end of a franchise period means only a review of the situation, a determination of the

amount of property devoted to the public service and a readjustment of the terms on which the corporation shall go forward in the next stage of its life. But we should not be blind to the danger in such a situation. We have property that is of value only in its present place and doing its present service. There is no more inviting target for the ambitious politician or the demagogic paper.

The value of public service property is in the income it produces. To the extent that this income is cut down the value disappears. We may as well have taken from us a part of our power house or a part of our rails as to be so deprived of a part of our proper and reasonable income. And what is our proper and reasonable income? It is the minimum percentage or rate that will induce investors to devote capital to this kind of service with such degree of security as it offers. No public would stand for a bald proposal that nearly half a corporation's property be confiscated, but a public can be wooed to believe that clippings from income, at one end and at the other, are justifiable.

These statements may appear exaggerated, but we have only to study what has been done in Cleveland and what has been attempted in Dallas to be convinced of the serious problems we have to face. Our position is not hopeless, but it requires our serious attention, because we must combat the fallacious arguments and make our public see the problem in its true light. Fortunately the Cleveland franchise itself and the proposed Dallas franchise, based on the Cleveland franchise, furnish a convincing reply to the fallacy that a depreciated value is a proper capital base on which to figure returns.

In Cleveland, for instance, upon the granting of the franchise, the property was depreciated to from 70 per cent to 75 per cent of its full value as measured by cost of reproduction to arrive at a capital base on which to figure returns. All new property to be added in the future is to be added to the capital base at its full cost. Provision is made in the franchise for repairs and depreciation, the theory of the franchise being that the capital base shall always represent the value of the property. The allowance for repairs and depreciation may be decreased if the condition of the property is such that the depreciated value of the property plus any reserve for depreciation is as much as 70 per cent of the cost of reproduction new. The latter provision is, of course, a plain recognition that property cannot always be absolutely new and that it is a burden on consumers to maintain a reserve that would always put the property in this useless and impossible condition.

The inconsistency should, however, be noted. The property in Cleveland that was in existence when the new franchise was imposed reached the standard of condition set for the future, yet this capital already invested was depreciated so that the income of the holders was only about three-quarters of what it would have been had it been invested later and the condition of the property been exactly the same. The property in existence when the franchise went into effect was allowed a capital base of but 70 per cent to 75 per cent of the reproductive cost because its condition measured by age was but 70 per cent to 75 per cent of new. The property that came into existence after the franchise went into effect was allowed a capital base of 100 per cent, even when its condition measured by age should be but 70 per cent of new. Why the discrimination? There was no reason whatever except that the early capital was already caught and the new capital was yet to be caught.

It is a bit discouraging that the public will tolerate this sort of thing, that the prejudice that has been created against corporations will blind the individual to

treatment that he would not countenance in his personal dealings with anyone.

We must realize, however, that we have this prejudice to deal with, and we cannot rest our case with the public with a serene confidence that palpable truths need no presentation. It is necessary that we all be familiar with the schemes that will be proposed sooner or later, as surely as we have franchises and rights maturing, and we should none of use be caught by unpreparedness to meet the statements and arguments that will be advanced.

Economical Maintenance of City and Interurban Cars

BY F. J. BENNETT

Master Mechanic Houston Electric Company, Houston, Tex.

Economical maintenance of street and interurban railway cars can only be determined by observation and comparison. Yet comparisons of the practice of companies, operating under practically the same conditions, are often misleading and not analogous on account of local conditions.

Nearly all small roads and some larger ones have made shop equipment and facilities a secondary consideration, with the result that repairs have become expensive propositions. They have not added new shop equipment or replaced old machines from time to time, and this condition of inefficiency has been allowed to continue until everything in the shop is obsolete with relation to the work it is expected to do. In the addition of new machinery the fact is often overlooked that it is more economical in the long run to install a thoroughly modern machine of proper capacity with individual electric drive and with proper tools than to install a belt-driven machine to fit the old tools. This tends to keep the shop equipment out of date and fails to conform it to safety-first ideas.

The methods of doing work in some shops are as ridiculous as going bear hunting with only fists as weapons.

By way of illustration of crude methods, I might add that at one time I was connected with a street railway whose employees in the maintenance department consisted of two engineers, two firemen, two day shop men, one night shop man and one track man. The shop tools and appliances consisted of a half dozen solid open-end wrenches, a track jack, a blow torch, two ladles, a rope and windlass, two saw horses and a work bench with a carpenter's vise. A forge in a neighboring blacksmith shop was also utilized. Armatures were raised and lowered by a rope looped through the trapdoor in the floor of the car and attached to a windlass. Changing a pair of wheels generally took two days. Split gears were changed without removing the motors, trucks or car bodies. The chief engineer wound the armatures, the shop foreman washed out a boiler every Sunday night, and the track man oiled the curves. General overhauling or painting of cars was not thought of. On top of all this handicap the shaky cars, which were run around curves and down grades at from 40 to 50 m.p.h., were equipped with cast-iron wheels and hand brakes.

There are a number of kinks around the shop which tend to reduce the cost and time of certain operations. For instance, instead of soldering the leads into the commutator segments, our practice is to drive leads into the slots and put above the top lead a short piece of wire of the same size and equal in length to the commutator bar, and then to drive this piece in solidly over the lead. Again, noisy gears are poor advertising, and it is very essential to quiet operation to have the gears and pinions always turning in the same direction as

when first installed. With sufficient grease they will wear to the breaking point before becoming noisy. Vibration caused by the gears is very detrimental to the armature windings and bearings, particularly where they have seen considerable service before this vibration takes place. The noise is generally noticed by the public, and word of it reaches the mechanical department by the way of the manager's office with the query, "Why?"

The scrap limit of interurban wheels is a serious problem, and if a road has both city and interurban cars it is practicable to turn down these scrap wheels for city use. Results show that small wheels are more satisfactory for city service than the standard 33-in. wheels, and on most equipment throughout the country 33-in. wheels could be replaced with 30-in. wheels without making many expensive changes in trucks or brake rigging. About the only prohibitive feature in this change is the clearance under the motor and gear case. Where permissible it lowers steps, increases acceleration and reduces current consumption. Whenever steel wheels are turned down, we make the pitch of the tread 1 in. in 20 instead of 1 in. in 25 as formerly, believing that this helps to keep the flanges away from the rail. The saving in flange wear is very perceptible.

Close watch of interurban wheels is very essential to insure safety in high-speed operation and requires the frequent gaging of flanges. The condition of one wheel hugging the rail at the expense of the flange can be remedied by new journal brasses, which will properly line up and center the wheels in the truck. Many wheels are started off wrong by using one old and one new journal brass on the same axle. The brakeshoe pressure and one-way operation tend to wear the brasses away from the center or toward the side of the journal box. Flanges can be reclaimed to some extent by moving the journal box forward from the center on the thin flange side, or back from the center on the thick flange side. This tends to keep the thin flange away from the rail and the thick flange close to the rail. It is only practicable on single-end equipment, and where the design of the truck is such as to allow a special pedestal to be used that will permit a filler plate varying in thickness from $\frac{1}{8}$ in. to $\frac{3}{8}$ in. to be inserted on the opposite side of the journal box.

Before leaving the subject of bearings it should be stated that when new or reabbitted bearings are bored out accurately to fit the shaft, the job is only half completed, as the bearing shell should fit the housing snugly. Loose shells in bearing housings are as bad as bearings loose on the shaft, and when wear has become so great that shimming is necessary, it is better policy either to plane off the bearing cap so as to render shims unnecessary or else to rebore the entire box and use bearing shells of larger outside diameter. Cleanliness is essential to good maintenance, for unless work is put together clean and free from grit and dirt, good fits and long life of bearings will be sacrificed. The additional time required to clean shafts and bearings, oil wells and bearing housings before assembling is small. Systematic oiling is also of great importance. Armature bearings, motor axle bearings and journals on city cars are divided into classes for each type of bearing, and are arranged on a list for regular oiling, at intervals varying from four to twenty days, depending on the kind of bearing and service conditions. At intervals of six months, waste and oil are removed from all of the boxes, and hard or glazed and gummy pieces are removed. The waste is soaked in a vat for twenty-four hours, then drained on a board for forty-eight hours, after which it is again ready for use. The best wool waste obtainable will prove much cheaper when used as

above mentioned. No attempt is made to oil the bearings of city cars on a mileage basis. On interurban cars, however, they should be oiled as follows: Armature bearings, 1500 miles; motor axle bearings, 1500 miles, and journal bearings, 2000 miles.

In maintaining equipment the co-operation of the transportation department in reporting defects is very essential, and the more accurate the reports the more they will be appreciated by the mechanical department. All reports of defects noted by the transportation department should have immediate attention.

Regular inspection is also necessary. The more frequent the inspections the better is the opportunity to know the true condition of the equipment. Economical maintenance means attention to small things. It is doubtful if one will ever have to report a missing car wheel, but the loss of a cotter key, if passed unnoticed, might cost the company many dollars. Too much stress cannot be laid upon frequent inspection of car roofs, as one small leak in the roof may cause the loss of the whole head lining, or it may start the ribs and roof boards to rotting. Careful inspection of high-speed interurban equipment should be made at close intervals. Heavy inspection should occur at intervals of not to exceed twelve months. This should include a written report showing the condition of the working parts of the equipment, stating the condition found and the action taken or renewals and repairs made. A weekly fire inspection is also of great value.

Efficiency among the shop men is another factor which means much to economical maintenance. Employees should receive every opportunity to become proficient in their particular tasks. Blueprints and bulletins should be posted whenever necessary, for they not only prevent many errors and accidents, but promote interest and increase the amount of work turned out. Organization tends to enable the men to work collectively, especially in fire drill maneuvers, at the same time giving efficient protection.

For a record and check on the actual variation of costs of standard parts used, it is well to keep a monthly shop operation report which will show work accomplished, together with cost per 1000 car-miles of items, such as brakeshoes, trolley wheels, gears and pinions, wheels, lubrication, etc. This report is not only of great value to the man in charge, but assists in the preparation of special and annual reports. The men in the shops can be trained to turn in repair cards showing parts removed or repaired, and work done in each instance. As the train crews sign their register cards they can check on the trouble card the items giving trouble during the day. This saves much time at night when the regular inspections are made.

The anticipation of the needs for supplies, especially on properties that are located far from the manufacturers, requires some diligent and persistent attention. Delay in securing some small article necessary for repairs will often cost many times the real value of the article. All brake levers, rods and beams should be equipped with standard hardened bushings before they are installed. If this is not done there is a chance for the holes to become changed in position from wear, which would change the ratio of brake leverage and make all parts non-interchangeable. It is much easier, more economical and safer to keep hardened bushings on hand and replace worn out ones than it is to plug up the old holes and drill new ones.

Too much care cannot be observed in the saving of scrap and worn-out parts. Employees in the shops should pick up all bits of brass and iron and put them in their respective bins. Worn-out trolley wheel parts, which often fall from the top of cars when repairs are

being made, should be saved. Burnt-out incandescent lamps, whether broken or not, should be returned to the storeroom for systematic salvaging. All old bolts should be put in a barrel, and when time permits the man in charge of the thread-cutting machine should be instructed to assort, cut off and rethread them. Jobs should never be termed completed until the removed parts, scrap, tools and unused stock have been picked up and restored to their respective places. Inspection of the scrap pile will often reveal the fact that material such as brakeshoes, gears or pinions have been removed and thrown out that have considerable life left in them, and gear cases that can easily be repaired have been discarded or turned over to the junk dealer. This applies to brass bearings and castings as well, and especially to motor axle bearings, where the top half of the bearings do in some cases wear out completely and the bottom halves still retain their original tool marks. It often pays in such instances to match up two bottom halves, using one for the top bearing, after cutting oil hole and groove.

One of the most important items that the mechanical department has to contend for is the systematic overhauling and painting of cars. In some climates cars do better than in others, but here in the Southwest, where there is so much dampness, cars rust and mildew quickly. This leads to rusted iron and rotted parts, and the only safe method of saving the cars from such excessive depreciation is to pass them through the repair and paint shop on a systematic schedule. The schedule will range from nine to twelve months, depending on the rate of deterioration of varnish and paint. It is far more economical to varnish cars at periods of from nine to twelve months than to let them go for a much longer period, when they will most probably have to be burned off to the wood, necessitating extensive wood and iron repairs.

In conclusion, the question of economical maintenance of cars, whether city or interurban, depends on the frequency and accuracy of inspection, the prompt action taken regarding broken or wearing parts, and close co-operation between the transportation and mechanical departments. Equipment cannot be watched too closely, and economy must never take the place of, nor militate against, the factor of safety.

Developing Interurban Traffic

BY JAMES P. GRIFFIN

General Passenger Agent Southern Traction Company and Texas Traction Company

The passenger business of an interurban railway in this section of the country is its chief source of revenue. Hence, it is necessary to have a passenger department, which is the sales organization, to look after the details of solicitation, sale of tickets, etc., and this department should be live and up to date, ready to take advantage of every opportunity to develop and increase its business.

The organization of the passenger department consists of the general office and the traveling and agency units, the relations of which must be most cordial.

The local agent is the prime factor in the securing of passenger business. He is the man directly "on the firing line," and he, in conjunction with the trainman, can do more to mold favorable public sentiment toward an interurban line than anyone else. It is essential that the agent be a good, clean man, and one who commands respect in his town, for thereby he can be of material assistance in securing and developing business. Almost anyone can sell tickets to those who come to the window and call for such and such a ticket, but it takes art

to sell round-trip tickets, through interline tickets, coupon tickets, etc. Courtesy is a valuable asset possessed by the good agent. The true value of the agent shows in his solicitation work. The live man knows in advance of probable movements and gets in touch with the people and increases the number to move. He should be possessed of the ability to go out and talk to his people and encourage them to make trips. Valuable work can be done by the agent through membership in the local commercial organizations. Friendships formed there with the men who are doing things in his town are lasting and bound to be beneficial.

Care should be taken by the general office to give proper credit to the agent for the work he does and encourage him in every way possible. A kind word spoken at the right time and a pat on the back in recognition of meritorious work yield rich dividends of loyal service. At the close of each week we have our agents forward to the general office reports of business solicited, secured and handled during the week, with comments upon business, crop and weather conditions, etc., and information as to prospective business. This tends to keep them interested in making a showing in their work, and anxious to do something each week, so that their reports will not be barren.

Along the line of keeping agents encouraged and interested, we have in effect on our system an "honor roll" plan, which is creating quite a lot of friendly rivalry among our agents. Under this plan, at the close of each month a statement is sent to the agents on each division showing their standing for the month as compared with the corresponding month of the previous year. This is figured in percentage gain or loss, so that the smaller stations are on the same basis as the larger ones. At the end of each six-month period three prizes in gold are distributed on each division, going to the agents making the first, second and third best showings for the period. We have found that agents take quite a little interest in this plan. They watch their business closer, know each day how they stand with the corresponding period of the previous year and are always striving to make a better showing. We have found from actual experience an increase in ticket sales, as the agent rarely ever lets a patron get away from his station without selling him a ticket. Often he sells round-trip tickets to those who have called for one-way and through interline tickets to those who had intended to buy only to the junction point and rebuy there, thereby insuring a return trip or a through trip via the interurban route. It has materially increased the sale of our cash coupon tickets, which contain \$10 in transportation and sell for \$8. This particular ticket has been strongly pushed by our agents. I recall the instance of an agent in one of our towns having a population of about 8000, who, during the last two days of the year 1915, went out into his town with a supply of these tickets in his pocket, and on the streets and in the stores and offices sold some sixty of them. He materially increased his standing on the "honor roll" by doing so.

At the close of the year we send to the agents a statement showing the total ticket sales at all stations for the year. This statement is arranged by divisions. The information appears to be very much appreciated by the agents and in many instances has given them a mark to shoot at. Naturally each agent has in mind some other station which he thinks he should beat in his receipts. If he falls down one year he strives harder during the following year. On the other hand, the other agent works to keep ahead.

Agents should be kept advised of coming events. It is our policy to send out several times each year a

"Prospective Business Circular," giving advance information as to dates of conventions, meetings, fairs, baseball and football games, theatrical attractions, etc., to be held and to appear in our territory within the near future. At the close of each week there is mailed to the agents a "Passenger Department Weekly Schedule" giving a list of known events for the coming week. From time to time other information in various forms is sent to the agents. Complete files of the circular instructions and information of the passenger department should be furnished to agents to enable them to quote rates and arrangements for service intelligently.

The general passenger agent should call upon his agents as often as possible and discuss with them matters of solicitation, station work and business in general. By having at his finger tips information as to the results the particular agent is obtaining in his work, he is better fitted to talk to him about his condition. He should encourage the agent to give his ideas and talk freely about things as the agent sees them.

The traveling man of the passenger department should also call upon the agents often, once a week if possible. He is the "big brother" of the agent, and coming to him in the spirit of friendship and co-operation, mutual assistance can be rendered. Much of the groundwork of solicitation must be done by the agent, and then when the traveling man comes in, matters can often be brought to a final and successful conclusion.

The traveling passenger agent should be mobile and versatile. He should class "A-1" as a mixer. His field for solicitation and development is broad, its limits being almost boundless. It extends not only immediately along the line in his division but far into adjacent and surrounding territory, particularly around the terminal and junction points where connections are made with steam railroads. On these trips he should call upon the newspaper men, hotel men, principal business men, steam railroad agents, etc., everywhere preaching his doctrine of interurban service and rates. He should carry with him and distribute advertising matter, such as novelties, pencils, placards, time cards, etc. His outfit is not complete without hammer and tacks, and he should leave his tracks on the walls and fences of the towns he visits. When he comes into a town the first man he should see is the local agent. In consultation with the agent his moves are planned.

The traveling passenger agent should keep in close touch with the heads of the schools and colleges in his territory, and their athletic departments, also with the heads of fraternal orders, baseball and football organizations, etc.; in fact, every class of business that is likely to move frequently. He should accompany as many as possible of the special movements in his territory. This courtesy is appreciated by the parties, and by having a direct representative on hand, difficulties and misunderstandings may be avoided. He should report to the general office at the close of each week, showing the territory visited by him, business solicited and secured, etc.; also information picked up as to prospective business. He naturally is in close direct touch with the general office, from which he receives from time to time information as to possible movements in his territory.

The general office concerns itself with the supervision of the whole work, the keeping track of the details, etc. Here the work must be planned, mapped out, assigned and watched. The general office must be in close touch at all times with the agents and the traveling representatives. It puts out information to them and calls upon them for information and their reports. It lines up with the operating department the movement of special parties and extra business and assigns the

proper one to accompany such movements. It lives in to-day and to-morrow, and not in yesterday.

Careful attention should be given by the general office to its correspondence. Inquiries should be promptly and carefully answered. An inquiry for service from some one in the immediate territory of the line should be answered in person by some one in the passenger department. The general office should from time to time put out tactful letters soliciting business. There are many places where such letters can be sent and secure good results.

Receipts can be increased from business developed to see the attractions at the theaters in the larger towns. It is our policy each week during the theatrical season to send to the agents circulars giving full information as to the theatrical attractions for the coming week. Posters advertising the attractions are often furnished by the theaters, and we display them in our stations and about our towns. Often dash signs are carried on the cars. The effort is made to make the interurban station headquarters for theatrical information. We have arrangements whereby we can reserve seats at the theaters for our patrons; the patron calls upon the agent in his town and indicates what seat he desires, the agent phones the general office, which in turn makes the reservation at the theater, information as to the location of the seats being passed back to the patron through the agent. The tickets are laid aside in the box office at the theater, and are called for and paid for by the patron when he reaches the theater. Hundreds of seat reservations are made through our organization each season. During the ten days of the return engagement of "The Birth of a Nation," at the Dallas Opera House, in February of this year, our office reserved over 800 seats, the agents reporting that more than 1500 people attended from points on our system. Several special parties were worked up. A great deal of this business was secured through the earnest efforts of the agents and the traveling representatives. This is only one instance of many. Other attractions have also been helped in the same way.

The securing of business through the means of what are called "prepaid orders" brings in quite a little revenue. Under this plan a patron is enabled to make deposit with one agent and have a ticket furnished at another station. This plan is used quite frequently by baseball and football teams, where their expenses are guaranteed and tickets furnished by the other team. The order is placed over the company phone and quite often the person to whom the ticket is to be furnished is waiting in the station when the order is received. The convenience of the plan means much to the patron, and avoids the sending of the money direct by mail, which in some cases might be diverted to other directions than the purchase of the interurban ticket.

Business developed for parks, while not particularly remunerative, still has a splendid advertising value. This business moves generally during the spring for school and church picnics, etc., and on Sundays and holidays during the spring and summer, when people want to get out into the open. Much revenue can be secured from small special movements, such as baseball and football clubs, conventions, etc. These movements should be looked for in advance, solicited and secured, and carefully watched to see that the service is adequate. Attention should be paid to athletics in colleges and high schools. The friendship of these boys can be easily secured, and then good service does the rest. No movement should be too small for the watchful eye of the good passenger man.

Where interurban lines connect and through tickets are for sale, joint solicitation should be done by the

different passenger organizations. When advertising one's system, good words can be thrown in for the connection.

Special rates should not be encouraged where there is not a volume of business and unless they will materially increase this business. As a rule reduced rates on Sundays increase traffic from nearby points into the larger cities, and reduced rates for parties of ten or twelve or more tend to increase travel, particularly for special events where several people want to go and will induce others to make up the necessary number to secure the party rate. Special rates, at times, for conventions, meetings, etc., are necessary. They can be controlled quite well by making the rates good going only for one or two trains, thereby localizing the movement, and good returning on all trains within a specified limit. Special rates are also necessary during the periods of fairs, stock shows, etc. When carefully advertised they should increase the volume of business and the total receipts.

The daily and weekly newspapers undoubtedly offer the best general mediums for the advertising of interurban service. A number of subjects can be discussed in newspaper advertising—general thoughts as to service, convenience, comfort, rates, information as to attractions, etc. Much of our advertising space is secured in exchange for transportation.

Splendid advertising results can be obtained from the use of novelties specially suited for this work. Distribution is the chief drawback to novelty advertising, and unless one has a means of placing these novelties in the hands of those with whom they will do good, they should not be used. We have obtained good results from the use of notebooks, screw pencils and ordinary lead pencils. We have also used some change trays, desk brushes and paper weights with fairly good success. It has been our policy to distribute these novelties largely through our traveling representatives, placing them with newspaper men, hotel men, drummers, railroad agents, etc. Most of these novelties have been distributed in the territory off our line, the thought being to keep a more or less permanent advertisement with these people.

Flyers advertising reduced rates for special events are a standard form of advertising and one from which good results can be obtained. Distribution can be obtained through the assistance of agents. The best plan is to tie the flyers into bundles of about twenty before leaving the general office, nothing remaining for the agent to do but to place them about his town at the proper times.

A splendid solicitation medium is the timetable folder. This should be as simple as possible. Agents should have on hand for distribution a supply of these folders at all times, and they should be conveniently placed at the ticket windows so that patrons can easily obtain them. It is our practice every few months to mail our time cards to a selected list of hotels and steam railroad agents in our contributory territory in Texas and Oklahoma.

Blotters, placards and posters serve a good purpose in advertising. If you buy a blotter, buy a good one, one that when placed on a desk will be used and not thrown into the waste basket. Hotels in our towns call upon us from time to time for blotters for their writing desks and rooms. Blotters placed in public places, such as banks, postoffices, courthouses, etc., add to the well-balanced advertising plan of an interurban line. Placards and posters can be well displayed in the business houses and on the walls and fences about the towns.

Billboards, fences of baseball parks, etc., offer a

means of getting the claims for interurban service before a large number of people.

Selling interurban transportation is like selling goods; it is easier to sell transportation with good service than with poor. The operating man naturally has troubles of his own, but he should remember that the passenger man is not immune. The brunt of the complaints falls upon the passenger department. When the passenger man is backed up with good service he can go to his work with a smile on his face and with words that carry conviction, for he knows that what he is offering is good.

The passenger department should periodically check up the train sheets and traffic charts to ascertain real traffic conditions, finding out if trains are running on schedule or late, and whether or not overloaded. While primarily it is the duty of the passenger department to call for additional equipment for special occasions, special trips, etc., and it does not pay direct attention to equipment needs of regular service, still I know from personal experience that operating men appreciate suggestions looking to improved service. Much good can be done by the passenger man securing the good will and friendship of the trainmen, from whom he can often receive valuable ideas as to service.

The passenger man should cultivate the friendship of steam railroad officials and agents. Many passengers come to the interurban upon recommendation from some steam road agent who has been the recipient of a courteous call or favor from an interurban man.

Street Railway Paving

BY W. M. ARCHIBALD

Engineer of Way Houston (Tex.) Electric Company

There are three essentials in a satisfactory paving for street railway work: wearing qualities, smoothness, and ability to withstand rail vibrations. The third quality is better explained by the somewhat slangy phrase, "tendency to stay put."

Ten years ago the wearing quality was considered of the utmost importance both by the public and street railway officials, but now, due to the change in street vehicular traffic, smoothness is the quality demanded by the public, and to this demand street railway officials are obliged to accede. Ten years ago street paving was worn more by wheel traffic or street vehicles than anything else, but under present roadway traffic conditions the failure of paving is due to other causes.

There is no type of paving yet developed which fulfills the three requirements mentioned. Granite-block paving fulfills the first and the third, and, from a strictly street railway standpoint, is undoubtedly the most economical type of paving, but it does not meet the public demand in regard to smoothness. Wood block, when laid properly as to drainage and traffic, fulfills the first two requirements, but except under certain conditions which are now well recognized, it is almost impossible to keep the paving where it belongs. Brick pavement is, I believe, the best all-around paving material for general street railway work, except under conditions of exceedingly heavy traffic. It has good wearing qualities; when properly laid and maintained it is reasonably smooth, and, under usual conditions, it will withstand the vibrations of the rail against which it abuts.

The several forms of bituminous sheet pavement fulfill only the second qualification. They do not wear well under heavy traffic and, when butted against a rail, the vibration of the latter is almost certain to cause particles of earth and other foreign matter to work down under the pavement sheet and cause it to curl. These

pavements are smooth, however, and popular with automobilists, the general public and city officials.

A paving material to withstand rail vibration must do so of its own dead weight. To accomplish this the wearing surface and the paving base must be as nearly monolithic as possible. A cushion under the paving wearing surface is under present conditions unnecessary. The more nearly the entire paving approaches the condition of a solid block, the better will it wear and the less maintenance work will be necessary on it.

Brick pavement, laid flat with the wear at right angles to the direction in which the clay is forced through the molds, and on a moist mixture of cement and sand sufficient to form a uniform and even bed for each brick, makes a solid block when the brick are grouted with cement. The thinner this bed of cement is laid the better, as its setting depends, to a very large extent, on the moisture which permeates the joints while the brickwork is being grouted. Unless considerable water gets down to this bed there is not enough water present for the chemical action accompanying the setting of hydraulic cement. In very dry weather it is advisable thoroughly to sprinkle the brick after ramming and before grouting, as this is beneficial to both the bed and the grout.

A pavement laid in this manner is durable if the bricks have been properly burnt and inspected for hardness. It is also a comparatively smooth pavement, as all joints and inequalities of brick are filled with cement grout when the same is brushed into it. Further, it is a pavement which will withstand considerable rail vibration as the wearing surface is cemented to the bed and the paving base.

Whenever the requirements are such that a sheet pavement of any of the various types must be laid between the rails, courses of brick or wood block should be laid alongside of the rails prior to the application of the sheet pavement. These blocks are subjected to unusual loads during the construction of the sheet paving, as the steam roller used in rolling the sheet pavement must necessarily go over the blocks. In most cases the blocks have been laid but a short time before the application of the roller, and usually the roller breaks the initial bond between the blocks and their bed. The blocks or brick should be laid on a stiff mortar and "shoved" into place and to grade in the same manner in which "shoved" joints are made on brick work. If conditions permit, they should be put in place at least two weeks before the application of the sheet pavement. Even then there will be many failures due to the action of the roller.

Scientific Selection of Employees

In the last issue of this paper an abstract was published of the paper on "Scientific Selection of Employees," by P. W. Gerhardt, superintendent of transportation Dallas Consolidated Electric Street Railway, read at the Galveston meeting of the Southwestern Electrical & Gas Association last week. In that paper Mr. Gerhardt referred to three tests given to prospective employees. These tests were termed, respectively, attention test, observation test and judgment test. The accompanying illustration shows the printed question blank used in the attention test.

In his account of this test, Mr. Gerhardt said that Questions 1 and 2 are in the way of catch questions and require the closest attention of the applicant. Questions 3, 4, 5 and 6 are arithmetical questions. The applicant is timed with a stop watch to determine how long he takes to answer these questions, and the number of

ATTENTION TEST

GENERAL DIRECTIONS:
 Do what the printed instructions tell you to do.
 Do not ask the examiner any questions about the examination.
 Do not ask any other person who is taking the examination any question or watch any one to see what he does.
 Work as rapidly as you can **WITHOUT MAKING ANY MISTAKES.**

1. Write your name and permanent address here.

.....

.....

2. Do what it says to do as quickly as you can, but be careful to notice just what it does say.
 With your pencil make a dot over any one of these letters, F G H I J, and a cross after the longest of these three words: **BOY, MOTHER, GIRL.** Then, if Christmas comes in March, make a cross right here but if not, pass along to the next question and tell where the sun rises. If you believe Edison discovered America, cross out what you just wrote, but if it was some one else, put in a number to complete this sentence: "A Horse has.....feet." Write **YES**, no matter whether China is in Africa or not..... and then give a wrong answer to this question: "How many days are there in a week?..... Write any letter except G in this space..... and then write **NO** if 2 times 5 are 10..... Now, if Tuesday comes after Monday, make two crosses here..... but if not, make a circle here..... or else a square here..... Be sure to make three crosses between these two names of boys: George.....Henry. Notice these two number, 3, 5. If iron is heavier than water, write the larger number here..... But if iron is lighter, write the smaller here..... Show by a cross when the nights are longer: In summer?..... in winter?..... Give the correct answer to this question: "Does water run uphill?..... and repeat your answer here..... Do nothing here (5 plus 7 equals..... unless you skipped the last question; but write the first letter of your first name and last letter of your last name at the ends of this line.....

3. Add the following as indicated:

53429	34321	76905	57333	52491	78845	10001	27345
19587	19355	19008	58888	55847	10002	99009	15493

4. Subtract the following as indicated:

98553	55321	98755	76543	79989	80001	90990	75598
89847	10657	58789	55539	78890	71000	10009	35873

5. Multiply the following as indicated:

38754	78592	98975	53002	41999	59117	41009	35873
5	3	17	5	8	9	4	5

6. Set down and add the following:
 Five hundred and fifty-three dollars and five cents.
 One hundred and ninety-nine dollars and four cents.
 Two thousand and three dollars.
 Two thousand seven hundred and forty dollars and ninety-one cents.

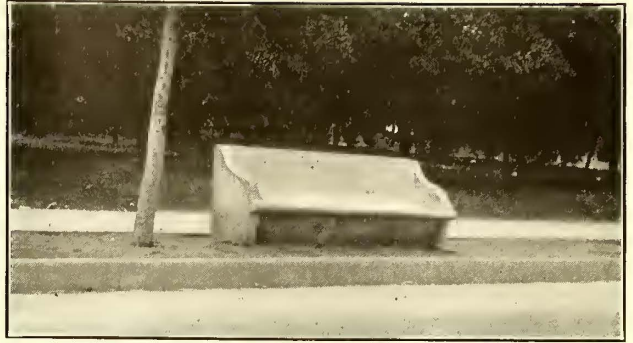
ATTENTION TEST BLANK USED IN SELECTION OF EMPLOYEES

omissions and errors are counted. He added: "This test is given but once, as its effectiveness depends wholly upon its novelty. The object of this test is to determine the applicant's ability to receive instructions and to do as he is told to do. How often do accidents occur due to the trainman's neglect or misunderstanding of a rule or bulletin? If by so simple a test we can decrease the chances of such accidents, is not the effort well worth while?"

Attractive Waiting Stations

Serviceable but Inexpensive Shelters and Resting Places for Patrons Have Been Erected by California Electric Railways

A LONG the electric roads of southern California, especially in the districts between cities, many small but artistic and serviceable waiting stations have recently made their appearance. Typical stations are shown in the accompanying illustrations. Although attractive, these stations are of a sufficiently inexpensive nature to permit the companies to erect them in



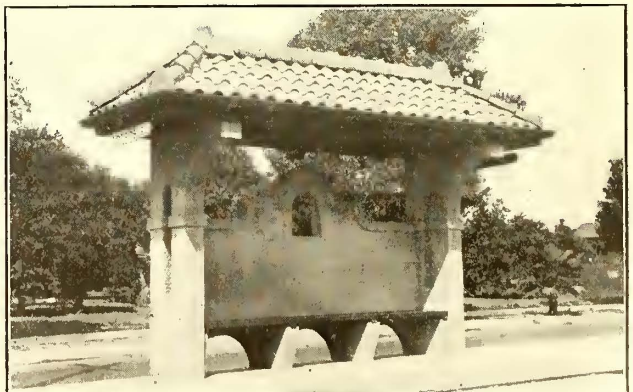
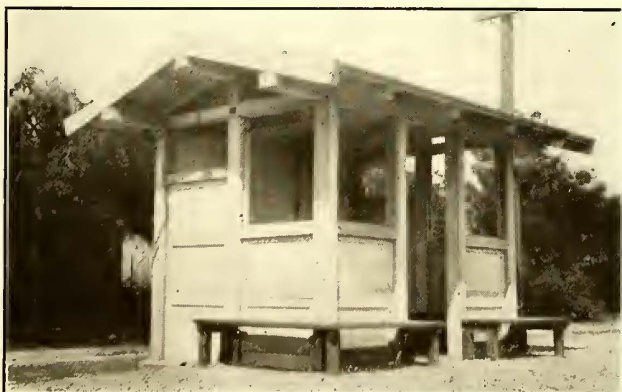
CONCRETE BENCH FOR NEAR-SIDE CROSSINGS

sparsely settled sections, as well as in those communities which are thickly built up. Generally all the stations situated between two large cities are constructed from the same general design and of the same materials, thus reducing the cost of erection and at the same time allowing the station to give to the stretch of road a certain individuality.

One of the illustrations shows an attractive open-air shelter finished in Spanish style. This structure is about 15 ft. long, and its open side is turned toward the tracks, from which it is removed a safe distance. The roof is covered with regular red Spanish tiling, which contrasts tastefully with the light exterior of the main section. The back, the ends and the chief braces are made solid of concrete, with an exterior finish of stucco. The seats consist of a 2-in. x 12-in. plank. About thirty of these stations are located between Los Angeles and Pasadena.

A serviceable bungalow type of waiting station also is shown. This has a semi-closed room, 8 ft. x 10 ft. The uprights for this station are 6-in. x 6-in. posts, between which concrete has been poured to form slabs. These slabs, which are 4 in. thick, have been given a panel effect. There are benches both inside and outside this station, which is sufficiently open for the comfort of those waiting for trains during summer, while at the same time it furnishes ample protection from the winter rain. The roof of this little structure is shingled.

A series of about thirty all-concrete benches, of the type shown in another illustration, have been erected along the line of the interurban railway entering Alhambra, which occupies the central strip of that city's leading thoroughfare. This series extends from city to city limit. The benches are located at both near sides of every crossing. They are about 10 ft. long, and are comfortably shaped. They are not polished. The end, back, seat and front are about 4 in. in thickness.



ATTRACTIVE SHELTER AND BUNGALOW TYPES OF WAITING STATIONS

N. E. L. A. Holds Annual Meeting

Association Considers Change in Name to Indicate Expanding Scope—Has Eye on Railway Power Business—At Three Profitable Technical Sessions Reports of Value to Railway Men Were Discussed

THE National Electric Light Association held its thirty-ninth convention this week in Chicago, the eighth in that city. The convention began with a reception on Monday evening, May 22, and the sessions were held from May 23 to May 26 inclusive. The headquarters were in the Auditorium Theater and the meetings were held in the Congress and Auditorium Hotels. The stage and orchestra of the theater were floored over to furnish space for exhibit booths, which also occupied the foyers.

In his presidential address delivered on Tuesday, E. W. Lloyd, Commonwealth Edison Company, Chicago, Ill., traced the progress of the industry in its several fields and in the stability of electrical securities. He outlined changes in the constitution and by-laws to provide for the welfare of geographical sections, and urged the change of name of the association to one more nearly indicative of the scope of its work, as was suggested by Frank J. Sprague.

Reporting for the public policy committee, he referred to the numerous meetings held during the year, and especially to the February and April conferences, called to discuss valuation, depreciation, federal legislation affecting water powers, and other important topics. As a result the appointment of a committee was recommended for the following purposes, to be made up of operators, engineers, accountants and lawyers, having experience in valuation work, to formulate a program for:

"(a) Establishing such relations with the valuation committee of the Interstate Commerce Commission as may be desirable properly to co-ordinate the valuation of other public utilities with that of steam railroads;

"(b) Agreeing as far as it may be possible to do so upon a terminology to be used in making appraisals of public utility properties;

"(c) Prescribing as far as may be possible to do so standard methods of appraisal;

"(d) Studying the records and decisions of adjudicated cases for the guidance of utilities in the preparation and presentation of future cases; and

"(e) Considering the desirability of joint consideration of the subjects embraced within this resolution with other public utility associations."

Abstracts of a number of the important reports affecting electric railways directly or indirectly are given in the following paragraphs.

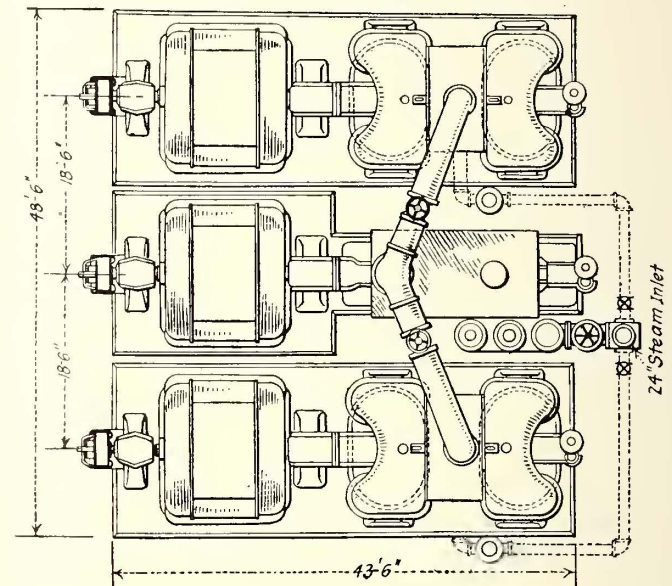
Prime Movers

The committee on prime movers presented a 179-page report divided into three sections respectively on steam power, water power and gas power, and several appendices. It contained general studies by the committee, articles by specialists in a number of fields, statements from manufacturers as to the developments in their respective fields, and a complete bibliography on the subject of prime movers for the year covered by the report.

In introducing the report the committee stated that in steam power the feature of the past year was the phenomenal increase in the size of steam turbines and

the large number of orders placed with manufacturers. Condenser development has kept pace with the turbines, and the size of the boiler unit is increasing. There is also agitation for a much higher steam pressure. In the field of internal combustion engines there is at present little or no activity in gas engine and gas producer work for power purposes, but the development of the heavy oil engine is very active. The power obtained from one cylinder in a heavy oil engine remains, however, comparatively small.

On the subject of Curtis steam turbines, the General Electric Company stated that in the larger sizes, the turbines under construction are designed to operate on steam pressures of from 200 to 300 lb. gage, and plans



THREE-UNIT, 60,000-KW. STEAM TURBINE FOR INTERBOROUGH RAPID TRANSIT COMPANY

are now being considered for turbines for approximately 500-lb. gage. There is on order a 60-cycle machine of a capacity of 50,000 kva.-amp. comprising a single turbine of single-flow design direct-connected to a single generator. Of forty-five turbines of 10,000-kw. capacity and over ordered during the past year, all are of the single-flow type, and practically all are designed for a 29-in. vacuum. The company has also built a large number of geared turbines for driving generators.

The Westinghouse Electric & Manufacturing Company stated that the turbine manufacturers, by dividing the units into two or more elements, can meet practically any requirement as the size of a complete unit. The arrangement may be a single cylinder and a single generator, a tandem turbine with a single generator, a two-cylinder cross-compound turbine with two generators, or a three-cylinder two-stage compound turbine with three generators. The last-named arrangement is shown in the accompanying illustration of the 60,000-kw. unit under construction for the Interborough Rapid Transit Company, New York City.

The first arrangement has been used in sizes up to

35,000 kw. It represents the lowest initial cost but not the highest efficiency. Turbines of the second type have been sold up to or slightly above 35,000 kw. Its highest efficiency point is at a larger load and somewhat higher than in the first type, and its range of efficiency is quite a little better. The limiting condition of this type is the generator. The cross-compound principle conduces to reliability and simplicity of operation, as well as to economy. Among other advantages of the three-element type are these: The low-pressure elements and their exhaust chambers are smaller; the inlet pressure to the low-pressure element is higher, permitting the use of smaller connecting pipes, and if one of the low-pressure cylinders is operated alone on high-pressure steam, the steam consumption will not be intolerable for an emergency condition of operation. With the three-cylinder scheme, the highest economies commensurate with the largest size of turbine are obtainable, and at the same time there is a degree of flexibility due to possible operation of the individual elements separately. The Westinghouse Company has also been successful with geared units, and reported satisfactory performance of a 1000-kw. unit placed in operation at the plant of the San Diego Electric Railway in 1911.

UP-TO-DATE INFORMATION ON CONDENSERS

The committee's report gave much attention to condensers, although test results of the recently installed large condensers were not available. However, the performance of these condensers was stated to be satisfactory. The Westinghouse Company stated that the preponderance of sales is in favor of surface condensers, but, as there are many places where the up-keep of these is prohibitive, many important sales of jet condensers are being made. A jet condenser for a 45,000-kw. turbine is on order. A year ago a jet condenser of this size would hardly have been considered feasible. This company mentions the "heat balance" condenser, a jet condenser driven by both a turbine and an electric motor. This was designed primarily for plants having a fluctuating load where a single turbine would, at light loads, supply an overabundance of heat for feed water. During such periods the electric motor comes into use, the steam turbine being used only when its exhaust steam is required for heating feed water. The Wheeler Condenser & Engineering Company described a similar arrangement.

The Wheeler Company stated that all plants are not selecting turbo air pumps for surface condensers, the dry vacuum pump being preferred in many cases. According to this company, there are two schools of auxiliary design; one embodying the high-speed, turbine-driven air and circulating pump, the other the reciprocating-type pump and low-speed circulating pump. The latter makes a complete, self-contained unit of low steam consumption and low speed. The Henry R. Worthington Company reported that the arrangement of condenser tubes providing special lanes has resulted in a fairly equal distribution of work in the different classes of its surface condensers, and an evenness of pressure that would have been considered impossible even two or three years ago. In fact, the total loss through the condenser from the vapor opening at the suction of the vacuum pump to the exhaust nozzle has been reduced to hundredths of an inch. The two-stage rotative dry vacuum pump has proved highly satisfactory due to the entire neutralization of clearance, the prevention of air leakage into the first stage, the confining of any re-expansion of vapors to the second stage, and the addition of a set of valves interposed between the condenser and the atmosphere. The company also reported the results of tests on the effect of

air leakage upon condenser efficiency, but did not discuss these. In addition, it brought out the fact that it is possible greatly to modify the condensate temperature by manipulation of the circulating water during the cold winter months. Actual tests have shown the possibility of varying this temperature through wide ranges with practically no variation in the vacuum carried. Pumping an excessive quantity of water, resulting in the additional cooling of the condensate, is accomplished at an excessive increase in power and auxiliary steam consumption. While it may be possible to utilize a part of the excess exhaust in heating the feed, it should be possible easily to maintain a condensate at a satisfactory temperature without the use of a heater, where the non-condensable vapors and the condensate are withdrawn separately from the condenser.

Regarding condenser tubes, the committee reported that, after correspondence with some twenty companies on this subject, it appeared that, of those purchasing tubes under specifications, the majority use a form based on the specification of the United States Navy. Of the remaining companies, the majority use "admiralty" mixture, a marked improvement being shown in some cases where a change has been made to this mixture. The Detroit Edison Company has found that for use with fresh water the following mixture has proved to have the longest life: Copper, 70 per cent; zinc, 30 per cent; tin, none; lead, under 0.01 per cent, iron under 0.075 per cent. The committee described the process for sand-blasting condenser tubes, and gave a drawing of the apparatus, which is very simple. A quart of sand can be driven through a tube in twenty seconds, and one operator can clean from 100 to 120 tubes per hour.

HIGHER BOILER PRESSURE COMING

The committee presented a resolution requesting that the A. S. M. E. take action on the rational rating of steam boilers. In introducing the subject of higher steam pressure for boilers, the committee presented a paper by Robert Cramer showing the possibilities of higher pressure. In commenting on the paper the committee drew attention to the fact that there are many practical features to be considered in the utilization of pressures in excess of present high-pressure practice, namely: Radical departure from standard boiler design, boiler losses resulting from higher flue temperatures; design of economizers to meet extreme pressure conditions; design and construction of pipe-line fittings and valves; finding suitable materials, not now known, for turbine blading to prevent erosion due to moisture contents in steam, and materially higher installation costs and the ever-present fixed charge on the investment.

In response to a query from the committee, the Babcock & Wilcox Company stated that gage pressures from 200 to 225 lb. at the boiler, with a superheat of 150 deg. Fahr. may be said to be average present practice in power station boiler plants. Recent developments in turbine and engine design make higher thermal and consequent over-all station efficiencies available by the use of higher pressures and degrees of superheat. The company has in course of construction a number of large boiler units for 350 lb. working pressure with 250 deg. superheat. Recent inquiries from customers regarding boilers for 500 to 600 lb. pressure with superheat up to 700 deg. Fahr. have prompted the making of a series of experiments which, while not yet completed, already demonstrate that if the demand for such a boiler is large enough, it can be manufactured and turned out as standard commercial apparatus. For 350 lb. working pressure the cost of the largest-sized units would probably be about 20 per cent more than

for boilers of present standards. The question seems to be whether 500 or 600 lb. pressure with a practical limit of 700 deg. Fahr. temperature will, as compared with 350 lb. working pressure and 700 deg. Fahr. temperature sufficiently increase over-all station efficiencies to compensate for the difficulties incident to the higher pressure. In assuming 700 deg. Fahr. as the practical limit of steam temperature, the problems to be solved are entirely outside of the boiler and furnace. The company states that Sargent & Lundy of Chicago, Ill., are building a station in Wheeling, W. Va., for 350 lb. pressure, using B. & W. boilers and General Electric turbines.

CLINKERING OF COAL FURNISHES LIVE PROBLEMS

Coming to the subject of fuels and furnaces, the committee first took up the subject of fuel oil, which was considered from the standpoint of continuity of supply, cost, and facility for storing. In the East, the only fuel oil available is Mexican oil, of which four barrels are equivalent to one ton of coal. At the present price of \$1 per barrel, oil cannot compete with coal. Moreover, the price of oil fluctuates widely and oil companies are not inclined to make a price which will hold long. The only safe way to store quantities of oil is in tanks underground, or largely so, and even then the fire hazard is considerable.

The next subject taken up was the clinkering of coal in its relation to stoking. J. P. Sparrow showed that coals having an ash fusion temperature above 2500 deg. Fahr. are practically free from clinker trouble. The critical clinkering point for the Taylor stoker lies between 2400 and 2500 deg. He stated that chain-grate stokers can burn, without serious clinker trouble, coal the ash of which fuses as low as 2000 deg. Fahr., and probably considerably lower. With underfeed and overfeed stokers and hand-fired grates the critical fusion temperature is about the same as that given above. Overfeed types of stokers, in which the incandescent fuel is in close contact with the grate bars, cannot successfully burn coals as high in pyrites as the underfeed stokers on account of the corrosive action of pyrites on the iron grate-bars. The committee then gave details of methods for sampling coal and for determining ash fusion temperatures, the latter subject being gone into in great detail.

STOKER MANUFACTURERS PROGRESSING WITH SELF-DUMPING FEATURE

In the matter of stokers, the committee presented reports from several stoker manufacturers. The Westinghouse Company stated that it had been found necessary to have three types of stokers; underfeed, Roney and chain grate, in order to fit all conditions. The Sanford-Riley Stoker Company, Ltd., reported that its self-dumping underfeed stoker has demonstrated the soundness of the principle of using moving retort sides. This feature was developed to slice the fuel bed and eliminate the possibility of fixed clinkers over the tuyeres. One of the chief aims in educating operators is to have them keep a comparatively dirty fire at the lower end of the stoker, the only troubles with ash plates having been due to carrying a green fire too far down in the stoker. This company finds a tendency in the direction of large stoker units, it having now in operation four stokers of sixteen retorts each. It is building ten stokers of fifteen retorts each to be installed under five boilers, making thirty retorts per furnace. The company's observations show that, so far as combustion efficiency is concerned, it is good practice to provide the greatest possible retort capacity. The combustion efficiency is inversely proportional to the speed of the fuel through the stoker.

The American Engineering Company reported improvements in the Taylor stoker dump plate. The company is now equipping the Taylor stoker with a power-operated dump grate, employing a steam cylinder for the purpose. A complete dump can be made with the power operated dump plate in from five to six seconds. The scheme for continuous ash disposal installed in the plant of the Detroit Edison Company is satisfactory, but it requires more space than is ordinarily found in power stations. It does not have the degree of flexibility desirable in power stations with widely fluctuating loads and high peaks, and it requires more time to start up a boiler from the unlighted condition, because the ash pocket must be filled with ashes before any considerable load can be put on the boiler.

FURNACE BRICK WORK FOR HIGH TEMPERATURES

The effects of the present higher temperatures on boiler brick work were discussed by the committee, and the means available for reducing damage were mentioned. The cooling of certain parts of the brick faces exposed to the fire is contrary to the basic principle of furnace efficiency and capacity, and has been generally discarded. A number of classes of firebrick have been developed, but experience has shown that fire-clay brick best fulfills the requirements of infusibility, absence of shrinking or deformation, strength, and resistance to vapor and slag penetration. The silica-alumina mixture is preferable to the silica-kaolin mixture. Firebrick must be of uniform size and true in shape so that perfect joints can be made, and a good quality of fire clay must be used in laying the brick. For side walls and other parts of the furnace where slag is most apt to collect, the brick must be sufficiently hard and strong to resist not only abrasion, but the chipping or slicing action due to the removal of the slag by manual labor. In general, the firebrick manufacturers have not kept pace with the development of boiler and furnace construction and operation.

WATER POWER

The committee reported that the past year had been notable for inactivity in the promotion of low-head hydroelectric generating stations, which was partly accounted for by the decreasing cost of electrical energy generated in large modern steam stations. There has been some activity in the replacement of low and moderate head units of old design and lower efficiency by modern wheels. Due to the improvements made in thrust bearings, the vertical type of wheel is giving excellent results. There is also a strong tendency toward increased simplicity and better design of water wheel auxiliaries.

The usefulness of water from an economic standpoint depends on the cost of development, including transmission lines, and the cost of fuel at some point contiguous to the market which is to be served. The cost of delivered power from the largest and most favorably located hydroelectric development is little if any less than the cost of steam power from the larger modern steam-plants if the cost of fuel is not excessive. Within the past few years there has been a marked improvement in the reliability of the modern hydroelectric station.

The committee presented a resolution to the effect that the association should bring to the attention of the appropriate national engineering societies the present lack of a standard method of determining the head on water wheels under test when set in spiral casings, closed or open flume, and requested that these societies recommend a method of determining this measurement, which can be adopted as standard.

Central Station Power for Railways

A committee appointed about three months ago on energy supply for electrification of steam roads presented a report in which, among other things, a change in the name of the association to give recognition to the widespread use of electricity was recommended. The report stated that enough examples of power supply to railways by power companies have been made to demonstrate that such procedure is of great benefit to both parties and to the public. The railway company is a distributor of people and goods, whereas the electric power company is a distributor of electrical energy. The two types of utility represent distinct and specialized functions. In some cases railways which formerly generated power spent much effort in reducing the cost of production, whereas now, as purchasers, they concentrate their efforts in preventing waste of power. In Chicago, the entire power requirements of the electric railways are being furnished by the central power company, which during 1915 supplied 680,112,000 kw.-hr. at an annual load factor of 41 per cent. Economies result from the diversity of load and from the use of substations for supplying power to more than one railway and for lighting purposes. The census report for 1912 stated that one-third of all power used by electric railways was purchased, and the committee estimated that at present the ratio is one-half and increasing rapidly.

PREPARING TO HANDLE RAILWAY POWER BUSINESS

If the central power company desires to supply the electrified steam railroad with power ten or more years hence, it should begin at once to plan for that possible supply. The best way to prepare is to supply the street and interurban railway power. In general, the central power company can most economically attend to the production, transmission and conversion of such power up to the point of delivery in the substation to the outgoing railway feeders. In cities where the street railways are supplying their own power at present, it will not be many years before their facilities become inadequate and then the central power company should, as a matter of broad economics, supply the power. In the present state of the industry, it is not a very difficult matter to supply power for the electrification of terminals in large cities from extensions to existing central power systems.

In the case of main line divisions hundreds of miles in length, another problem arises in the sale of purchase of power except in those rare cases where one single power company already owns and operates all electric power plants along an entire railroad division, and also owns and operates an interconnecting high-voltage transmission line along or near such railroad's right-of-way. In the case of the Chicago, Milwaukee & St. Paul Railway, the Montana Power Company had lined up a sufficient number of interconnected power plants to be able to deliver electrical energy to the railroad at various points along the entire 437 miles of electrification. In the electrification of divisions of railroads, either power plants will have to be similarly interconnected for long distances paralleling railroads, by the central power companies getting together themselves, or else the steam railroads will have to build such high-voltage transmission systems.

A feature that will have considerable influence in deciding between electric power supply for electrified divisions for power stations operated by the railroad company and power service from the central power company is the reduction in the capital requirements for electrification. It is generally recognized that the supply of power to any community for light, street railway and

industrial uses should centralize to avoid duplication of investment and to serve the best interests of the public generally. The supply of power for the electrification of steam railroads should form no exception to this rule.

In a paper on the same subject, Fred. Darlington, consulting engineer, New York, stated that power systems should be operated as monopolies to avoid splitting up generating plants and duplicating transmission lines. This means that they will be operated under government regulation. Liberal laws should provide for the utmost extension of unified systems, not only with intrastate, but with interstate connections. Increased size of generating units, which is the result of unification and of taking on new loads, secures better economy for central generating plants and reduces the cost of power. The best means for railroads to secure electric energy for motive power is to buy it from large public service electric plants, rather than to make it in smaller plants of their own. This is also in accord with a generally recognized principle that it is undesirable for railroads to engage in business foreign to their work as common carriers. As indicating the extent of this field, Mr. Darlington stated that there are about 65,000 steam locomotives in service in the United States of an aggregate capacity between 50,000,000 and 60,000,000 hp. These in 1914 consumed 150,000,000 tons of coal, costing \$243,500,000.

He expressed the opinion, further, that the rapid extension of unified electric power systems weighs heavily in determining railroad electrification methods. Every increase in the size and scope of transmission systems and their connected generating plants has reduced the cost of electric power. In most instances the main transmission lines of the power system follow the general direction of the steam railroads, and in several instances the availability of central station power has been a determining factor in heavy railroad electrification. Undoubtedly the prospects of further steam railroad electrification are quite as much advanced by the extension of electric power transmission systems as by the improvements in railroad electrification apparatus.

East River Subway Tunnel Inspection

Engineers of the Public Service Commission for the First District of New York have just reported the result of an inspection of the south tube of the Battery-Joralemon Street subway tunnel under the East River to Brooklyn. The inspection was made to ascertain the extent of change, if any, in the position of the tube since the time of its completion in 1908. Careful observations were made, and it was found that during the period of eight years in which this tube has been in daily operation there has been absolutely no settlement. Other observations showed that there had been no movement whatever in a lateral direction. Examination of the lining of the tube showed that the leakage, which has always been slight, has materially decreased during the period of operation. The engineers will make a similar inspection of the north tube of the same tunnel within a short time.

A tabular statement which has been prepared in connection with the electric train service between Manchester and Bury, recently placed in operation, shows that the electric systems cut down the time of the journey substantially. By steam train the journey from Manchester to Bury, with stops, is shown as taking thirty-two minutes as compared with twenty-four minutes on the electric service. From Bury to Manchester the time by steam train is twenty-nine minutes as against twenty-two minutes by electric train.

Illinois Decision on Valuation

In Springfield Gas & Electric Case the Commission Looks Upon Original Cost as a Very Important Factor—Discusses Paving Allowances, Overhead Charges, Going Value, Depreciation and Rate of Return

THE Illinois Public Utilities Commission recently handed down a decision in Case 2138, City of Springfield vs. Springfield Gas & Electric Company, which is probably the most important decision in rate-making and valuation procedure yet delivered by this comparatively young commission. The Springfield Gas & Electric Company is owned by the Springfield Railway & Light Company, Springfield, Ill., one of the Hodenpyl, Hardy & Company properties. In its order the commission, among other things, discusses at considerable length the subjects of methods of valuation, paving allowances, overhead charges, depreciation, going value, the rate of return and procedure expenses. It fixes 7 per cent per annum as a reasonable rate of return upon an \$800,000 valuation, and on this basis orders a reduction from \$1 to 80 cents per 1000 cu. ft. of gas. The company has taken an appeal to the Circuit Court of Sangamon County.

VARIOUS APPRAISALS SUBMITTED

In the case before the Illinois Public Service Commission five different appraisals were submitted and recorded at the sixty-two hearings held in the matter. Two of the appraisals were by the city, two by the company and one by the commission. The valuations of most of the experts were appraisals of essentially the same inventory, prepared by the company's employees and field-checked by the commission's engineers. The appraisers, however, used various methods of determining their valuations, and no two followed identical theories. One of the city appraisers used as the basis of valuation the cost at which property of an equivalent effectiveness or capacity could be installed, the reproduction cost new of \$715,852 of such an equivalent plant at present-day prices being depreciated in accordance with its age to give a present value of \$547,448. This engineer advocated the use of prices current at the date of valuation, without any deviation tending toward an average of fluctuating prices on certain classes of material and labor. The other city appraiser prepared a valuation based upon data obtained from the company's books. He applied unit prices to the entire distribution system (about 50 per cent of the property) and lumped the other items into large classifications to which book prices and data were applied. He then depreciated his book value of \$765,172 in accordance with life tables, supplemented with some actual inspection of equipment, and thus established a present value of \$588,262.

One of the company's appraisers used as the basis of valuation the cost of reproducing the property under present-day conditions at present-day prices, average prices for the last six years being used on fluctuating material and labor. The result was a reproduction cost of \$1,074,856. Depreciation was determined from actual inspection wherever possible, and otherwise from age and assumed life, and in this case the present value figure was \$898,785. The other company engineer made his valuation upon the cost of reconstructing anew the existing system under the identical conditions which obtained at the time of original installation, the prices being the current market quotations of the date of valuation, modified by five-year average prices on fluctu-

ating material and labor. Under this method the cost new totaled \$1,075,304. The depreciation was determined in a manner quite similar to that of the other company engineer, and the present value result was \$940,988.

The commission engineer based his valuation upon the original cost of the system at the time of the installation of the various items composing the aggregate property to-day, and where exact costs of some items were not obtainable from the company's records, he estimated the cost of similar items installed under similar circumstances as of the time of the actual installation. The total original cost thus determined was \$953,988. After figuring the depreciation from an actual inspection of the visible property and from life tables and experience where the property could not be inspected, the commission appraiser found a present value of \$806,404.

CRITICISMS BY THE COMMISSION

Thus the company's figures were the highest, the city's the lowest, and the commission's intermediate. In general, the company's experts employed the reproduction method of valuing the duplicated property, whereas the city's experts used either the reproductive equivalent-plant method or the book-cost method, and the commission engineer employed the original-cost method. In fixing the present value of the property at \$800,000, the commission does not adopt any particular one of these valuation plans, for in its opinion no theory has been developed to a stage where it may be regarded as the panacea for all rate-making ills, and the courts have been extremely cautious in committing the judiciary to one method or another.

In commenting upon the various theories, however, the commission remarks that, as between duplication of identical equipment in a wholesale manner and reproduction of service through the creation of a modern equivalent plant, the latter avoids the principal fallacy of the reproduction-new theory. Furthermore, in its opinion it is worthy of note that the trend of rate regulation indicates more and more weight to be given by both courts and commissions to a careful and reasonable application of the equivalent-plant theory. Moreover, the commission criticises the reproduction of identical plant under past conditions at present prices as being a hybrid method, the application following the original-cost method as regards piecemeal construction and sequence of operations but the reproduction method in the use of present-day prices. If the reproduction method is to be utilized as a guide to value, the commission says, a reasonable application of the theory is to be expected. Viewed thus, a reasonable reproduction theory contemplates the duplication of the existing plant in a wholesale manner at present-day prices.

In general, the commission holds that the reproduction method, whether of identical plant or of service, is open to criticism upon the ground of unstableness, for valuations on such bases reflect the dictates of a particular date. With changes in prices, particularly the general increasing trend of prices, the valuations must change accordingly. On the other hand, the commission notes that the book-cost valuation of one city engi-

neer and the original-cost valuation of the commission engineer are attempts to reach facts in existence, rather than to derive values based upon some theoretical premise. These two valuations, therefore, are more stable than the others in so far as prices are founded upon facts in the records of the company and are not subject to theoretical fluctuations. The commission engineer, in particular, appraised a carefully prepared and painstakingly compiled inventory and based his appraisal (except overheads) upon actual cost figures secured as far as possible from the company's books and records, and in the absence of actual records of original cost he estimated the cost of construction as of the time of installation. Hence the unit costs used by him are said to reflect quite exactly the extra cost of piecemeal construction for which counsel for the company vigorously contended. Finally, the commission states as noteworthy the fact that Halford Erickson, as chairman of the Wisconsin Railroad Commission, after years of experience volunteers the opinion that "original cost of existing property can be had with even greater accuracy than the cost of reproduction." In short, therefore, while the Illinois commission will not consider any one valuation method to the exclusion of all others, the present decision seems clearly to indicate the weighty importance that it attributes to original cost as a factor in public utility valuations.

NO ALLOWANCE FOR UNDISTURBED PAVING

One of the first debated questions that arose in the present case was in connection with an allowance for undisturbed paving. On this point the commission holds that paving actually cut and properly replaced in the installation of service is an element to be reasonably valued in a rate inquiry, but it dismisses paving not actually cut and replaced with the following words:

"Undisturbed paving, despite the claims of certain advocates of reproduction-cost-new theories, has no place in the case at bar. No legitimate reason can possibly exist for demanding that the public, after having improved its city streets at great expense, should pay a higher unit price for service owing to the fact that the pavement, which is the property of the public itself and not owned by the utility, possesses value. This and similar claims often lead the reproduction theories to irreconcilable absurdities and render the same of lesser weight as evidence in valuation proceedings than would prevail either in more consistent theories or in more reasonable applications of a reproduction theory."

ONLY GENERAL FINDING ON OVERHEAD CHARGES

In the matter of the usual overhead charges the gas company made extensive claims, but the commission made no direct finding other than to state that it believed the company claims to be excessive. In its opinion items of overhead usually exist in an original-cost theory, but, more often than otherwise, a large portion of such costs is reflected by the charges existing on the utility's books either in the capital or the operating accounts. Moreover, it is said to be a generally recognized fact that, in a given valuation, the overhead percentages applicable to an original-cost method are considerably lower than those applicable to a reproduction method of appraising the identical property. The commission holds its own engineer to have erred in not adhering more closely to his theory of original cost, for he evidently neglected when fixing overhead percentages to take account of portions of overheads which ordinarily could not escape being included in the original cost of many items. It refuses to sanction, however, the entire claim of the city that in the commission engineer's theory of valuation all overheads should be excluded. It is quite true that in

a plant constructed in a piecemeal fashion, items for engineering, supervision, legal expense, administration, insurance, taxes, etc., are met very largely by expenditures in the operating account. In its opinion, however, there are certain items, such as interest during construction, preliminaries, legal expenses, etc., which would nowhere appear in the costs set up in the commission engineer's valuation. Such original costs as might be available from the books could not reasonably be expected to include all proper overhead charges, and for this reason it would be unjust and unfair to the company to disallow completely in this particular case the item of overheads in a valuation based on the original-cost theory. The commission, therefore, arrives at only the general conclusion that the company's and its own engineer's overhead percentages are excessive.

DEPRECIATION SHOULD BE DEDUCTED

In the opinion of the commission the weight of authority compels a reasonable deduction from cost new for accrued depreciation—both physical and functional—and further requires, in equity to both consumer and utility, an identical treatment of the subject in all its phases. Owing to the mass of conflicting testimony and arguments, the commission says that it is by no means certain that the company's counsel raised the issue of total non-deduction for accrued depreciation, or merely took the position that only actual physical depreciation should be deducted. The valuations submitted by both of the company's experts embraced allowances to cover accrued depreciation under these experts' theories.

In the case at bar, the commission has decided that the company's past operations have been so successful that there can exist no doubt but that accrued depreciation has been met and paid back to the investors by the consumers. Very liberal dividends have been paid on all outstanding stock, in addition to interest and other charges which have been paid out of earnings. As to surplus funds, the record shows that the company always has been liberally provided. Ample rates, in short, have been charged and collected to cover all maintenance and operating expenses, to provide ample dividends on capital stock, and, in addition, to establish a more than adequate fund to protect any amount of accrued depreciation which may be reasonably determined by competent experts to exist in the Springfield property at the present date. In the present case the depreciation fund is represented and reflected either by past reinvestments in additions and betterments to the property or in the surplus fund—or in both. The Supreme Court (212 U. S. 424) clearly stated that no part of money raised for accrued depreciation should be added to the capital account, especially where the same has been invested in additions and betterment to the property, and from the language used in this case it obviously would be wrong to allow a rate of return upon portions of utility property constructed out of an accumulated depreciation fund. The burden is upon the utility to show that it has not collected sufficient rates to cover all accrued depreciation.

ANALYSIS OF GOING VALUE

To measure the element of going value, the company proposed some one of the following "rules of thumb" as measures: 25 per cent of the value of the physical property; \$30 for each gas consumer in Springfield, and \$5 for each inhabitant of Springfield. The commission holds, however, that going value, in its commonly-accepted meaning, either may or may not exist in a given utility, and its determination in any event rests upon the facts governing a particular case and not upon such "rules of thumb" as the foregoing.

Of the array of definitions for going value, four con-

structions placed upon this term have been recognized more or less authoritatively, which are noted by the commission as follows:

(a) Going value may be interpreted to mean the mere attribute of a utility in normal action—operating, engaged in business and organized.

(b) Going value may be the difference between the exchange value of a utility (were it possible to sell or to purchase the same in the open market) and the present appraised value of its physical property.

(c) Going value has been used synonymously with "good-will," *i.e.*, the probable continual resorting of customers to the old stand.

(d) Going value has been defined to mean the net uncompensated deficits sustained by a utility when operating at a loss during the very early years of its existence.

As to going value designated as "a" (the organization of a utility business), it is often asserted that this is to be measured by the amount expended in accounts known as "new business," "free demonstrations," "commercial expense," etc. The advocates of this theory, the commission states, usually fail to distinguish between, whether or not such items as this have been met in the operating accounts, which during past years have been borne by the consumer. If the former consumers have reimbursed the utility fully for this type of expenditures, then it is obviously improper to capitalize a duplicate charge against the future generation. On the other hand, if the past revenues of the utility have been insufficient to meet fully all expenditures along these lines, the deficit unavoidably must appear in any proper compilation to determine going value by the deficit and surplus method "d." Moreover, going value "a," if loosely considered, is subject to confusion with going value "c" (good-will), and the dividing line between the two is by no means definite.

As for going value "b" (exchange differential), it may be stated that this has no place in a rate determination on account of the resulting work in a circle. In regard to going value "c" (good-will), the courts have established that this element has no place in the fixing of valuation for the purpose of rate-making for public service corporations. This exclusion of good-will has eliminated the use of that term in rate-making for monopolistic public utilities, but its equivalent is ever-present. Owing, no doubt, to a confusion of terms, utilities display a tendency to make claims for a capitalization of connected consumers, for a capitalization of the population served, for an intangible valuation of a business organization occupied in serving the public and for other elements of exchange value—all in lieu of a now obsolete application of a good-will element to monopolistic public utility property. Utilities are likely, moreover, to confuse this good-will point of view of going value to mean the attributes of model operation and management, and to claim value in the capital accounts for features which, so far as charges to consumers are concerned, should be considered with more logical propriety in the rate of return. In this connection claim is often made for exceptionally competent supervision, but this, like incompetent supervision, cannot be regarded as an element of capital value. Proper reward for competent management is to be secured through adjustment of the rate of return.

In discussing going value "d" (accrued deficits in early operations), the commission recites the development of this method of establishing going value by the Wisconsin Railroad Commission, and mentions the common criticism that this method unavoidably rewards past inefficiencies of management and design. The commission notes that some modifications of the Wisconsin method have been suggested to it in rate-making

and security-issuance cases, but that, in applying the methods, many of the experts are prone to err in an improper disposition of estimated depreciation. In other words, few appraisers, in computing going value, will give the same consideration to depreciation in the capital account that the identical subject receives in the annual operating expenses. When depreciation is consistently treated at every point, the commission avers, many a fanciful going-value table is changed from a net deficit to a net surplus. Under the Wisconsin method, according to the commission, two courses to pursue in the treatment of depreciation in its relation to going value are open. (1) For each annual charge to cover depreciation, the capital account should be reduced by the identical amount charged against depreciation, taking into consideration, of course, that plant extensions and betterments should be added progressively to the capital account. (2) If the computer is insistent that the original capital charge must be preserved, the going-value table should be made sufficiently comprehensive to include the depreciation fund which is being accumulated through the medium of annual charges, and this depreciation fund must be credited with its earnings.

Closely allied with the deficit-and-surplus method of computing going value is one commonly designated as the reproduction-of-a-predetermined-income method or by some equivalent name. The method, in the commission's opinion, is purely hypothetical and conjectural, is predicated upon the assumption that going value absolutely exists in a given utility property, is subject to many varying assumptions and is susceptible to any solution which the computer may desire to attain. This reproduction method of computing going value at best is little better than guesswork, and as such is devoid of any substantial merit. Regulatory commissions, as a general rule, have repudiated this method.

Taking up the specific claims of the Springfield company for going value to the extent of \$250,000, the commission observes that one of the methods used in reaching this figure falls in the classification designated as going value "a." The figures tabulated by the company's expert as representing expenditures made by it in the past to acquire its existing business, however, have all been paid out as past operating costs, and the commission feels that no reason can possibly exist for capitalizing such expenditures. Were they not reimbursed to the company, they would automatically appear in a correct computation of the deficit-and-surplus tables. The other two methods of the company's expert come under going value "d" with its reproduction variation. No comment is deemed necessary for the variation, but the commission proceeds to criticize the deficit-and-surplus tables upon several scores. The main criticism is that in spite of a high operating allowance for depreciation no effort was made to handle the depreciation consistently in connection with the capital accounts. The commission's engineer submitted a computation of going value based upon the past deficit-and-surplus method and arrived at the conclusion that the company's past operations reflected surpluses instead of deficits. The commission's general finding, therefore, is that there is no proof that the "investment necessary to organizing and establishing the business" has not "been already compensated in rates charged and collected under former ordinances," and that the past earnings would more than indicate the early losses have long been reimbursed.

In discussing the idea that some value ought to be added to a going concern over the "bare bones" of the physical structures, the commission states that when utility property is appraised by an expert for rate-making purposes, there is little doubt but that the same

is valued as a living and going concern. Certain of the company's appraisers distinctly stated that they had not included any computation of going value in their valuation. In a technical sense, however, these witnesses meant no more than to say that they had not made distinct and separate calculations of going value by any of the before-mentioned methods. Consciously or unconsciously they must have appraised the property in Springfield as a living entity. Were this not so, then the only value that could be attached to the property would be the scrap or junk value of its component parts.

REWARDING GOOD MANAGEMENT THROUGH RATE OF RETURN

The question of an equitable rate of return to be allowed upon a fair value of the company's property in Springfield resolved itself into the definition: "A fair rate of return for rate-making purposes is to be measured by the average annual interest which is necessary to attract capital to invest in legitimate utility securities in the State." The weight of the evidence, the commission finds, would seem to indicate that funds usually can be secured at a figure quite close to 6 per cent per annum, from which it follows that any rate of return in excess of 6 per cent will be compensatory to the shareholders for the inherent risk in the gas-making industry.

The trend of development, however, cannot be predicted with absolute certainty, and emergencies may arise which would make it necessary to allow a utility to earn more than a nominal interest in order that additional capital might be attracted whenever necessary. Moreover, whether or not a utility in its past operations has fulfilled its duty toward the public in rendering service in an adequate and efficient manner by keeping abreast of scientific and economic development, and whether or not it has rendered service of suitable quality to its consumers and conducted its business with a view of giving to its patrons full opportunity to utilize its service to advantage, are matters to be considered with other evidence in reaching a decision as to the proper rate of return.

In other words, a utility which is excellently managed, progressive in development, alive to the public requirements, aggressive in securing new business, economical in operation, courteous to consumers and fundamentally honest in all transactions, should receive greater consideration in the fixing of a fair rate of return than should a utility of which the reverse is true. Taking into consideration all these points, the commission finds that 7 per cent per annum is a fair rate of return upon the allowed valuation, this being equivalent to approximately 15 per cent on the total money actually paid into the Springfield utility's treasury by the investors.

ALLOWANCE FOR ANNUAL DEPRECIATION

The commission has endeavored to handle the subject of depreciation for the future in a manner consistent with its treatment of depreciation in the past. In fixing upon a reasonable and an equitable annual allowance to cover future operating conditions, the commission in general leans toward a straight-line method that provides for the setting aside of equal yearly installments into a depreciation fund. To cover future accruing depreciation, both physical and functional, the commission finds that the company is entitled to an annual allowance of \$15,000. The fund so accumulated should be drawn upon only for renewals and replacements of existing unamortized property and should remain intact in an individual and separate account. The fund should be subject to an annual audit by the commission's accountants and should receive full credit for all interest which it may earn. Furthermore, with the consent and ap-

proval of the regulatory body, coupled with proper and judicious utility management, a large portion of the accumulated depreciation fund either could be invested safely in readily marketable bonds or could be reinvested to advantage in extensions and betterments.

ALLOWANCE FOR PROCEDURE EXPENSES

An interesting question arose in this case as to what disposition should be made of the company's expense extraordinary of about \$30,000 incurred in the rate-making procedure before the commission. The commission has decided, however, that since the date when the rate question was opened, the current rates for service in Springfield have been far more than sufficient to compensate the local utility for every reasonable item of expense (including an adequate allowance for return and depreciation), and the excess collected during this period is greater by far than the total of both the city's and the company's procedure expenses. The commission finds for the city, therefore, that no allowance is to be made to the company for its expenses in this particular case. At the present time, however, the commission is not expressing how it would rule in a case in which the facts disclosed no excess revenue to have been collected during the pendency of rate-making proceedings.

Railways Exhibit Safety Appliances

Progress in the invention of safety appliances and practices of all kinds was vividly illustrated in the exhibit of the Third National Exposition of Safety and Sanitation, held during the past week in the Grand Central Palace, New York, under the auspices of the American Museum of Safety. Advance in modern railroad safety methods formed an important feature of the exhibit, as shown both by the displays of the railroad companies and those of the manufacturers of special safety appliances. An array of photographs exhibited by the Union Traction Company of Indiana, Anderson, Ind., the winner of the Anthony N. Brady medal, illustrated the careful attention to details of safety which have contributed to this company's enviable accident record. Among the features shown by the photographs were the following: bridge crossings where the crossings at grade have been eliminated; clearings made alongside a right-of-way which was formerly obstructed by trees; stop signs on poles for speed reduction, indicating proximity of curves or railroad crossings; scaling ladder and handles on the side of cars; motormen's mirror; broad luggage racks in cars; and sanitary drinking fountains for stations and shops.

Safe practice in rapid transit subways was represented by the exhibit of the Hudson & Manhattan Railroad, which was awarded the Travelers' Insurance Company medal this year. In this exhibit the operation of the mechanical track-lever automatic stop, used on this system, was demonstrated by a miniature working model of a train of cars electrically connected to a full-size section of track on which the automatic stop was installed. Labels were posted on the track section, calling attention to such features designed to reduce accident risks, as non-inflammable jarrah wood protective board covering for the third-rail; 100-lb. guard rails with malleable-iron guard brace; screw spikes, and vitrified ducts for carrying cables. A large assortment of safety apparatus and photographs of safe and unsafe practices were also displayed at the booths of three steam railroads having electrified sections, these being the New York Central Lines, Baltimore & Ohio Railroad and Norfolk & Western Railway. All of the railroads mentioned in the above article received grand prizes for their exhibits.

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.

Steel-Tire Removal

BY R. R. POTTER

Superintendent of Equipment New York, Westchester & Boston
Railway

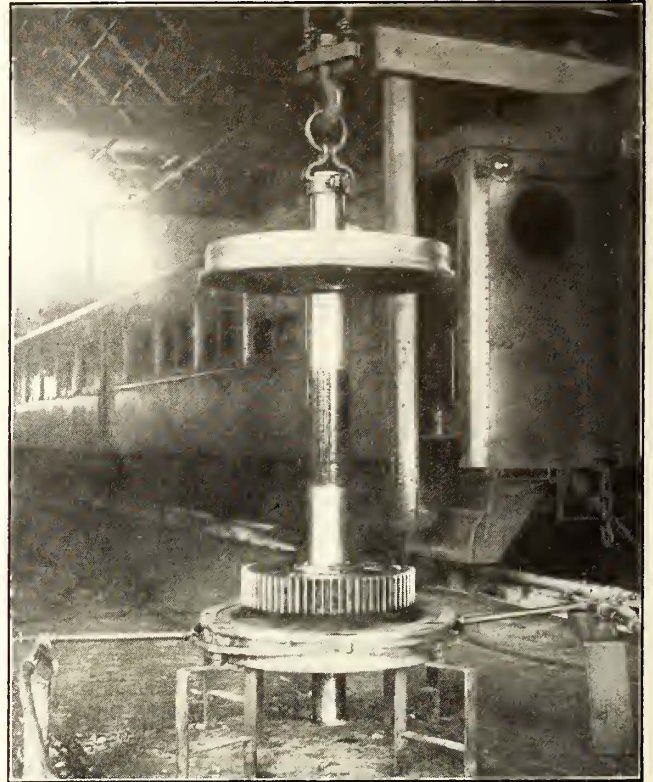
A modification of the customary method of removing and applying steel tires by the use of the gasoline or oil torch has been adopted with excellent results on the New York, Westchester & Boston Railway. The scheme involves the use of an overhead jib crane or one of the overhead, traveling type, the latter being provided in the Westchester shop, and with this the wheels are lifted and held with the axles vertical, while this work is being done. A split collar, or clamp with a bail, which is slipped over the journal end and tightened up enough to catch on the journal collar, is used to provide a ready means for attaching the crane hook. This device is used in preference to a yoke attached to the wheel spokes, because the wheel centers on the Westchester cars have an odd number of spokes and therefore do not provide a symmetrical support when the wheel set is up-ended. A symmetrical support is necessitated by the fact that a minimum amount of expansion for the tire involves such small clearances that the wheel set must hang absolutely true to enter or leave the tire without binding.

A pipe torch is used for applying heat to the tire, but this is supplied with city gas and air under compression instead of the gasoline or fuel oil customarily used, this source of supply having been found less expensive and more convenient than the others. The torch, instead of being made in a full circle of perforated gas pipe, is made in two halves each with its own supply hose, and these, together with three stands made from 1/2-in. x 3-in. strap iron, complete the equipment. The use of a torch made in two halves permits its ready adaptation to various sizes of tires without having to bend the gaspipe. At the same time the arrangement makes it easy to remove the torch from around the tire when a sufficient amount of heat has been applied.

When a tire is to be removed, the wheel set is up-ended by the crane, and is placed upon the strap-iron stands which hold the wheel-set high enough so that the end of the lower journal clears the floor. The crane is then released in case there is no other work for it to do, and the semicircular gaspipe torches are placed on blocks, so that the flame from the inner periphery of the pipe impinges on the tire, this flame being applied until the tire is loose. When a tire is being removed, the amount of heat required to loosen it is so small that it is customary to leave the crane in position, raising the wheel set slightly as the tire becomes hot, and knocking it off the center with sledges as soon as it begins to move.

When the tire is loose the crane is used to lift the wheel set, leaving the old tire on the stand, and this is removed and replaced by a new tire. To this the gas flame is applied until it has expanded enough to permit the entry of the wheel center, and the wheel set is then lifted into place and left on the stand until the new tire has shrunk into position.

The obvious advantage of this method lies in the ease



RIG FOR REMOVING STEEL TIRES IN WESTCHESTER SHOPS

of handling the various pieces involved, and in the certainty of having the tire set true on the center when the shrinkage takes place. On the Westchester cars the wheel centers are made with a collar that fits into a recess at the inside of the tire, and since the weight of the wheel set is supported on this while the tire is cooling, there is no possibility for the tire becoming skewed as it contracts, and thus having to be reheated and adjusted once more.

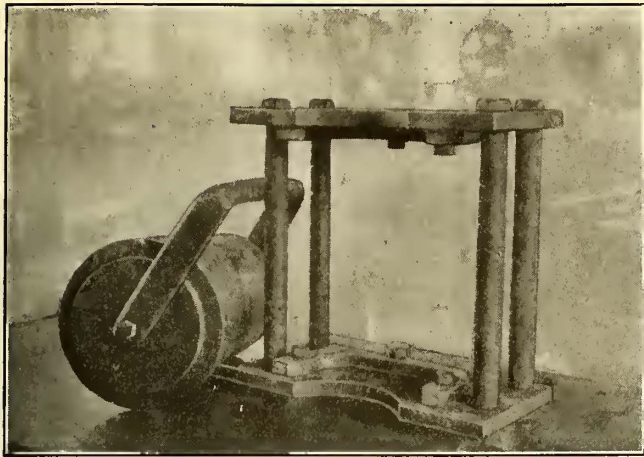
Babbitting Jig Eliminates Hot Journals

BY M. F. FLATLEY

Master Mechanic Terre Haute, Indianapolis & Eastern Traction
Company, Lebanon, Ind.

Accurate journal-brass babbitt linings are a very important factor in the elimination of hot journals, and when both accuracy and a reduction in labor cost can be secured by the use of inexpensive jigs, no electric railway should permit journal brasses to be neglected in this particular. The babbitting jigs and mandrels shown in the accompanying illustrations were designed for lining standard M.C.B. journal brasses and were manufactured in the shops of the Terre Haute, Indianapolis & Eastern Traction Company at Lebanon, Ind. These jigs have reduced the cost of babbitting to a minimum, and the character of workmanship has also been greatly improved by having the babbitting done by one man who has been schooled in the work and has some knowledge of metals.

The larger jig shown is used for babbitting 5-in. x



MANDREL AND FRAME FOR 5-IN. X 9-IN. BRASS

9-in. journal brasses. The frame in which the brass is placed for babbitting is substantially made and consists of steel end plates $\frac{1}{2}$ in. thick, 5 in. wide and 9 in. long, separated by four $\frac{1}{2}$ -in. tie bolts fitted with pipe separators. These bolts clamp the frame together, and the space between the plates is made the exact length of a standard 5-in. x 9-in. brass. The steel-rests on the inside of each end plate, formed of $\frac{5}{8}$ -in. x 1-in. steel, fit the outer ends of a brass so that it is held securely in position during the babbitting process. These rests are fastened to the end plates with four $\frac{3}{8}$ -in. cap screws which pass through slotted holes, thus permitting the rest to be sprung to accommodate any slight variation in the outside dimensions of the brass.

The mandrel is 5 in. in diameter, being turned from a $6\frac{1}{2}$ -in. shaft. A $\frac{3}{4}$ -in. fillet to correspond with the axle fillet at one end of the brass is provided, and during the babbitting process this fillet rests on one end plate and fixes the thickness of the babbitt lining. The mandrel is fitted with a steel pipe handle so fastened at its axis with $\frac{5}{8}$ -in. cap screws that the mandrel revolves. This permits the operator to pick it up when heated and place it in the jig without paying any attention to the part that comes in contact with the babbitt.

Essentially the procedure pursued in babbitting journal brasses begins with melting the babbitt from the old brasses. About 15 per cent of new babbitt is added to this old. If, after the old babbitt has been removed, the brass is found to be dirty or there is any indication that the tin might not adhere, it is carefully ground with a small carborundum wheel mounted on a flexible shaft. An acid solution is then applied after which the

brass is dipped in the tinning pot, quickly removed and placed in the babbitting jig. In this position the heated mandrel is applied and the interval between the mandrel and the brass is quickly filled with babbitt. As soon as the babbitt has set, the operator may remove the finished brass and make ready for the next one.

The speed with which the babbitting process is done insures a secure bond between the babbitt and the brass, because all the work is done while the metals are hot. To obtain a good bond, however, the tinning of the brass is essential. The space between the mandrel and the brass to be babbitted is fixed so that not more than $\frac{1}{8}$ in. of babbitt is applied in any one babbitting. To test the bond between all three metals thus applied in the babbitting process, the brass should ring clear when struck with a hammer.

Prevention of Drawbridge Accidents

BY G. B. TANIS

Trolley cars are subject to accidents at drawbridges used over rivers, due to the opening of the bridge just as the car reaches it, unless some means of killing the trolley wire before the bridge is opened is provided.

The accompanying diagram shows a foolproof method used on a number of bridges in Brooklyn to prevent such accidents, at places where the electric railway power is

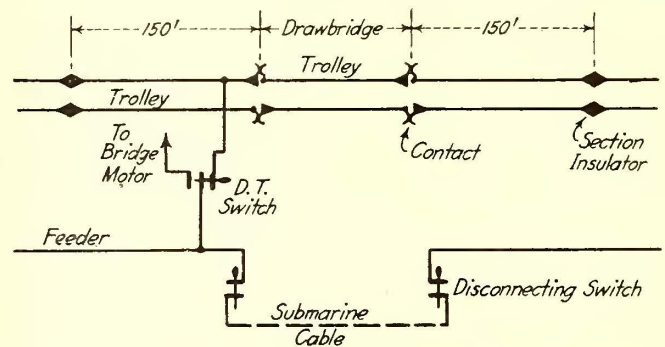
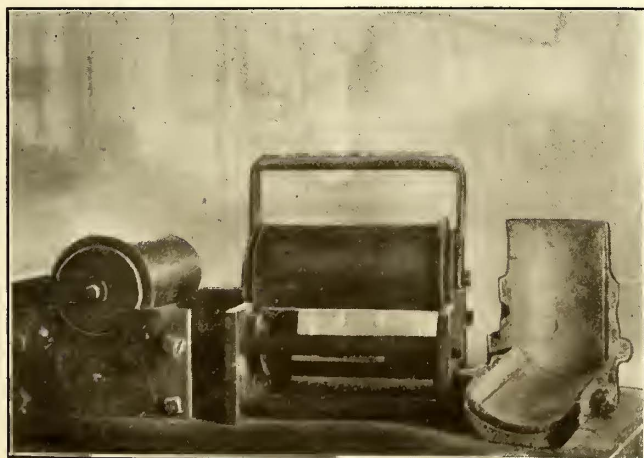


DIAGRAM OF TROLLEY AND FEEDER CIRCUITS AT DRAWBRIDGES

also used to open the bridge, for the passage of ships. Section insulators are placed in each trolley wire about 150 ft. before the bridge is reached. The trolley wires of this section are fed by a double-throw switch, the feeder being connected to the switch blade. As the trolley circuit is on one clip and the motor circuit which operates the draw is on the other, it is impossible to open the bridge without killing the trolley wires, thus preventing the operation of cars in the immediate vicinity of an open bridge.

Car for Roadways and Tracks

A car suitable for running on rails and also on highways has been designed by W. F. Holt, president and general manager Holton Inter Urban Railway of Redlands, Cal. It is intended primarily to compete with the jitney, and one will shortly be put in operation over the Holtonville Inter Urban Railway between El Centro and Holtville, Cal. The feature of the car is the type of wheel employed. This wheel has three tires, two of rubber for running on the highway and one of steel for running on the rails. In a patent which has recently been issued to Mr. Holt for this wheel, the steel tire is shown as between the two rubber tires and of smaller diameter, so that the rubber tires act as flanges when the car is running on an exposed rail and as tires when the car is running on the highway.



COMPLETE JIGS FOR TWO SIZES OF BRASSES

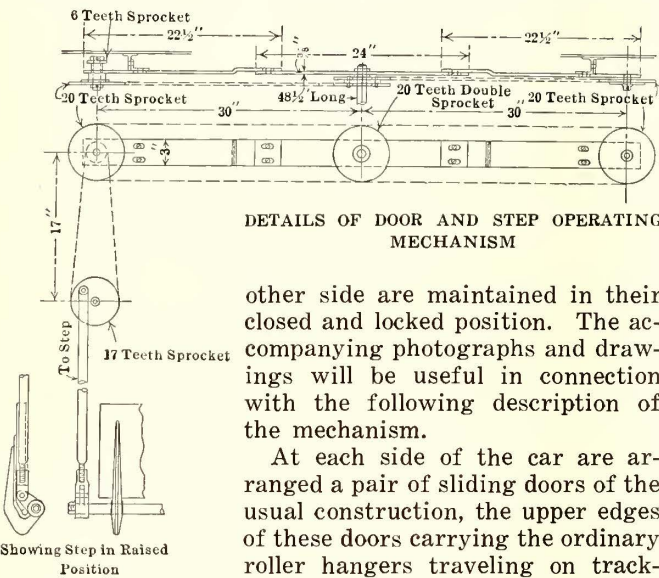
Mechanical Door and Step Operating Device for Center-Entrance Cars

BY A. TAURMAN

Superintendent of Rolling Stock Virginia Railway & Power Company, Richmond, Va.

Early in 1914 this company placed in operation a number of center-entrance cars. These were described in the issue of the *ELECTRIC RAILWAY JOURNAL* of May 16, 1914. After the cars had been in service for a short time a manual device for opening and closing the doors and raising and lowering the steps was devised by the writer, and this has since been applied to the cars. As the results were very satisfactory from the standpoint of maintenance cost, an application for a patent was filed and the patent was granted some months ago.

The device is manually operable from the conductor's well or platform. In addition to controlling the doors and steps simultaneously, the device also serves to lock the doors in a closed position on both sides of the car, which is desirable under certain conditions. Ordinarily, however, the mechanism is used to operate the doors and steps on one side of the car while the doors on the



DETAILS OF DOOR AND STEP OPERATING MECHANISM

other side are maintained in their closed and locked position. The accompanying photographs and drawings will be useful in connection with the following description of the mechanism.

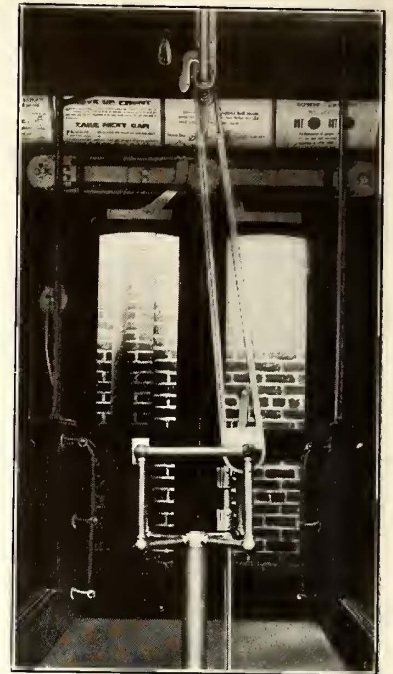
At each side of the car are arranged a pair of sliding doors of the usual construction, the upper edges of these doors carrying the ordinary roller hangers traveling on trackways, so that the doors are hung to slide towards and from each other in the usual manner. Journalled in a stand at the middle of the well is a small power shaft operated by a crank handle, this shaft having fast thereon a sprocket wheel. This sprocket wheel drives an endless chain which trains over another sprocket wheel, fast with a shiftable clutch sleeve, which, in turn, is loose on a divided operating shaft extending across the car adjacent to the roof and above the doorways.

The drive chain travels in a vertical direction, protected by a casing, the lower end of which is provided with side plates to form a housing for the sprocket. Each part of the divided shaft has on its end next the clutch sleeve a toothed clutch member, so that either part of the shaft may be placed in driven engagement with the power shaft through the chain and sprocket connections. The outer ends of the divided shaft are journalled in bearings carried by plates located at each side of the car above the doors. Mounted on the divided shaft adjacent to the outer ends thereof are double-sprocket wheels, each of which drives a pair of oppositely extending, horizontally disposed endless chains, which travel over single sprocket wheels mounted on stud shafts carried by the plates. Each stud shaft is provided with a small sprocket adapted to impart motion to a vertically disposed endless chain located at one side of the doorway,

this chain in turn driving a crank sprocket mounted on a stud shaft. To this crank sprocket is eccentrically pivoted one end of a vertical lever rod, the lower end of which is threaded and screwed into a coupling member connected to a crank-arm fast on a rock shaft. This shaft carries the step, which is mounted on the shaft in the usual way, by means of angular bracket arms.

The doors at each side of the car are connected with the adjacent chains by means of bracket arms which are bolted to the top of the door, and attached to the upper and under runs of the endless chains by means of pins or studs, so that the chains, when driven by the double-sprocket, move the doors in opposite directions in opening and closing them.

Suspended from the top of the car is a frame, the parallel arms of which are bored at their lower end for the reception of the clutch members, these arms constituting hangers or supports for the inner end of the shaft members. As will be seen by reference to the detail views of the clutch and locking device, the frame is provided with a cross bar located above the shaft, and directly over the double clutch. This bar is bored for the reception of a stud at the end of the yoke lever to form a pivot point for the lever. This lever is employed to shift or slide the clutch sleeve and the locking bar, the latter sliding through slots in the side-arms of the frame. This locking bar also passes through a slot in the lever, the bar being notched so that it may interlock with the walls of the slot. This locking bar is also provided with an elongated central recess to accommodate the sprocket wheel on the sleeve, and is further provided with notches to permit the pins on the clutch sections to pass the locking bar. That end portion of the locking bar which slides through the arm of the



CHAIN DRIVE FOR CENTER ENTRANCE DOORS



CLUTCH MECHANISM FOR DOOR AND STEP OPERATING DEVICE

frame has its upper longitudinal edge formed with a pair of spaced notches, while pivoted to the arm is a latch terminating in an angular handle. This latch, shown in the end elevation drawing of the clutch locking device, is provided with a segmental slot through which projects a pin carried by the arm of the frame, this arrangement limiting the travel of the latch.

When the clutch sleeve is in the neutral or disconnected position it is out of engagement with both clutch members, and consequently neither of the sections of the divided shaft can be rotated through its connections with the power shaft, even though the conductor's handle be operated. Furthermore, these shaft sections cannot be accidentally rotated, for the pins on the clutch members make contact with the bar. However, the lever may be operated by the conductor to shift the clutch and the locking bar longitudinally relative to the shaft, and in either direction, so that one section of the shaft may be placed in driven engagement with the power shaft, and be further rotated, while the other section of the shaft will be out of engagement with the power shaft, and held against rotation.

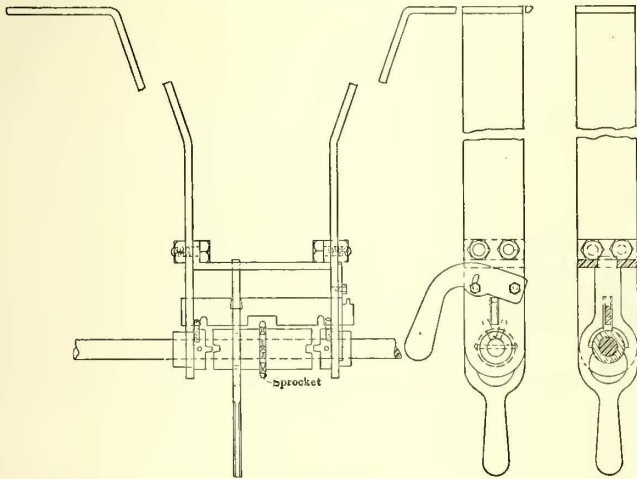
To open the doors at the right-hand side, the conductor proceeds as follows: Grasping the yoke handle he shifts it to slide the sleeve clutch toward and into engagement with the clutch member, as shown in the

same time, the travel of the vertical chain will, through the step mechanism previously described, throw the steps downward and outward into position for use by the passenger. When it is desired to close the doors, the crank handle is swung back into its original position and the reverse movement of the chain and sprocket mechanism takes place, thereby closing the doors and elevating the step. Should it be desired to use the doors on the opposite side of the car the conductor simply releases the latch from the locking bar and operates the yoke lever to shift the clutch sleeve from the right to the left clutch member.

If both doors are to be maintained in closed position, the locking bar is unlatched by throwing the latch upward and the sleeve clutch is shifted to the neutral position, so that neither shaft member is in driven engagement with the power shaft. In this condition, as no power can be imparted to either part of the operating shaft, the doors will remain closed and locked.

Northern Texas Traction Company Operates Through Floods

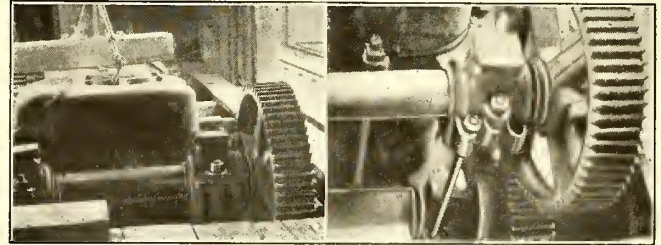
During the recent high-water period at Fort Worth, Tex., the Northern Texas Traction Company successfully operated its cars through water which covered the tracks to a depth of 40 in. for more than a half mile. The water rose to such a height that the north end of the massive reinforced concrete viaduct over the



DETAILS OF CLUTCH FOR DOOR AND STEP OPERATING DEVICE

photograph taken longitudinally to the car interior, thereby placing the shaft member in driven connection with the power shaft. When the yoke handle is so moved the locking bar will also be shifted, so that the notch in the bar will be brought into alignment with the pin on the clutch member to permit the pin to pass through the notch when the shaft section is rotated, and thus not impede the rotation of the shaft member. At this time the other clutch member and its shaft member cannot turn because the pin would strike the locking plate. Furthermore, this movement of the lever to the right, in sliding the locking plate, has brought the notch into position to receive the latch when the latter is depressed. The conductor now depresses this latch so that it interlocks with the notch and holds the locking plate against movement and the clutch sleeve in engagement with the clutch member.

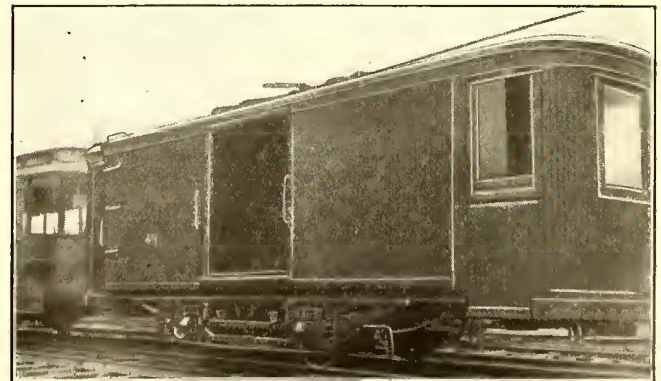
Should the conductor now desire to open the doors, it is only necessary for him to swing his handle, thus turning the power shaft to rotate the sprocket wheel and impart movement to the chain. The rotation of this chain will turn the shaft member, which is now connected with the clutch sleeve, and turning the double-sprocket will move the chains and door brackets connected to them, thus sliding open the doors. At the



ARRANGEMENT OF MOTORS, GEARS AND AXLES ON IMPROVISED CAR

Trinity River was entirely submerged. The viaduct is built on a heavy grade, sloping toward the north, and the road at this end crosses a considerable stretch of low land. The road which passes over the viaduct is the only connection between the city and the north side of the river, and consequently the high water put the jitneys out of commission.

The traction company wished to renew service with as little loss of time as possible, especially since the jitneys were not able to operate. The single-truck car shown in an accompanying illustration, which made this possible, was equipped with a GE-800 motor on each



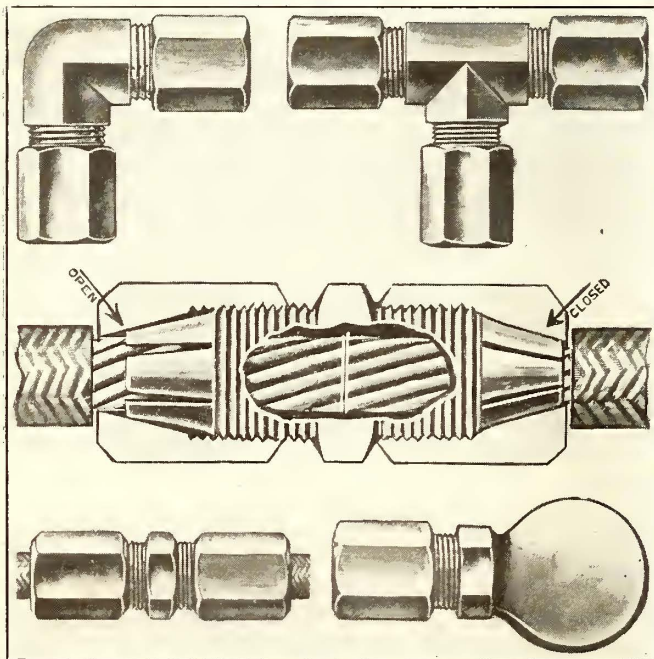
IMPROVISED CAR USED DURING FLOOD

axle. These motors were removed, leaving the cases and gears in place. Another set of GE-800 motors was placed on top of these cases and bolted to them by means of vertical rods. Looped bands were quickly prepared and "fake" axles were arranged as shown. Additional bracing at the top prevented lateral motion and kept the bolts tight. A controller was installed just inside the car. Although the water rose half-way up on the top motor case, this arrangement prevented injury to the equipment.

This high-water car was built over night and placed in service the morning following the 20-ft. rise in the river. An ordinary trail car with a seating capacity of fifty persons was attached at each end of the improvised motor car and the train was run across this stretch of flooded land at about 8 m.p.h. Passengers were transported in this manner for three days and it was sometimes necessary that they raise their feet from the floor in order to keep them dry.

Improved Type of Solderless Connector

The accompanying illustration shows several types of the solderless connector manufactured by the Frankel Connector Company, Inc., New York. The cross-section view in the center shows the principle of the connector



CROSS-SECTION VIEW AND ADAPTATIONS OF SOLDERLESS CONNECTOR

and how the design has permitted the use of the fewest possible parts to make a rigid connection. This simple construction, it is claimed, reduces the liability of the connector getting out of order and in addition provides a connection which is strong mechanically and electrically.

By using these solderless connectors in place of the soldered type connection, the makers claim a substantial saving in time as well as the added advantage of providing a joint that can be broken down without harm to the cable.

As a result of a test to which connectors were subjected the Underwriters' Laboratories, Inc., report that at 1000 amp. the soldered joint melted and dropped apart, while the joint where the wires were connected by the solderless connectors were unaffected by the test.

Compact Storage of Graphic Instrument Records

Three years' capacity in recording meter charts is obtained on two shelves in the office of D. P. Miner, chief engineer of the Manchester Street station of the Rhode Island Company at Providence. The shelves are

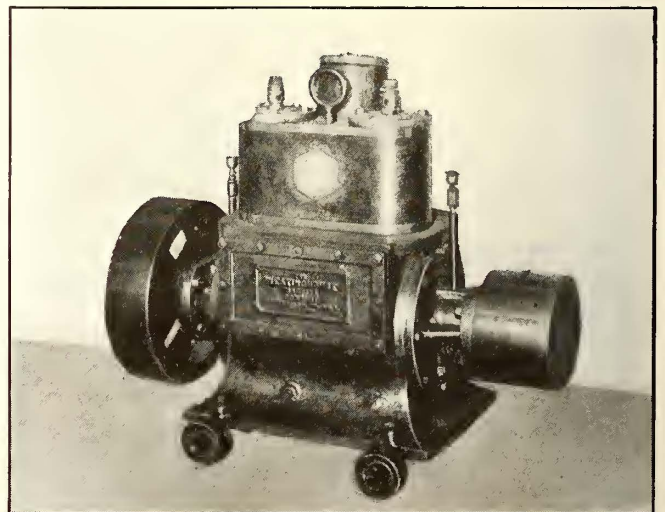


METHOD OF STORING GRAPHIC INSTRUMENT METERS

4 ft. 8 in. long, 10 in. wide and $\frac{7}{8}$ in. thick, each being equipped with five $\frac{1}{2}$ -in. wooden spindles 8 in. high. Ample room for both unused and used charts is available, as shown in the accompanying illustration. The charts are circular sheets showing variations in steam temperature, temperature of exhaust steam at the condenser, vacuum, feed water temperature and draft pressure. In general used records are kept on the bottom pins, blanks being stored and classified just above.

Portable Engine for Station Service

At the Millbury (Mass.) plant of the Worcester Consolidated Street Railway a two-cylinder $4\frac{1}{2}$ -in. x 4-in. Westinghouse vertical engine has been equipped with rollers, as illustrated, to enable it to be used at different points in turning down commutators or other light power work where a steam hose is available. The roll-



PORTABLE ENGINE FOR STATION SERVICE

ers are each 4 in. in diameter and $1\frac{3}{4}$ in. in tread and were taken from an old crane. They run on 1-in. shafts formed at the ends of square braced rods, the shafts being spaced 17 in. apart on centers. The engine is provided with a flywheel and pulley, and if needed elsewhere on the system is available for operation on either steam or compressed air.

NEWS OF ELECTRIC RAILWAYS

KEY ROUTE INAUGURATES PIER SERVICE

Company Entertains 150 Business Men at Luncheon on Newly-Finished Million Dollar Improvement

On May 21 the San Francisco-Oakland Terminal Railways routed all traffic to the ferry slips over the new 2-mile earth fill which has just been completed. Prior to the use of the new route by regular traffic, the company provided a special train on May 18 to take a party of representative business men of the city of Oakland over the pier. By leaving town in the late forenoon and serving luncheon on a ferry at the slip, the party returned to town with slight interference to business. About 150 accepted the invitation and many of these made personal expressions of appreciation at the end of the trip.

To give all those who participated in the trip facts about the work just completed, cards of convenient size were distributed bearing statistics relative to the new pier. These cards explained that work was started in June, 1913, to extend the solid fill into the bay the maximum distance permitted by the War Department. Two parallel walls of rock were dumped to provide a retaining wall for material dredged from the bottom of the bay. The rock walls were required to be built up to about 30 ft. above the bottom of the bay, and to accomplish this 626,000 tons of rock were used. As the rock walls were extended out from shore, the hydraulic fill was begun, and this has been continued steadily until a total of 2,500,000 cu. yd. has been filled in between the rock supports. The completed fill is 200 ft. wide, which is adequate for thirteen parallel tracks.

From the end of the solid fill to the ferry slip a new trestle 3800 ft. in length has been completed, so that with the inauguration of service over the new route, about 6000 ft. of the old double-track trestle will be abandoned. This does not include about 1000 ft. of the old trestle adjoining the ferry slip which will be preserved for stub tracks and general car storage. The approximate cost of the pier and new trestle, completely equipped ready for service, has been about \$1,250,000.

Under normal conditions there are now about 800 trains a day to the ferry slip. The new route is protected by automatic stops used in connection with automatic signals, of which there are eighty-one on the pier and trestle, these being spaced from 300 ft. to 450 ft. apart. The 3½ miles of main track involved is claimed to be the most densely signaled trackage in the United States.

ELECTRIFICATION OF ANOTHER IOWA ROAD PROPOSED

Plans are being considered for electrifying the Chicago, Anamosa & Northern Railroad and making it part of the Waterloo, Cedar Falls & Northern Railway. The road runs from Anamosa, Iowa, in a northwesterly direction through the towns of Jackson, Prairieburg, Coggon, Robinson, Monti, Kiene and ends at Quasqueton. It is 35 miles long. If it is made part of the system of the Waterloo, Cedar Falls & Northern Railway that company will build a connecting line from Quasqueton through Rowley to Brandon, Iowa, a distance of 15 miles, and will electrify the so-called C. A. N. This will add 50 miles to the system of the Waterloo, Cedar Falls & Northern Railway. The plan is being worked upon by the people along the line and the prospect of its being put through successfully is said to be good. The Chicago, Anamosa & Northern Railroad was a steam railroad. Its affairs have been in the hands of the United States courts for about two years, and since November, 1915, no trains have been operated over it. The property is to be disposed of at receiver's sale on July 11. The Waterloo, Cedar Falls & Northern Railway operates 135 miles of combined steam and electric railway. It is a standard gage line with 235 cars, eight electric locomotives and four steam locomotives.

EXPERIENCE ORDINANCE UNCONSTITUTIONAL

In the Marion Circuit Court, Indianapolis, Judge Ewbank has held to be unconstitutional a city ordinance requiring conductors and motormen, whether experienced or not, to receive thirty days' instruction from a man who has been in service on the lines of the Indianapolis Traction & Terminal Company for one year before he can be permitted to operate a street car in Indianapolis. This ordinance was passed by the City Council in 1914 at a time when the Indianapolis Traction & Terminal Company was seeking to restrain its employees from going on strike in violation of their working agreement with the company. No effort was made to enforce the ordinance until recently. The company's attorney attacked the ordinance as invalid, and cited decisions of the United States Supreme Court to support their arguments, saying that it gave no guarantee of competency. In his ruling, Judge Ewbank said:

"The reasoning by which the highest court in the country reached the conclusion that a statute which undertook to forbid any one from serving as a freight conductor without two years' previous experience as a freight brakeman, whatever his knowledge or proficiency in railroading or his previous experience as a trainman in the operation of trains, while not excluding anybody from serving as a freight conductor who had served two years as a freight brakeman, however lacking in education, knowledge or proficiency, was unconstitutional and void, leads irresistibly to the conclusion that this ordinance is also in conflict with the Constitution and void."

CITY LINE DEFIES UNITED RAILROADS

Eighteenth Street Crossing Installed by City of San Francisco Over Night

The completion of the Church Street extension of the Municipal Railway, San Francisco, Cal., has been delayed somewhat by the refusal of the United Railroads to permit the installation of the necessary crossing at Eighteenth Street, as was reported in the *ELECTRIC RAILWAY JOURNAL* of May 13, page 920. On advice of the legal department, however, the city engineer ordered the contractors to proceed with the work, and this was done on May 13 without apprising the company of the city's decision.

A crew of about fifty workmen started installing the crossing at 1 p. m. on Saturday, and the work continued through most of Saturday night. No preventative injunctions were presented by the private company and no attempt was made to obstruct the crossing. The work was completed before Sunday morning traffic was scheduled to start. Charles N. Black, vice-president and general manager of the United Railroads, is quoted in San Francisco newspapers as saying that no legal action would be taken in the matter at the present time. A question still to be settled, it is pointed out, is the cost of maintenance of the crossing. It is admitted that the burden of this can be thrust entirely upon the line which found the other tracks already installed, but thus far the United Railroads has not demanded its rights in similar cases. Since the completion of the Eighteenth Street crossing, the city has ordered the United Railroads to raise its track to official grade, the rails having been found to be 4 in. too low.

The Church Street line is to run from Sixteenth and Church Streets to Market, over Market to Van Ness, and thence down Market to the ferry, making it necessary to cross the United Railroads' tracks at three places. This work has already been ordered by the city, and was to have started on May 20. In commenting on the situation, M. M. O'Shaughnessy, city engineer, said that there will be no secrecy about crossing the Market Street tracks. When this work is started it is likely that the right of the Municipal Railway to cross and to parallel the United Railroads' tracks on Market Street will be tested in court.

WAR-TIME PRECAUTIONS TAKEN AT NIAGARA

The Dominion military authorities have ordered the construction of barbed wire entanglements in the Victoria National Park at Niagara Falls, Ont., in the vicinity of the power houses. Between Niagara Falls, Ont., and the Dufferin Islands and Chippewa, Ont., cars on the Park & River division of the International Railway will be escorted under armed guard. A machine gun has been mounted near the approach to the lower steel arch bridge under the command of the Ninety-eighth Royal Battalion, and barricades of sand bags have been thrown up around the tracks of the International Railway between Bridge Street station and the Whirlpool stopover. Fear of attempts by German sympathizers to cripple Canadian power plants and transportation facilities at Niagara Falls, Ont., is given as the reason for the precautions. Officials of the International Railway and the Great Gorge Route have been asked to cooperate with the Dominion military authorities to safeguard Canadian property, and armed soldiers, members of the next overseas contingent from Toronto and Hamilton, Ont., in the Niagara Falls concentration camps have authority to ride on all cars from Chippewa on the upper river to Queenstown, which is the lower terminus of the International Railway's Park & River division. The military restrictions and censorship have prevented the taking of any pictures of the barbed wire entanglements, machine guns, soldiers, etc., in action along the Canadian frontier guarding the railway property and the power houses.

SHORT STRIKE IN TRENTON

The trainmen in the employ of the Trenton & Mercer County Traction Corporation, Trenton, N. J., went on strike at midnight on May 18. Early on the morning of May 20 service was resumed, it having been agreed in the interim to arbitrate the questions at issue. There was no disorder and no attempt was made to operate cars during the short time that the men were out.

The week before the strike was declared the company discharged fourteen conductors charged with stealing. The men had been negotiating for new working conditions and more pay. The men discharged were in many cases, it is claimed, active in the union. The company denied that the activities of the men influenced it in the least. The men said that the company, if justified in discharging the men for the reason given, should have justified itself by taking the matter to the grand jury and having the men indicted for stealing.

A movement looking toward arbitration was begun the morning following the strike. It was first proposed that the City Commission arbitrate the matter, but this was changed so that only the preliminary arrangements were handled by the City Commissioners. The strikers will appoint an arbitrator, and the company will name a representative. These men will select a third, and they will form the board which, before July 1, will adjust the differences between the men and the company. The arbitration will be confined to passing upon the justness of the action of the company in discharging a number of conductors, including an officer of the union. The question of the terms of the new working agreement, to date from July 1, will be settled by direct conference between the representatives of the men and the officers of the company. Peter E. Hurley, general manager, has been selected to represent the company.

BUFFALO WAGE MATTERS ADJUSTED

An agreement has been reached between the International Railway, Buffalo, N. Y., and its employees whereby platform men will receive a wage increase of 3 cents an hour during the first two years of the three-year agreement and an additional cent in the last year. Other employees including barnmen, trackmen, etc., will receive a general increase of 13 to 14 per cent. The new scale has been accepted by the union by a vote of more than five to one. The company's first offer of a general increase of 2 cents an hour was rejected by the men, who demanded an increase of 8 cents an hour. An agreement has been reached on almost every other point at issue and a three-year agreement will be signed.

The increase will date from May 1 when the last three-year agreement expired. During the first two years of the agreement, new platform men will receive 26 cents an hour; second-year men, 27 cents; third-year men, 29 cents, and those who have worked four years and more, 34 cents. During the third year of the agreement each class of men will receive an additional cent. The Buffalo, Lockport and Niagara Falls city employees and the Buffalo & Niagara Falls, Buffalo & Lockport, Lockport & Olcott and Park & River divisions men will all benefit by the increase.

STANDARDS FIXED FOR GRADE-CROSSING SIGNALS

Plans for protecting grade crossings throughout the United States were adopted by the American Railway Association, at a recent meeting at the Biltmore Hotel, New York. The special committee on prevention of accidents at grade crossings was authorized to meet with a committee of the National Association of Railway Commissioners, and to join with them in recommending standards to be followed in the protection of grade crossings and to obtain legislation requiring compliance with such standards. The association adopted five specific standards, which will be recommended for adoption by public service commissions and other properly constituted authorities. These standards cover:

Uniform approach warning signs.

Uniform color of light for night indication.

Uniform use of a circular disk, approximating 16 in. in diameter, with the word "Stop" painted thereon in large letters, instead of the vari-colored flags which are now in use by crossing watchmen or flagmen.

Uniform painting of crossing gates with alternate diagonal stripes of black and white, "somewhat like a barber's pole."

Uniform rules governing crossing watchmen or flagmen while controlling or regulating street or highway traffic.

The report of the special committee that made these recommendations to the association stated that accidents at crossings have increased 1000 per cent in the last five years in some parts of the country. This was due largely to the increased use of the automobile. It was with the view of standardizing the crossing signals throughout the country, in order that automobile drivers might have ample warning when approaching a crossing that the association took steps to make warnings uniform for all States.

The circular disk, with the word "Stop" in large letters, with a contrasting background to make it stand out in bold relief, will eliminate the complaint that flags, which are now generally used, do not give the drivers sufficiently clear indication whether the flagman is urging them across the tracks or trying to stop them. This disk will be held up in the middle of the highway.

The "caution approach" sign will serve to remind drivers that there is a railway crossing 400 or 500 ft. ahead. At night the same color light will be used at all crossings, so that there may be no misunderstanding as to the meaning of such signals.

MR. DOHERTY MAY VISIT TOLEDO

It is possible that Henry L. Doherty will spend a few days in Toledo, Ohio, after the convention of the National Electric Light Association in Chicago, if his health will permit. Should he be able to do this, Mayor Milroy's street railway commission will probably hold daily sessions while he is in Toledo in order that all possible progress may be made on the new franchise.

Judge Ralph Emery, retained as the attorney of the commission, has found some faults in the rough draft of the proposition submitted by the commission. It is said that some of the provisions are in contravention of the State constitution and will have to be changed, but he has not yet been able to prepare a report on the matter.

Legislation was introduced in the City Council on May 22 which will clear Summit Street of all vehicular travel, except street cars, between 4.30 p. m. and 6.30 p. m.

References to other phases of the negotiations at Toledo are contained elsewhere in this issue.

NEW 100 000-KW. STATION FOR CONNECTICUT COMPANY

The Connecticut Company, New Haven, Conn., has awarded a contract to The J. G. White Engineering Corporation, New York, for the engineering and construction of a new steam power plant at New Haven. The plans for this power station are being prepared for an ultimate capacity of 100,000 kw. Construction work on the foundation for the plant will begin at once. This plant will take the place of the company's old direct current station at New Haven, and probably two substations will be built in New Haven for local distribution of current to the Connecticut Company's lines. The current generated by this new plant will be in addition to the electrical energy delivered to the Connecticut Company's lines by its other important stations, among which are those located at Waterbury, Bridgeport, Hartford and Berlin.

NEW PROCEDURE ADVOCATED IN TORT CASES

Figures collated by Judge William L. Ransom, of the City Court, show that the public service corporations in New York City charged to operating expenses during 1915 a sum approximating \$3,250,000 on account of payments and expenses in connection with tort claims. According to the *New York Times* the purpose of gathering these statistics was to prove that some better method was needed in determining the justice of such claims, and to prevent the submission of "expert" testimony that is often of such a character as to create the strongest suspicions of its honesty. After telling what injustice has grown out of the present system, and how much the injustice has indirectly cost the people, Judge Ransom made these suggestions, which he thinks will greatly reduce the total amount of claims paid each year without doing any injustice to those who have a real grievance against the corporations sued:

"1. Where an injury is sustained for which a public service corporation is claimed to be liable in tort, the injured person should be required to give written notice of injury and claim within a short period to the Public Service Commission and to the company, similarly to the notice required under the Workmen's Compensation act or in the case of tort claims against a municipality. It should then be the duty of the commission to investigate the physical circumstances of each such accident. This would tend mightily to eliminate fictitious and fraudulent claims of mishap and prevent the common misrepresentation of the physical surroundings. After suit is brought, the written reports made by the commission's investigators should be made available to both parties, but should not be evidence upon the trial. No such action should be permitted to be settled except upon order of court, made upon notice to the commission.

"2. Coming more directly to the topic of medical expert testimony, I believe that upon the service of such a notice of injury and claim, the injured person, the prospective defendant, or, in a case where a public service corporation is involved, the Public Service Commission should have the right, upon petition to the court, to obtain an immediate physical examination of the injured, by a physician selected by the court from a list of physicians authorized to make such examination. The list itself should be selected by the Appellate Division in each department, from among the physicians certified by the State Board of Regents to be eligible. Not less than 200 physicians should be designated in each metropolitan department. The State Board should, in my present judgment, certify to the respective Appellate Divisions the names of all resident physicians who (1) are graduates of colleges of good standing and rigorous requirements as to degrees, or can prove possession of equivalent knowledge, training and mental discipline; (2) are graduates of a medical school of good standing and adequate facilities, clinical and otherwise; (3) have been engaged in the general practice of medicine and surgery for upwards of five years; (4) have been engaged in some form of special study and practice for at least a year, either in laboratory investigation or hospital practice, or have shown qualifications by the authorship of a medical work of acknowledged value, by the holding of a teaching position in a medical school of recognized standing, or by membership in exclusive societies, devoted to the investigation and study of special branches of medical science.

"3. Either party should have the right to have his own physician or physicians present at such examination, but there should be no examination of a plaintiff at the instance of an adverse party except in connection with such an examination by a physician selected by the court. The court should be empowered to order a further examination by the same or by additional physicians, selected from the same list, upon showing of substantial reasons therefor."

City Officials Sued by Amalgamated.—Judge Dillon of the Common Pleas Court at Columbus, Ohio, has taken under advisement two suits filed by national organizers of the Amalgamated Association, asking that city officials be enjoined from alleged wrongfully interfering with their work in organizing a union among employees of the Columbus Railway, Power & Light Company. Each plaintiff asks \$10,000 damages from the city officials.

Bill of Particulars Demanded in Strike Suit.—An order has been granted by a Supreme Court justice requiring the International Railway, Buffalo, N. Y., to furnish a bill of particulars to the county of Erie in its suit to recover \$100,000 damages alleged to be due for the failure of the county to protect railway property during the strike three years ago. The company has another action of similar nature pending against the city. The railroad company by the terms of the court order is required to specify items of alleged damage and also to give names of persons who made alleged threats, etc.

Right to Proceed with Extension Case Granted.—According to a decision of the State Supreme Court, the Public Service Commission of Missouri may now proceed with the hearings of the petition of residents of North St. Louis that the United Railways be compelled to construct a street railway from the municipal docks at the foot of North Market Street to Broadway and thence to St. Louis Avenue and to the city limits. The Supreme Court denied a writ of prohibition filed by the United Railways to restrain the Public Service Commission from making the order asked for in the petition.

Stay Granted in Mill Tax Case.—The United States Supreme Court has made an order staying until June 1 the sending down of its mandate to the Missouri Supreme Court affirming its judgment against the United Railways, St. Louis, in the mill tax case. The attorney for the company explained that he had been given until June 1 to file a motion for a rehearing in the case, and the final order of the upper court was to be held back until this date. The recent decision of the United States Supreme Court adverse to the company was noted in the *ELECTRIC RAILWAY JOURNAL* of April 15, page 745.

Middlesex & Boston May Tear Up Line.—George M. Cox, vice-president and general manager of the Middlesex & Boston Street Railway, Newtonville, Mass., has advised Superintendent of Public Works Macksey of Woburn that if the Woburn City Council insists on the installation of granite paving blocks between the rails of the Pleasant Street line, the directors of the company will probably order the tracks removed. The street is being rebuilt by the town. Mr. Cox states that the directors cannot see their way clear to expend the sum of money necessary to comply with the order of the board.

Massachusetts Labor Conferences.—Officials of the Worcester (Mass.) Consolidated Street Railway and the Springfield (Mass.) Street Railway were to confer on May 25 at the office of Henry C. Page, general manager of the Worcester company, with representatives of the unions on the two properties, upon wages and working conditions. Employees of the Worcester & Warren Street Railway have submitted a request for a wage increase to the directors. Conferences with union representatives are continuing on the Boston Elevated Railway, looking toward the conclusion of a new agreement in due course.

Connecticut Wages Adjusted.—The trainmen in the employ of the Connecticut Company have approved the following wage scale: 26 cents an hour the first year of service, 27 cents the second year, 28 cents the third year, 29 cents the fourth year, 30 cents the fifth year and 32 cents thereafter. The men had asked for a scale which ran from 28 to 35 cents an hour. The new scale will be

in effect from June 1, 1916, to June 1, 1918. The conference board representing the men has also ratified the company's offer of a wage scale and new working terms for motormen and conductors on the lines of the New York & Stamford Railway.

Arguments in Toledo Contempt Case Concluded.—Lawrence Maxwell, counsel for the plaintiffs in error, and United States District Attorney E. S. Wertz, for the United States, have completed their arguments before the United States Circuit Court of Appeals at Cincinnati in the appeal of the Toledo Newspaper Company, publisher of the Toledo *News-Bee*, and its editor, Negley D. Cochran, from the decision of United States District Judge John M. Killits, who found against them in contempt proceedings in connection with the street railway litigation at Toledo. The suit grew out of cartoons and editorials which were published in the newspaper, criticising the United States District Court.

New Carhouse to Be Built at Springfield.—Work will be started at once upon the new Hooker Street carhouse of the Springfield (Mass.) Street Railway, to which reference has been made in these columns. The carhouse job, which will include new repair shop, storerooms, an assembly hall and locker room, barber shop and restaurant, will cost about \$250,000. It is hoped to complete it by Jan. 1, 1917. The carhouse proper will have a frontage of 205 ft. on Main Street and will have a depth of 190 ft. It will be one story in height and of brick and concrete construction, having a yard with storage and loop trackage facilities. It is also expected, within the above estimate, to remodel the present carhouse at Carew Street to a considerable extent.

Proposal Made for Financing Toledo Commission.—At a meeting of the street railway commission of Toledo, Ohio, on May 16, it was announced that John N. Willys, of the Willys-Overland Company, proposed to finance the work of the commission. N. D. Cochran and N. C. Wright, members of the finance committee, reported that provision would be made in the franchise to be formulated to reimburse Mr. Willys. It was reported at the meeting that Henry L. Doherty was still too ill to confer with the commission and that no progress can be made until a number of preliminary matters are discussed with him. It seems unlikely that any work of importance can be done until the latter part of June and perhaps later. In the meantime Judge Ralph Emery will report on a number of legal points involved in the plan which the commission is working out.

Washington Suburban Line Employees Strike.—Although the Washington & Old Dominion Railway, Washington, D. C., expressed its willingness to carry out the arbitration agreement in every way, the employees announced on the morning of May 12 that they would strike at 4 p. m. if the company did not comply with their renewed demands for increased wages, changes in working conditions and in hours of labor identical with the original demands, which were refused by the company. Temporary restraining orders in Washington and Virginia were obtained by the company against about 150 former employees to prevent interference with the company in the conduct of its interstate commerce and the carrying of United States mail. A hearing on this injunction was set for May 25. On May 20 W. B. Emmert, general manager, announced that cars were being run and many passengers carried. He also said a number of strikers had returned to work and that many others had taken advantage of the company's offer to consider applications of former employees.

Storm Damages Western New York Lines.—Western New York interurban lines, especially those operating in the southern tier of counties, were seriously affected by the series of cloudbursts following a continuous rainfall on May 13-15. Property damage estimated in excess of \$1,000,000 was done by the high water. The electric railways operating in Olean and those entering the city were forced to abandon regular schedules. Sections of track were washed away along the Western New York & Pennsylvania Traction Company's line and a concrete culvert was also destroyed. In some parts of the city the water was 16 ft. deep. No attempt was made to operate cars

on the line between Olean and Hornell owing to high water. In Batavia car service in West Main Street was stopped and boats were pressed into service. Two miles of tracks between Batavia and Attica were destroyed. The line between Perry and Silver Lake was washed out near Fairview and service was temporarily interrupted. At one time the water threatened to destroy the floodgates in the power race in Mount Morris. Laborers strengthened the gates with mud and sandbag embankments. The electrical storm which followed the cloudbursts temporarily crippled many of the small electric power plants feeding the interurban lines. The damage was confined exclusively to Cattaraugus, Chautauqua, Wyoming, Genesee and Allegheny counties and the southern part of Erie County. None of the lines operating out of Buffalo experienced difficulty.

PROGRAMS OF ASSOCIATION MEETINGS

Central Electric Railway Association

The committee in charge of the midsummer meeting and boat trip of the Central Electric Railway Association announces that a very large number of applications for reservation of staterooms and tickets have been received. The rule of "first come, first served" is being followed in assigning accommodations. The steamer *South American*, on which the trip will be made, has state rooms for 500 people. The steamer will sail from Toledo at 11 a. m., central time, on June 27. The tour will cover the route up the Detroit River, through Lake St. Clair and the St. Clair River, up Lake Huron to "The Soo" and through the St. Mary's River, then to Mackinaw Island for a half-day stop and then down Lake Michigan to Benton Harbor or Chicago. This is a trip of nearly 800 miles. The committee announces that a stop of an hour will be made in Detroit and that mail to be delivered at Mackinaw Island, Mich., should reach there early the morning of June 29. The party will disembark at Benton Harbor and Chicago on the afternoon of June 30. Reservations should be sent to John Benham, 15 South Throop Street, Chicago.

Arkansas Association of Public Utility Operators

The program has been announced for the meeting of the Arkansas Association of Public Utility Operators to be held at Little Rock, Ark., on June 6, 7 and 8. The session on June 6 will be begun at 2 p. m. The delegates will be welcomed by Mayor Charles E. Taylor of Little Rock. H. C. Couch, president of the association, will respond. The reports of the executive committee and of the secretary and treasurer will then be presented. Mr. Couch will then make his address as president. The program of papers of interest to electric railway operators is as follows:

JUNE 6

"Co-operation of Association Members for Mutual Benefit," by C. J. Griffith, general manager of the Little Rock Railway & Electric Company.

JUNE 7

"How to Obtain Proper Relation Between Employees and Company," by F. Law, manager of the Russellville Water & Light Company.

JUNE 8

"The Troubles of Central Station Operators and Their Remedies," by B. C. McKinnon, manager of the Eldorado Light & Power Company.

"Relation of Power Factor to Central Station Costs," by Fred Johnson, district manager of the Wagner Electric Company, St. Louis, Mo.

"Commercial Publicity," by W. F. Moody of the new-business department of the Arkansas Light & Power Company, Arkadelphia, Ark.

There will be a theater party at 8.30 p. m. on June 6. On June 7, at 3 p. m., there will be a Jovian rejuvenation. On the same day and at the same time as the rejuvenation there will be an automobile ride for the ladies. At 8 p. m. on June 7, the banquet of the association will be held at the Hotel Marion. Following the presentation of the paper by Mr. Moody on the afternoon of June 8, new officers will be elected for the association.

Financial and Corporate

ANNUAL REPORTS.

Hudson & Manhattan Railroad

The comparative income statement of the Hudson & Manhattan Railroad, New York, N. Y., for the calendar years 1914 and 1915 follows:

	1915		1914	
	Amount	Per Cent	Amount	Per Cent
Gross revenue—passenger fares.	\$3,477,695	93.3	\$3,490,880	93.1
Miscellaneous revenue from railroad operations:				
Advertising	\$121,149	3.2	\$150,689	4.0
Other car and station privileges	69,026	1.9	66,803	1.8
Sale of power	12,081	0.3	3,618	0.1
Miscellaneous transportation revenue	15,443	0.4	10,949	0.3
Other miscellaneous revenue ..	30,591	0.8	28,008	0.7
Total miscellaneous railroad revenue	\$248,293	6.6	\$260,069	6.9
Total railroad revenue	\$3,725,989	100.0	\$3,750,950	100.0
Operating expenses of railroad:				
Maintenance of way and structures	\$269,424	7.2	\$260,801	6.9
Maintenance of equipment	179,676	4.8	159,256	4.2
Power	243,508	6.5	245,478	6.5
Transportation expenses	615,302	16.5	622,485	16.6
Traffic expenses	1,110	0.6	1,625	0.1
General expenses	147,573	4.0	157,692	4.2
Total operating expenses of railroad	\$1,456,595	39.1	\$1,447,339	38.6
Net operating revenue from railroad	\$2,269,393	60.9	\$2,303,610	61.4
Taxes on railroad operating property	272,237	7.3	251,205	6.6
Net income from railroad operation	\$1,997,156	53.6	\$2,052,405	54.8
Net income from outside operations	982,627	26.4	997,270	26.5
Total income from all operating sources	\$2,979,783	80.0	\$3,049,676	81.3
Non-operating income	43,111	1.1	28,627	0.7
Gross income	\$3,022,895	81.1	\$3,078,304	82.0
Income deductions prior to bond interest	243,765	6.5	236,790	6.3
Net income applicable to bond interest	\$2,779,130	74.6	\$2,841,513	75.7
Bond interest on N. Y. & J. 5's, first mortgage 4½'s and first lien refunding 5's	2,137,998	57.4	2,121,007	56.5
Balance of net income available for interest on adjustment income bonds	\$641,132	17.2	\$720,506	19.2

During the last calendar year the company suffered a slight loss of \$13,185, or 0.3 per cent, in gross revenue from railroad operation, this arising mostly from decreases in passenger revenue and advertising revenue. The railroad operating expenses (including depreciation) showed an increase of \$9,256, or almost 0.7 per cent, and taxes increased \$21,032, or 8.3 per cent, so that the railroad income decreased \$55,249, or 2.6 per cent. The increase in operating expenses arose mostly from higher expenditures for maintenance of way and structures and equipment, with decreases in the other items. After taking in the decreased net income from the Hudson Terminal Buildings and other outside operations and the increased non-operating income, the gross income applicable to fixed charges showed a loss of \$55,409, or 1.8 per cent for the year, and the small increase in income deductions other than bond interest raised the loss in net income applicable to bond interest to \$62,383 or 2.2 per cent. The balance of net income for the period available for interest on the adjustment income bonds was less by \$79,374, or 11.0 per cent, than in 1914.

From January to September the passenger traffic showed decreases as compared with the same months in 1914, but it is noted that the traffic of the company had shown a normal growth prior to August, 1914, when the European war broke out. Since the full effects of the war did not

begin to operate against the company's business until Sept., 1914, it was not until Oct. 1, 1915, that significant comparisons in traffic could be made. Since this time, the business of the company has shown such satisfactory increases as almost to overcome the decreases of the prior months of 1915. Beginning with October, the traffic over the uptown lines showed increases for the first time since the installation of the 7-cent fare.

The following table gives some comparative traffic statistics for the last two calendar years:

Number of passengers carried.....	59,915,192	59,900,257
Number of passengers carried per mile of road.....	7,048,846	7,047,089
Number of passengers per revenue car-mile	7.68	7.54
Passenger revenue per mile of road..	\$409,140	\$410,691
Gross railroad operating revenue per mile of road.....	438,351	441,288
Operating expenses (excluding taxes) per mile of road.....	171,364	170,275
Net railroad operating revenue per mile of road.....	266,987	271,013
Passenger revenue per revenue car-mile	\$0.4456	\$0.4393
Gross railroad operating revenue per revenue car-mile	0.4774	0.4720
Operating expenses (excluding taxes) per revenue car-mile.....	0.1866	0.1821
Net railroad operating revenue per revenue car-mile	0.2908	0.2899
Passenger revenue per passenger....	\$0.0580	\$0.0583
Gross railroad operating revenue per passenger	0.0621	0.0626
Operating expenses (excluding taxes) per passenger	0.0243	0.0242
Net railroad operating revenue per passenger	0.0378	0.0384

Westinghouse Electric & Manufacturing Company

The income statement of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., for the fiscal year ended March 31, 1916, follows:

Gross earnings, sales billed.....	\$50,269,239
Cost of sales—factory cost, including depreciation...	40,839,344
Net manufacturing profit.....	\$9,429,895
Other income	1,106,730
Gross income	\$10,536,625
Deductions from income.....	869,837
Net income available for dividends.....	\$9,666,788

The sales billed and the net income for the year were in excess of the results for any previous year in the company's history. In 1915 billed sales totaled \$33,671,485 and net income \$2,009,744. The increase was due partly to munition orders, the shipments of which totaled \$8,578,266. The total orders for war munitions booked by the company, its proprietary companies and the Westinghouse Machine Company amounted to approximately \$96,527,000. These orders included firm orders, orders subject to cancellation for undelivered goods upon the payment of an agreed profit, and orders subject to cancellation upon three months' notice to stop work. Nearly all of the work upon war munitions is being carried on at plants constructed or acquired especially for this class of business, and thus does not interfere with the regular output.

The value of orders received during the year, exclusive of orders for war munitions, was \$58,218,171, and the value of unfilled orders as of March 31, 1916, for the regular products was \$22,097,995, as compared with \$5,464,965 at the same date of last year. (The value of unfilled orders as stated in the report of March 31, 1915, included \$3,486,445 for war munitions.) During the early part of the year the East Pittsburgh works were operating considerably below their capacity, but the regular business has increased so that they are now operating at full capacity on regular products.

The surplus at the close of last year was \$7,473,411, which was increased during the year by net income and other credits to \$17,166,496. Dividends were paid upon the preferred stock at 7 per cent per annum and the common stock at 4 per cent per annum for the first quarter and at 6 per cent per annum for the remaining three quarters. "Deferred charge for expenses" in connection with the bond issues of 1906 and 1915, which had been carried in suspense, has now been entirely written off, the amount being \$1,080,266. "Patents, charters and franchises" have been reduced by \$1,894,057 and that amount charged against sur-

plus. For the purpose of eliminating all items in the nature of good-will, the amount of \$1,875,000, heretofore included in "Investments" and representing the excess of book value over the par value of the capital stock of the Perkins Electric Switch Manufacturing Company, has been written off against surplus. At the end of the present year the remaining surplus was \$9,246,707.

OPTION TAKEN ON DALLAS PROPERTIES

United Electric Securities Company Is Considering Purchase Upon Basis of City Co-operation

At the request of the United Electric Securities Company Stone & Webster have given an option on their holdings in the Dallas traction, lighting and terminal properties. The United Electric Securities Company will exercise this option and take over the interests of Stone & Webster only in case Dallas people will participate with them both in the reorganization and in the financing and management of these public utility properties under acceptable franchises.

If this option is exercised, the Dallas Electric Corporation, the holding company, organized under the laws of the State of Maine, will be dissolved; the Consolidated, Metropolitan and Rapid Transit traction lines will be merged in a new local company to be organized under the laws of Texas, and it is expected that this company will acquire, by lease or in some other way, the local Oak Cliff lines and operate them as a unit with the Dallas traction lines; the lighting and power properties will be separated from the traction properties and will be reorganized, owned and operated by a local Texas company.

J. F. Strickland, Dallas, and his associates have expressed a willingness to co-operate in the financing and reorganization of the light and power company, and to undertake its management. No definite plans have been formed as to the traction lines, and none will be until after the arrival of J. A. Trawick, vice-president of United Electric Securities Company. In the event the above plans cannot be worked out with the city authorities and the local people the United Electric Securities Company will not exercise its option to purchase.

It was later announced that Charles W. Hobson, president of the Southwestern General Electric Company, would head the local corporation which is planned to take up the task of reorganizing the street railway system of Dallas and that Mr. Strickland would be in executive charge of the electric light and power properties which will be placed under a separate corporation from the street railways. It was also stated that steps would shortly be taken to secure modifications of the traction and light franchises adopted at the election on April 4. In the meantime, work along the lines of financial and operating reorganization of the properties will be carried on.

CITIES SERVICE TO INCREASE CAPITALIZATION

A special meeting of the stockholders of the Cities Service Company, New York, N. Y., has been called for June 29, at which time the stockholders will be asked to approve an increase in the authorized capitalization of the company from \$65,000,000 to \$100,000,000. The increase is to be from an authorized \$40,000,000 of preferred stock to \$60,000,000, and from an authorized issue of common stock of \$25,000,000 to \$40,000,000.

The former contract having expired, the Cities Service Company has entered into a new contract with Henry L. Doherty & Company by which it will pay in cash only the actual expenses incurred in the management and operation of these properties, but as further compensation the Cities Service Company has given to Henry L. Doherty & Company an option on \$3,000,000 of common stock at \$225 a share, and also the right to purchase at \$250 a share one-third of all other common stock which may be issued in the next five years. This contract provides that in consideration of the granting of these options Doherty & Company agree to turn over to the Cities Service Company all their present public utility properties and to conduct all operations in the public utility properties and oil properties in behalf of the Cities Service Company, and that Doherty & Company shall have the right to take up and operate for

their own account or for other parties only such properties as have first been offered to the Cities Service Company at cost and their purchase declined by that corporation.

In addition to the regular annual rate of 6 per cent in cash, beginning Aug. 1, 1916, the Cities Service Company will also pay 2 per cent on the common stock in common stock on Sept. 1 and an additional 4 per cent in common stock on Dec. 1. The board also expects to pay 6 per cent in common stock in 1917 and thereafter to increase the dividends paid in common stock 3 per cent each year so long as earnings of the company justify this policy.

The directors have voted to make an offer to the stockholders of the Toledo Traction, Light & Power Company to take over their holdings of preferred and common stocks at approximately their present market prices. The same offer will also be made to the stockholders of the Lincoln Gas & Electric Light Company and to those of the Montgomery Light & Water Power Company. An offer will also be made to the holders of the preferred stock of the Electric Bond Deposit Company by which they may exchange their stock share for share for preferred stock of the Cities Service Company.

BOSTON ELEVATED SEEKS FINANCIAL AID

Appeals to Governor for Commission to Examine Need for Increased Net Revenue

In a letter addressed to Governor McCall of Massachusetts on May 22 and signed by Henry S. Lyons, secretary for the board of directors, the Boston Elevated Railway appealed for the appointment of a recess commission to report to the next Legislature whether the State should take any action with a view to enabling the company to obtain a net revenue adequate for its corporate and public purposes. The letter set forth that at present the company is unable to obtain the additional capital necessary to equip the tunnels and rapid transit lines under construction and to make other additions and improvements for the reason that it has already issued the amount of bonds allowed by the law and is unable to sell its stock at par, which is the minimum price required by law. The letter also stated that the results of the present fiscal year have confirmed the opinion previously expressed and held by the company, that with the present rate of fare which it is permitted to charge, the transfer privileges which it is compelled by its charter to grant, the rentals for subways already constructed and in process of construction, and the other burdens and charges to which it is subject, it will be impossible for the company to continue to raise capital required to provide additions and improvements to the property, entirely apart from the ability to earn a reasonable return on the money invested. Unless some other remedy looking toward radically increased net revenue is provided it is absolutely necessary that some modification be made in the company's existing contract with the State. Reference was made in the communication to the investigation reported by the Public Service Commission to the Legislature on April 9, 1915. The Governor has sent a special message to the Legislature recommending the establishment of a commission composed of the Public Service and the Boston Transit Commissions, and additional members to conduct the desired inquiry.

CONSOLIDATION OF UTAH LINES PROPOSED

Negotiations are under way for the merger of the three corporations now operating electric lines in Utah and southern Idaho. The railroads involved are the Bamberger line (the Salt Lake & Ogden), the Orem line (the Salt Lake & Utah) and the Ogden, Logan & Idaho Railway. These three companies, some time ago, appointed the same operating officials for each of the lines. A consolidation of the corporations would give the new company control of a continuous line from Preston, Idaho, the northern terminus of the Ogden, Logan & Idaho line, to Payson, Utah, the southern terminus of the Orem line, a distance of 213 miles. The three companies together have \$9,500,000 of stock outstanding and about \$15,000,000 of bonds. Emil G. Schmidt, president of the Des Moines (Iowa) City Railway, and F. C. Chambers, electrical engineer of the company, are understood to have inspected the properties in the interest of capital which has under consideration the matter of participating in the merger.

American Cities Company, New York, N. Y.—The gross earnings from all sources of the combined constituent companies of the American Cities Company for the calendar year 1915 amounted to \$14,203,898, a decrease of \$618,207, or 4.2 per cent as compared to the 1914 results. The operating expenses and taxes totalled \$9,171,021, an increase of \$37,439, or 0.3 per cent, so that the net earnings at \$5,032,877 represented a decrease of \$655,646, or 11.5 per cent. The deductions from income totalled \$3,651,442, an increase of \$170,469, or 4.9 per cent, thereby making a decrease of \$826,115, or 37.4 per cent, in the \$1,381,435 of income applicable to dividends on stock. The decrease in gross earnings was caused entirely by the general business depression and jitney competition, both of which conditions were only temporary, as was shown by the increased earnings in the last three months of the year effected by the adjustment of business conditions and the regulation of jitney competition.

Central Park, North & East River Railroad, New York, N. Y.—In sustaining a decree of the lower court, Judge Buffington, in the United States Court of Appeals, at Philadelphia, Pa., has dismissed the suit of Richard B. Kelly, New York, against George W. Elkins and the estates of P. A. B. Widener and Thomas Dolan. Mr. Kelly was a minority stockholder in the Central Park, North & East River Railroad, a subsidiary of the Metropolitan Street Railway. He alleged that the defendants, directors of the company in which he was a stockholder, had wasted more than \$2,000,000 of the assets of the company. The action in this case was referred to in the *ELECTRIC RAILWAY JOURNAL* of Jan. 16, 1915; March 13, 1915, and Dec. 18, 1915.

Choctaw Power & Light Company, McAlester, Ohio.—The Choctaw Power & Light Company has filed articles of incorporation under the laws of the State of Maine with a capital stock of \$2,500,000, presumably as the successor to the Choctaw Railway & Lighting Company, the property of which was sold under foreclosure on April 8, as noted in the *ELECTRIC RAILWAY JOURNAL* of April 15, page 752.

Cincinnati, Dayton & Toledo Traction Company, Hamilton, Ohio.—Application for the appointment of a receiver for the Cincinnati, Dayton & Toledo Traction Company was filed in the Common Pleas Court of Butler County, Ohio, on May 12 by Albert D. Alcorn, Cincinnati. Mr. Alcorn alleges that he holds five \$1,000 bonds of the company on which the interest has been overdue for some time. He says that the board of directors of the company has taken no steps to protect the bondholders, since it has allowed the Ohio Electric Railway to continue to operate the road, although in default for the payment of its rent. He asks that the company be enjoined from turning over its affairs and property to the bondholders' committee. A three-day conference between Randall Morgan, head of the syndicate which controls the Ohio Electric Railway, and the bondholders' committee had just been concluded in Cincinnati at the time Mr. Alcorn presented his petition. J. M. Hutton, chairman of the committee, made the following statement: "There have been a number of conferences, but no conclusions have yet been reached. There are problems in the future requiring large sums of money, such as expenditures to connect with the loop, conservation plans and the maturing of underlying first mortgages, one of which falls due in July. These matters will all require a good deal of consideration and some time to solve." The company has filed an answer to the petition of Mr. Alcorn in which it makes a general denial of the allegations set forth. Some months ago a proposal was made to the company for the modification of the lease under which the road is operated by the Ohio Electric Railway. The likelihood was also reported at one time of the committee representing the bondholders reorganizing the company with the end in view of having the company operate its own line.

Columbus Railway, Light & Power Company, Columbus, Miss.—Interests headed by R. T. Fant, Memphis, Tenn., are reported to have acquired the property of the Columbus Railway, Light & Power Company. It is stated that Mr. Fant has been elected president, succeeding C. F. Sherrod. Charles Hayes is to continue as superintendent.

Denver (Col.) Tramway.—F. W. Hild and John W. Morey have been elected directors of the Denver Tramway, succeeding J. A. Beeler and Thomas F. Keely. Mr. Hild is general manager of the company.

Detroit (Mich.) United Railway.—The Detroit United Railway has notified the holders of the first consolidated mortgage 5 per cent gold bonds of the Detroit Electric Railway, numbered 1 to 1000, both inclusive, that they fall due and will be paid on presentation at the office of the Central Trust Company, New York, N. Y., on June 1, 1916.

Kansas City (Mo.) Railways.—The board of directors of the Kansas City Railways met on May 22 in Kansas City. Ford Harvey, formerly one of the receivers of the Metropolitan Street Railway, and Frank Hagerman, attorney for the receivers, resigned as company directors. Their places were filled by the election of J. E. Gibson, general manager of the company, and Clyde Taylor, general counsel. The other company directors are P. J. Kealy, C. W. Armour, R. J. Dunham and E. F. Swinney. The five city directors are W. T. Kemper, John H. Wiles, F. C. Niles, D. M. Pinkerton and John W. Wagner. The board will hold regular meetings the first Wednesday of each month.

Lancaster & York Furnace Street Railway, Millersville, Pa.—The reorganization of the Lancaster & York Furnace Street Railway has been completed. The bondholders, who took the property from the receivers' hands, have chosen the following directors: Paul Heine, Dr. A. B. Bausman, Eli G. Reist, Elam H. Myers, J. W. Gardener, J. B. Harnish, Amos M. Landis and Martha H. Davis. The board organized by electing Paul Heine president; J. B. Harnish, vice-president; Elam H. Myers, treasurer; John H. Myers, secretary; John H. Ware, general manager. The road has resumed operations, after having been closed since early last January.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—The Mahoning Valley Railway has been authorized to issue \$117,181 of its improvement and refunding mortgage bonds and deliver them to the Mahoning & Shenango Railway & Light Company in payment, at par, for advances made by it for the construction of additions, extensions and improvements from Nov. 1, 1915, to March 31, 1916.

Metropolitan Street Railway, Kansas City, Mo.—Ford F. Harvey has been discharged by Judge William C. Hook of the United States Circuit Court at Kansas City, as one of the receivers of the Metropolitan Street Railway. Herman Brumback has also been discharged as special master. Robert J. Dunham remains as receiver to close up such business as still remains under the receivership. A change in the board of directors of the successor company, the Kansas City Railways, is published above.

Mexico (Mex.) Tramways.—The New York office of the Pearson Engineering Corporation reports that the relations between the Mexico Tramways and the Mexican interventionists, who took over the operation of this property in October, 1915, are of a very pleasant and satisfactory nature.

New Orleans Railway & Light Company, New Orleans, La.—Bertron, Griscom & Company, New York, N. Y., Reilly, Brock & Company, Philadelphia, Pa., and the Hibernia Bank & Trust Company, New Orleans, La., have bought from the New Orleans Railway & Light Company \$3,250,000 of refunding and improvement 5 per cent bonds and \$3,250,000 of two-year 6 per cent notes. The proceeds will be used to pay off maturing notes amounting to \$4,000,000 and to buy \$1,000,000 of the company's French series of refunding and improvement bonds, as well as supply funds for improvements. The new notes are being offered at par and interest.

Philadelphia Company, Pittsburgh, Pa.—Holders of the 5 per cent preferred stock of the Philadelphia Company are to receive further opportunity to exchange their holdings share for share for 6 per cent cumulative preferred stock up to and including July 15 upon payment of \$3 per share, subject to the adjustment of the dividends as of the date of deposit of the 5 per cent preferred stock.

Pittsburgh (Pa.) Railways.—The United Traction Company has answered in the District Court of the United

States at Pittsburgh the application for a receiver for the company, asked for by Charles E. Estlack, Woodbury, N. J., on behalf of himself and all other preferred stockholders. The company denied that the Philadelphia Company and the Pittsburgh Railways have failed to keep the property in proper operating condition. On the contrary, the answer says "the property of the United and its subsidiary companies is in better condition now than it was at the time of the making of the operating agreement." It is denied that the net earnings of the United Traction Company were large enough to pay fixed charges, a dividend of 5 per cent upon the preferred stock, and to show a surplus to the credit of the company, if the charges, which were properly charges of maintenance, had been so made, and if reserves had been properly set up for injury and damage claims not settled, and for depreciation and obsolescence. It is averred that under the methods which prevailed at that time of keeping the books of a public service corporation, charges were made to capital account which the companies are now compelled to pay to maintenance or against reserves set aside out of the earnings, and, while the directors and officers of the company followed the usual custom in their methods of keeping the books, such method is not now followed.

Public Service Corporation of New Jersey, Newark, N. J.—The gross increase in total business of the Public Service Corporation of New Jersey for April, 1916, was \$369,992, or 12.8 per cent, as compared to April, 1915. The balance available—after payment of operating expenses, fixed charges, sinking fund requirement, etc.—for amortization, dividends and surplus was \$350,037, and the increase in surplus available for dividends was \$84,322. For the four months ended April 30, 1916, the gross increase in total business amounted to \$1,599,234, a percentage of increase of 13.6 per cent. The balance available for amortization, dividends and surplus was \$1,562,965, and the increase in surplus available for dividends totaled \$387,879.

Seattle, Renton & Southern Railway, Seattle, Wash.—Scott Calhoun and Joseph Parkin, receivers of the Seattle, Renton & Southern Railway, have recommended to Superior Judge A. W. Frater that the bid of F. J. Carver, an attorney representing undisclosed clients, be accepted for the property. Mr. Carver submitted a bid to the court on May 12. His proposal to the bondholders and creditors is to assign their claims to his clients, who will subscribe \$375,000 in cash for the present needs of the road, exchanging second mortgage bonds with the present bondholders, and preferred stock with the common creditors, his clients to retain the first mortgage bonds and the common stock, so that they may operate the property. A certified check for \$10,000 has been deposited with the receivers of the line by Mr. Carver. Judge Frater has fixed May 25 as the date for confirming the sale. The court will then decide whether the bid of \$1,200,000, the minimum price set by it for the property, made by clients of Attorney Carver, or the same amount bid by clients of John C. Higgins, representing Peabody, Houghteling & Company, will be accepted.

Southern Public Utilities Company, Charlotte, N. C.—E. H. Rollins & Sons, New York, N. Y., are offering for subscription at 97 and interest, to yield more than 5.20 per cent, \$900,000 of Southern Public Utilities Company first and refunding mortgage 5 per cent bonds due on July 1, 1943. A statement of earnings of the company for the year ended March 31, 1916, shows as follows: Gross income, \$1,645,965; operating expenses and taxes, \$986,580; net income, \$659,385; interest on \$5,488,500 of outstanding bonds, \$278,420; surplus, \$380,965.

West Penn Traction Company, Pittsburgh, Pa.—An extra dividend of 2½ per cent has been declared on the \$6,500,000 of preferred stock of the West Penn Traction Company on account of accumulated dividends along with the regular quarterly 1½ per cent dividend. Both dividends are payable on July 15 to holders of record of July 1. The quarterly dividends on the preferred stock, beginning with the Oct., 1914, to and including the Jan. 1, 1916, payments, were deferred. Quarterly distributions were resumed on April 15, 1916, when one-half of 1 per cent extra was paid on arrears.

DIVIDENDS DECLARED

American Railways, Philadelphia, Pa., quarterly, 1 per cent, common.
 Northern Ohio Traction & Light Company, Akron, Ohio, quarterly, 1¼ per cent, common.
 Northern Texas Electric Company, Fort Worth, Tex., quarterly, 1 per cent, common.
 West Penn Railways, Pittsburgh, Pa., quarterly, 1¼ per cent, preferred.
 West Penn Traction Company, Pittsburgh, Pa., quarterly, 1½ per cent, preferred; 2½ per cent on account of accumulated preferred dividends.

ELECTRIC RAILWAY MONTHLY EARNINGS

BATON ROUGE (LA.) ELECTRIC COMPANY						
Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income	
1m., Mar., '16	\$16,199	*\$8,999	\$7,200	\$3,461	\$3,739	
1 " " '15	14,853	*9,028	5,825	2,088	3,737	
12 " " '16	197,636	*106,935	90,701	30,989	59,712	
12 " " '15	180,222	*112,592	67,630	25,034	42,596	
BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.						
1m., Mar., '16	\$7,097	*\$8,466	†\$1,369	\$1,101	†\$2,470	
1 " " '15	7,006	*6,854	152	1,135	†983	
12 " " '16	116,967	*98,618	18,349	13,384	4,965	
12 " " '15	122,452	*101,311	21,141	13,345	7,796	
CAPE BRETON (N. S.) ELECTRIC COMPANY, LTD.						
1m., Mar., '16	\$27,866	*\$19,940	\$7,926	\$6,451	\$1,475	
1 " " '15	23,495	*15,666	7,829	6,543	1,286	
12 " " '16	371,850	*215,629	156,221	78,780	77,441	
12 " " '15	344,248	*209,008	135,240	78,123	57,117	
CITIES SERVICE COMPANY, NEW YORK, N. Y.						
1m., April, '16	\$638,491	\$20,670	\$617,821	\$41,631	\$576,190	
1 " " '15	342,336	15,298	327,038	40,333	286,205	
12 " " '16	5,591,248	195,589	5,395,659	500,166	4,895,493	
12 " " '15	3,946,538	137,607	3,808,931	466,666	3,342,265	
COLUMBUS (GA.) ELECTRIC COMPANY						
1m., Mar., '16	\$66,735	*\$28,272	\$38,463	\$28,705	\$9,758	
1 " " '15	55,582	*26,186	29,396	28,791	605	
12 " " '16	752,394	*328,458	423,936	344,242	79,694	
12 " " '15	690,773	*307,168	383,605	336,079	47,526	
DALLAS (TEX.) ELECTRIC COMPANY						
1m., Mar., '16	\$159,828	*\$100,143	\$59,685	\$36,779	†\$24,906	
1 " " '15	144,815	*89,420	55,395	33,428	21,967	
12 " " '16	1,851,642	*1,140,849	710,793	414,454	†303,539	
12 " " '15	2,110,020	*1,204,413	905,607	390,933	514,674	
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.						
1m., Mar., '16	\$62,339	*\$34,888	\$27,451	\$8,867	\$18,584	
1 " " '15	52,189	*31,984	20,205	8,772	11,433	
12 " " '16	761,575	*398,230	363,345	105,630	257,715	
12 " " '15	670,976	*391,985	278,990	103,352	175,637	
EL PASO (TEX.) ELECTRIC COMPANY						
1m., Mar., '16	\$86,491	*\$47,940	\$38,551	\$4,810	\$33,740	
1 " " '15	78,329	*45,189	33,140	4,229	28,911	
12 " " '16	1,014,837	*531,703	483,134	51,960	431,174	
12 " " '15	1,020,917	*559,699	461,218	50,671	410,547	
FORT WAYNE & NORTHERN INDIANA TRACTION COMPANY, FORT WAYNE, IND.						
1m., Mar., '16	\$141,317	\$85,871	\$55,446	\$54,620	†\$943	
1 " " '15	138,953	80,786	58,167	54,527	†4,049	
3 " " '16	420,091	251,244	168,847	161,964	†7,490	
3 " " '15	430,341	244,035	186,306	160,613	†26,729	
KENTUCKY TRACTION & TERMINAL COMPANY, LEXINGTON, KY.						
1m., Mar., '16	\$65,682	\$35,789	\$29,893	\$20,525	†\$13,147	
1 " " '15	58,707	33,184	25,523	19,324	†9,564	
9 " " '16	640,014	327,853	312,161	183,560	†149,351	
9 " " '15	608,578	325,154	283,424	177,994	†129,497	
HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.						
1m., Mar., '16	\$27,190	*\$14,692	\$12,498	\$5,357	\$7,141	
1 " " '15	21,698	*13,056	8,641	5,456	3,185	
12 " " '16	292,373	*162,348	130,025	68,259	63,766	
12 " " '15	269,990	*177,430	92,560	66,885	25,675	
JACKSONVILLE (FLA.) TRACTION COMPANY						
1m., Mar., '16	\$54,731	*\$36,762	\$17,969	\$15,440	\$2,529	
1 " " '15	53,497	*37,426	16,071	15,645	426	
12 " " '16	612,704	*426,044	186,660	180,181	6,479	
12 " " '15	688,368	*463,722	224,646	156,621	68,025	
VIRGINIA RAILWAY & POWER COMPANY, RICHMOND, VA.						
1m., Mar., '16	\$474,338	\$224,588	\$249,750	\$148,099	†\$108,404	
1 " " '15	399,491	202,889	196,602	138,037	†65,021	
9 " " '16	4,206,648	1,967,998	2,238,650	1,301,756	†1,008,393	
9 " " '15	3,860,783	1,858,867	2,001,916	1,225,583	†836,154	

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

Traffic and Transportation

CASE AGAINST JITNEY STATED

Newspaper Shows Forcefully How Jitney Reacts to Railway Patrons' Disadvantage

The case against the jitney was stated forcefully in the Scranton (Pa.) edition of the Elmira (N. Y.) "Telegram" of May 21. The article follows, substantially in full:

"Do you know that every time you ride in a jitney you are striking at the street railway transfer and giving a blow to the people who live in one side of the city and work in the other side? The street railway transfer is the one big drawback in the management of modern street railways. It is a condition of the past that does not exactly fit into conditions brought about through modern street railroading. The street railway companies would give a great deal to abolish the transfer, for the reason it would add more than 33 per cent to their daily earnings. A quarter of a century ago, when street railway men worked for 10 and 12 cents an hour and railway equipment did not cost one-half of what it does to-day, in order to humor councilmen who granted street railway franchises, the companies were liberal with transfers and such were put in the contracts. The street railway could afford to issue transfers years ago, for few people lived very far away from their labors. But now a man living in Dunmore may be employed in Keyser Valley, and he is carried 5 or 6 miles for 5 cents. Similar conditions exist in several parts of the city. The street car companies find little profit in the long haul, and they would be very glad to abandon it. But to break the contract the street railway company must have a valid and a convincing proof.

"The Pittsburgh Railways has issued notice that it will go before the Council and ask the privileges of increasing fares under certain conditions. The company says it is forced to do this to keep out of bankruptcy, as the recent advance in wages to employees has added \$500,000 a year to the pay roll. The Pittsburgh company wants to charge 10 cents for all fares after midnight. It also wants to cut off a number of transfer privileges. In other words the people of Pittsburgh will have to pay the increase in wages received by the street railway men, just as the consumer will pay for the advance in wages received by the miners.

"As I have said, the company would be very much pleased to get rid of the transfer. It is not only dead loss, but it requires a lot of clerical work that otherwise would be unnecessary. When the company goes before Council and shows that it cannot meet operating expenses, owing to the competition of the jitney, and that many people do not appreciate the transfer privileges, Council will have facts that cannot be overcome with ease, and sooner or later the Council will be forced to enter into some compromise with the company to permit it to meet its pay roll and the interest on its bonds. The result will be that this Council or some other Council will permit the street railway to abandon the transfer. This will add to the burden of the working people. It will mean a dime where a nickel pays the price to-day.

"Who is to blame? The jitney and the people who patronize it—the thoughtless people who do not understand what they are bringing about. It is said the Scranton Railway is losing \$500 and \$600 a day through the jitneys. The street railway pays the city \$10,000 a year for the use of the streets. The jitney does not pay the city a cent. The street railway has spent millions of dollars to lay pavement. The only contribution the jitney has for the city is the wear and tear of the streets, the congestion of traffic and the added danger to pedestrianism. The jitney is a pirate. It refuses to obey a city ordinance passed a year ago, requiring each jitney owner to furnish a bond sufficient to cover any damages he may do to persons in or out of his car. The jitney refuses to obey the ordinance forbidding more than the seating capacity of the car. The local courts have declared the ordinance constitutional. The jitney people have taken an appeal to the Supreme

Court, which will give them another year to help kill the street railway transfer. Many of the jitney owners belong to other towns, men who have never paid a cent towards the taxation of Scranton and yet come to Scranton and take possession of the streets that have cost us millions of dollars. The Public Service Commission, paid to look after the care of people, drags along as if its purpose was to give street railways the opportunity to go before Council and seek the privilege to withdraw street railway transfers. If you are going to give the jitney the right to collect 5 cents for the short haul, you are giving the street railway the food it wants to set aside a contract that is in favor of the people.

"The street railway employs 500 or 600 people in Scranton, paying union wages. The jitneys employ no one. The street railway employs union labor. The jitney people are not unionized. Sixty-five per cent of the nickel you give the street railway conductor goes to the labor of this city. A hundred per cent of the nickel you give the jitney man goes, in many instances, outside the city."

BAY STATE FARE HEARINGS GOING FORWARD

At the hearing on May 16 at Boston in the Bay State Street Railway fare case the cross-examination of R. M. Feustel, the company's valuation expert, was resumed by Arthur G. Wadleigh, counsel for the city of Lynn. It was brought out that the company's total revenue for the year ended June 30, 1915, was \$8,819,633, the maximum revenue being \$961,932 in July, 1914, and the minimum \$588,256, in February, 1915. The average monthly revenue was \$734,969. The witness said that the heavier summer business was largely of the all-day riding character. Some opportunity existed for borrowing equipment from other divisions than those handling the maximum loads. In regard to park and similar special rate tickets the point was made that these were omitted in the establishment of the proposed rate schedule.

Mr. Feustel said that the major part of the proposed tariff was drawn up by D. Dana Bartlett, New York, and himself. After the valuation had been made and the property allocated to the various operating routes, a long study was made of the zone system in an attempt to fit it to the property. This was found impracticable from the physical collection standpoint and from the identification of passenger standpoint, on certain congested territory. The rearrangement of the present system of fare collections was then taken up by sizing up the deficit on the various lines, going over the line carefully and getting information from local superintendents as to the flow of traffic. As far as possible the routes were terminated at neutral points between cities or towns from which traffic flows substantially in both directions. In general, the local rate in cities was set at 6 cents. New zones were fitted into certain lines showing a large deficit and where the total through lengths of ride seemed long for the fares paid.

The witness held that it would be difficult to find a single traffic territory of the system which was paying a 7 per cent return on the present fare basis unless such a territory were narrowed down to an individual city and the 5-cent fare collected in that city, with the existing transfer limit. Lynn, Brockton, Lawrence and Salem might be considered as paying on the above basis, excluding the larger community interests of each outside the cities. Mr. Feustel said that in his opinion a promise to restrict rates in securing a franchise can be shown to be absurd from the standpoint of the people giving it and of those receiving it, and that such promises should have no bearing in an honest attempt to fix fair rates. No attention was paid to the franchise requirements in reaching the rate schedule now before the board for approval. If there was a loss in operating a line the public must pay for it in the end, and whether the public misapprehended the situation for the moment should not enter into the fair fixing of the rate. The witness said that "the method of getting franchises and attempting to fix the fare in the franchise, regardless of knowing what it was going to cost, was one of our unfortunate American methods of having a public utility deal and trade with a public community, and it being as rough a method as it is, it must fall down on both sides in many cases." No moral issue could be seen in such cases in the witness' opinion.

ALBANY FARE ARGUMENTS CONCLUDED

The hearings on the application of the United Traction Company, Albany, N. Y., to the Public Service Commission for the Second District for permission to increase its fare between Albany and Troy from 10 cents to 15 cents were closed on May 17. William E. Woollard, representing the communities affected, declared that the company had failed to show that it must have increased rates on any basis of fair return on the property used in the public service, but had instead submitted a mass of figures showing only that it was not able to meet the fixed charges on its capitalization. H. T. Newcomb, for the company, refused to make an oral argument. He declared his intention of filing a brief later.

Mr. Woollard made his argument on the results of the day's cross-examination of C. F. Hewitt, general manager, and Wilson H. Elder, auditor of the company. During the morning H. C. Hopson, the expert retained by the protesters against the new fares, brought out that the company had never set up any reserve for depreciation as required by the Public Service Commission's uniform system of accounts.

Mr. Hewitt testified on the morning of May 17 that the company had been unable to make new extensions because it was not able to borrow the money necessary on account of its poor credit. The company also submitted an exhibit which purported to show that instead of the Hudson Valley Railway being a drag on the United Traction Company the traction company enjoyed a net return of \$148,000 in 1915 from its interest in the Hudson Valley Railway. The United Traction Company itself in 1915, according to these figures, showed an operating loss of \$219,929.

NEWARK JITNEY SUPPORTERS THREATEN APPEAL

The jitney situation in Newark, N. J., has become involved by the co-enactment of the so-called Kates State law designed to regulate jitneys, which has just become operative, and the regulatory ordinance passed by the local Board of Works of Newark and said to be approved by Mayor Raymond. On one side it is announced that the jitney supporters will seek a writ of certiorari to review the action of the Board of Works in passing the measure. On the other is the statement of Trolley Inspector Crawford that on May 27, with the aid of the police, he intends to proceed under the Kates act by having every jitney owner who has not filed a bond for insurance arrested.

There are at least 400 jitney owners in the city, Mr. Crawford estimates. So far only about fifty of this number have filed bonds with him. His view is that the owners of buses have had ample opportunity to file bonds, as by May 27 practically two weeks will have been given for this purpose. Of the 400 it is expected there are some who will quit business as soon as an attempt is made to enforce the law; in fact, about twelve already have announced such an intention.

DEFENSE OF LOS ANGELES 5-CENT FARE CASES

Inadequate revenue formed the basis of the facts and argument presented by the Pacific Electric Railway in opposition to the contentions of the city of Los Angeles, Cal., for extension of 5-cent fare limits on various lines, described in *ELECTRIC RAILWAY JOURNAL* of May 6, page 862. The company's case was presented on May 16, 17 and 18, at a hearing before the California State Railroad Commission, in Los Angeles, by President Paul Shoup, Traffic Manager D. W. Pontius, Assistant Traffic Manager O. A. Smith, and Chief Counsel Frank Kerr. Voluminous testimony was offered in proof of the company's claims that revenue from the districts to which extensions were demanded would not be sufficient to warrant the extension of the lower fare, and that revenue on the company's lines now existing does not warrant any movement in the direction of reduced rates. Statistics were presented showing the cost of operation on the different lines, and the revenues, also a statement showing that the company as a whole is not at the present time making an adequate return on the investment in its facilities.

A statement of particular interest in connection with the Palms case showed the loss in revenue which would result by breaking down the through fares through the operation of the long and short haul principle if the 5-cent fare were

established to Palms, with through fares based on the sum of the resulting reduced locals.

This was the final hearing in these cases, but the company has until June 10 to put in further statistics of travel requested by the commission, after which briefs will be filed by the city and the company.

CHICAGO ELEVATED BIDS PUBLIC'S CO-OPERATION

Elevated News, published in the interest of the elevated railways of Chicago, took on a new form with the May issue, changing from a four-page folder to an eight-page booklet. In it appeared the announcement that the company hoped to become a medium through which co-operation of the public with the company and its employees may be more fully developed and expressed. An article entitled "Co-operation" reads as follows:

"In the operation of a public utility the co-operation of the public with the company and its employees is essential if the highest degree of efficiency and the best service are to be attained. In the nature of things, it is impossible for the officials entrusted with the management of the elevated railroads to come in personal contact with the hundreds of thousands who daily use the lines. The attitude of the company toward its patrons must in a large degree be reflected through the conduct of the employees and the character of the service given.

"The management of the elevated railroad is frankly desirous of establishing and maintaining the most harmonious relations with its patrons. It realizes that a pleased public is a most valuable asset. It recognizes that there are human limitations beyond which the company cannot go in the matter of service, but it desires to give the best service possible within such limitations. It is constantly trying to improve the service and believes that its patrons appreciate that fact. *Elevated News* is issued to help the company, its employees and patrons to become better acquainted. We are all human and life's little irritations become less annoying when viewed with a little human understanding. Instead of indulging in useless criticism, let us all work together in a spirit of co-operation and in this way make for better service and a greater Chicago in which we are all interested."

HEARING ON ADDITIONAL CARS FOR BROOKLYN

The Public Service Commission for the First District of New York is conducting a hearing into the need for additional surface cars on the Brooklyn Rapid Transit System. The company contends that the opening of the new rapid transit lines will release a sufficient number of cars to permit it to give adequate service on all surface lines without purchasing additional equipment.

William H. Smith, supervisor of inspectors for Brooklyn for the commission, was a witness on May 15, 18 and 22. He testified regarding the number of surface cars operated and kept in reserve by the company. He also testified regarding the number and types of cars operated in the congested sections during the rush hours and the average number of standing passengers carried during the evening rush hours. On May 22 D. L. Turner, engineer in charge of subway construction, testified regarding the dates when the various sections of the dual subway system would be completed and the rapid transit facilities the system would supply to various sections of Brooklyn where there are no such facilities at present. W. G. Gove, superintendent of equipment of the company, testified on the same day regarding the inspection and overhauling system of the company. He also spoke of the present abnormal condition of the steel and copper market and the increased cost of equipment if ordered at this time. He expressed the opinion that it would be impossible to secure new cars of the Brooklyn center-entrance type for at least nine months. On May 24 W. S. Menden, chief engineer of the New York Municipal Railway Corporation, testified regarding the relief which he expected would be afforded the Brooklyn surface lines when the dual system was put in operation. William Siebert, superintendent of surface transportation, testified regarding the number of surface cars which would be released when the new rapid transit lines were opened and also the number of additional cars needed for various extensions. The hearing was then adjourned until June 2.

Chain Tickets Offered in New York.—A soldier of fortune has appeared in New York who is offering subway and elevated tickets to the gullible under the old endless chain scheme. This man is out of the West and made his way to New York via Denver. He operates as the Economic Ticket Company and claims to be new at the business. He stated in an interview, however, that he had neither advertised nor used the mails in furthering his sales.

New York Smoking Rule to Stand.—The Public Service Commission for the First District of New York decided, on May 22, not to abrogate the present regulations as to smoking in cars. This decision was made known in an order denying the application of Charles Dushkind, secretary and counsel of the Tobacco Merchants' Association of the United States, asking that the commission rescind the order of Sept. 16, 1913, which governed the conditions on which smoking is permitted on certain cars of the surface lines. The Tobacco Merchants' Association sought also to have the commission issue an order requiring all railroad companies operating elevated or surface lines in the city to provide smoking cars or cars having smoking compartments. The order of the commission now confines smoking to the four rear seats of open cars and of convertible cars. Similar requests of the advisory board of the cigar makers' organization to the commission were also denied.

Twin City's Broad Publicity Policy Delineated.—An engaging description of the versatility shown by the Twin City Rapid Transit Lines, St. Paul and Minneapolis, Minn., in making its advertising produce results is contained in the May 18 issue of *Printers' Ink* in the form of an article by T. D. MacGregor entitled "Keeping Dividends Up by Putting Advertising on the Payroll." The article maintains that an intelligent and consistent policy of advertising for ten years and the training of employees in courtesy and efficiency have been important factors in the present success of the company and its popularity with the press and public of its territories. The development and influence of the company's publicity department under the experienced hand of A. W. Warnock, its general passenger agent, is outlined in the article. This publicity has assumed definite shape in the publication of booklets, folders and advertisements exploiting the Twin Cities, their attractive surroundings and agreeable method of transportation, and treating such subjects, for example, as hints to employees on how to treat the public. Full page advertisements have been frequently placed from time to time in the newspapers urging the public to co-operate in reducing accidents. An unusual practice described is that of publishing a display advertisement in the newspaper occasionally explaining why cars were delayed beyond a period of ten minutes.

New Bay State Folder Shows Through Routes.—A new folder advertising trolley trips has been issued by the Bay State Street Railway, Boston, Mass., under the direction of Ralph M. Sparks, general passenger agent. The folder contains sixteen pages and includes time-tables, halftones, and descriptive matter relative to points of interest on the company's system and its connections, with maps of the Boston rapid transit lines and special trolley trips along the north and south shores of Massachusetts and via interior routes reached by the company's service. A new and improved feature of the folder is a large map of the Bay State system, on which all through car service is indicated by carrying solid lines of various colors from terminus to terminus. Important terminals or transfer points are shown in circles, and where a through route begins or ends at one of these it is so indicated upon the map, the line being carried through the circle when the service is continued without change to another point. Local lines are shown with points of connection to through routes, and by reference to the map the number of cars required for a journey between any two points on the systems north and south of Boston instantly can be ascertained. Lines of other street railways in the territory are also shown. A new route described in the folder covers the shore trip from Boston to Portland, Me., ten hours and twenty minutes of actual running time being scheduled, with ten changes en route.

Personal Mention

Mr. Fred C. Hornstein has resigned as general superintendent of the Ephrata & Lebanon Traction Company, Lebanon, Pa., to accept a position as superintendent of station erection with the New York Steam Company, New York.

Mr. W. B. Anderson is now assistant treasurer of the Pensacola (Pa.) Electric Company, taking the place of Mr. E. J. Seaborn, who is now with the Tampa Electric Company. Mr. Anderson was formerly in the treasurer's office of the Tampa Electric Company.

Mr. E. Sears has been placed in charge of the maintenance of electric equipment on the Chicago, Milwaukee & St. Paul Railway, with headquarters at Deer Lodge, Mont. Through a typographical error in an item in the *ELECTRIC RAILWAY JOURNAL* for April 29 the name was printed Mr. E. Fears.

Mr. William von Phul, a member of the firm of Ford, Bacon & Davis, residing in New Orleans, has been appointed to succeed Mr. Charles N. Black as vice-president and general manager of the United Railroads, San Francisco, Cal., effective on June 1. Announcement of the appointment was made in San Francisco on May 20.

Mr. Horace Flegg, of the engineering department of the Denver (Col.) Tramway, has been granted leave of absence and has gone to Boston, Mass., where he is temporarily associated with Mr. John A. Beeler, consulting engineer to the Bay State Street Railway, in connection with the fare case now before the Public Service Commission of Massachusetts.

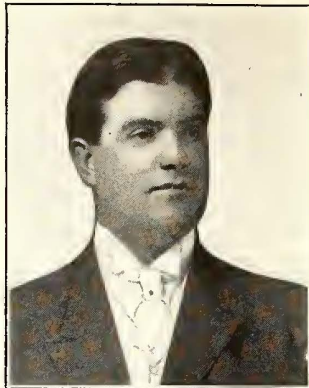
Mr. H. A. Albin, who has had the supervision of the construction and operation of the lighting and power plant of the Lebanon Valley Light & Power Company in Schaeffers-town, Kleinfeltersville, Richland, Milback Springs and Newmantown, Pa., has had added to his jurisdiction the position made vacant by the resignation of Mr. Fred C. Hornstein as general superintendent of the Ephrata & Lebanon Traction Company.

Mr. Philip D. Laird of Montgomery County has been appointed a member of the Public Service Commission of Maryland, succeeding Mr. W. L. Henry, whose term has expired. Mr. Laird was formerly chairman of the commission, but resigned about a year ago because of ill health. He has now recovered. The new commissioner was speaker of the House of Delegates in the last Maryland Legislature. The appointment becomes effective on June 1.

Mr. Hugo Wurdack, St. Louis, president-elect of the Missouri Association of Public Utilities, was born at St. Louis on March 9, 1871, and has resided in that city continuously since that time. During the greater part of his life he has been engaged in the public utility business. For two years he was in the employ of the St. Louis Illuminating Company and later acted as superintendent of the electrical department of the Laclede Gas Light Company. After fourteen years of service in that position he became assistant general manager of the Laclede Power Company. He has been president of the Light & Development Company, St. Louis, since 1907.

Mr. George Quackenbush, formerly traffic manager of the Illinois Traction System, has been appointed assistant general manager of the Rock Island Southern Railway System, Rock Island, Ill., in charge of operation, reporting to Mr. E. C. Walsh, Jr., vice-president. Previous to becoming traffic manager of the Illinois Traction System in March, 1910, Mr. Quackenbush was assistant general freight agent of the Chicago & Alton Railroad, and prior to that held important traffic positions with the Iowa Central Railroad. For a time he retired temporarily from the traffic department of the Chicago & Alton Railroad to accept a position as manager of the Western Union Telegraph Company at Denver, Col. Mr. Quackenbush remained in the service of the Illinois Traction System until October, 1914, when he resigned to take up private business.

Mr. F. R. Slater, who has been elected president of the Southwestern Electrical & Gas Association, is acting general manager of the Texas Power & Light Company, with headquarters at Dallas. Mr. Slater has been connected with the Texas Power & Light Company since 1912 and is well known among electric railway operators, particularly in the East. He was graduated from Cornell University in 1894. After completing his course in electrical and mechanical engineering he was engaged for a short time in the design of the power station of Columbia University, after which he entered the designing department of the Otis Elevator Company. On the outbreak of the war with Spain he decided to engage in military service and served as adjutant in the First United States Volunteer Engineers. After the close of the war he joined the forces of the Manhattan Railway, New York, N. Y., which was then converting its elevated lines from steam to electricity. He remained with that company until he joined the engineering forces in connection with the building of the original New York subway. On the subway work, Mr. Slater was assistant engineer in charge of the construction of the d.c. distribution system and later was principal assistant engineer. He and Mr. H. N. Latey subsequently formed a partnership under the firm name of Latey & Slater for the general practice of engineering with offices in New York, but he withdrew from the firm in 1912 to go to Dallas. At the time of the St. Louis Exposition in 1904, Mr. Slater served as a member of the advisory council of the Electric Railway Test Commission.



F. R. SLATER

Mr. E. C. Allen, the newly elected president of the Iowa Electric Railway Association, is general manager of the Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa. He was born in Ypsilanti, Mich., in 1875, was graduated from Michigan College in 1895, and completed a special course in law at the University of Michigan in 1897. In July, 1897, Mr. Allen took charge of the material and time keeping during the construction of the interurban railway between Ann Arbor and Detroit, Mich. Upon the completion of this construction he was made traveling auditor and later general freight agent. In this latter position he was a pioneer in the development of interurban freight traffic. In 1902 the road between Ann Arbor and Detroit was extended to Jackson, Mich. In 1903 it was taken over by the Detroit United Railway and Mr. Allen was made superintendent. In 1913 he resigned from the Detroit United Railway to become general manager of the Cedar Rapids & Marion City Railway. The company owns 27.5 miles of line and operates fifty-two motor cars and seven other cars. It is controlled by the United Light & Railways Company.

Mr. T. C. Cherry has been made second vice-president and general manager of the Auburn & Syracuse Electric Railroad, Syracuse, N. Y., under the financial readjustment outlined in the *ELECTRIC RAILWAY JOURNAL* of May 13, page 925. Mr. Cherry was born and educated in Syracuse and in 1894 entered Syracuse University, where he took an engineering course and a two-year course in law. He entered the employ of the Syracuse Rapid Transit Railway, working on construction and track work but later was made superintendent of track. In 1900 he went to Lorain, Ohio, as superintendent of construction of line and track under Mr. C. Loomis Allen, who was then general manager of the Lorain Street Railway. Mr. Cherry served as dispatcher and was later made general manager of the company. Since that time he has been connected with electric railway, light and gas companies in New York, Michigan, Ohio and Pennsylvania. For the last four years Mr. Cherry has been vice-president and general manager of the Maryland Electric Railways, Annapolis, Md. He is a director in the firm of Allen & Peck, Inc.

Mr. E. W. Holst, who was appointed mechanical engineer of the Bay State Street Railway, Boston, Mass., on May 4, was the subject of a brief biographical sketch, with a portrait, in the *ELECTRIC RAILWAY JOURNAL* of March 18, 1916, page 584. His service with the Bay State Street Railway and its predecessors dates from 1904, when he joined the staff as superintendent of car repairs. In 1907 he was appointed superintendent of equipment of the entire system, which includes nearly 1000 miles of track in three States. Two principal types of passenger cars have been designed by Mr. Holst. In 1909 he brought out the reduced weight semi-convertible car well known to readers of this paper, in which a saving of 6600 lb. was obtained without sacrifice of strength and efficiency as a transportation unit, and in 1915 a convertible car of reduced weight and embodying many novel features was designed by him. This was described in the *ELECTRIC RAILWAY JOURNAL* of Oct. 23, 1915, page 854. Mr. Holst also designed a reduced weight truck for his company, and has done similar work in the field of express car design. He always has been very active in the American Electric Railway Engineering Association, is a prominent member of the New England Street Railway Club, and is now president of the New England Railroad Club. In his new work he will have charge of all construction and reconstruction in the mechanical field of the company's operations.

Mr. Howard W. Irwin, whose appointment as superintendent of car repairs of the Bay State Street Railway, Boston, Mass., was noted in the *ELECTRIC RAILWAY JOURNAL*



H. W. IRWIN

of May 13, is a native of Brattleboro, Vt., and has had varied experience in both central station and railway fields. He was educated at Amherst College and at Purdue University, receiving the degree of B. S. of M. E. from the latter institution in 1903. Mr. Irwin was first employed by the General Electric Company, and was assigned to the steam turbine test at the Schenectady, N. Y., works, later being placed in charge of this testing service. In 1905 he was appointed assistant superintendent of power, in immediate charge of the electric motor drives in the entire plant. He left Schenectady in 1906 to become manager of the public utility properties of the Northern Electric Company, with headquarters at Fargo, N. D. In 1910 Mr. Irwin joined the staff of the Bay State company as superintendent of instruction. In this connection he was responsible for many novel features of the instruction car described in the *ELECTRIC RAILWAY JOURNAL* of Aug. 13, 1910, page 252. Mr. Irwin subsequently became assistant superintendent of equipment, and then investigating engineer of the department of motive power and machinery. He is a member of the New England Street Railway Club, Engineers Club of Boston, and an associate member of the American Institute of Electrical Engineers. In his new work he will have general charge of rolling stock maintenance and shop administration over the entire system.

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OBITUARY

Walter P. Ellingwood, connected with the Puget Sound Electric Railway at Puyallup, Wash., died recently from injuries sustained in an automobile accident. Mr. Ellingwood had been in the company's service fifteen years.

Marion H. Keyes, formerly superintendent of the Pennsylvania Avenue division of the Capital Traction Company, Washington, D. C., is dead. Mr. Keyes was born in Prince William County, Virginia, in 1853 and went to Washington in early manhood. He was first employed in the surveying department of the district government, and in 1875 entered the service of the Capital Traction Company. He retired from the company in 1909.

Construction News

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

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

RECENT INCORPORATIONS

***Chester & Eddystone Street Railway, Harrisburg, Pa.**—Chartered in Pennsylvania to operate a 2 1/3-mile electric railway in Delaware County, Pa. Capital stock, \$15,000. Van Horn Ely, president of the National Properties Company Philadelphia, Pa., president. Directors: Henry P. Carr and Harold B. Anderson, Philadelphia; John J. Henderson, Melrose Park, Pa., and T. W. Wilson, Wilmington, Del. [April 15, '16.]

FRANCHISES

Martinez, Cal.—The Martinez & Concord Interurban Railway has asked the Council for a franchise to construct a line on Escobar Street eastward from Pine Street. The project for building the line along Main Street has been abandoned. [April 29, '16.]

Lakeland, Fla.—The Tampa & Eastern Traction Company has received a thirty-year franchise from the City Commissioners to construct a line in Lakeland. Frank L. Cooper, secretary. [May 6, '16.]

Tampa, Fla.—The Export Phosphate Railway & Terminal Company has received a franchise from the City Council to construct a line in Tampa. A provision in the franchise provides for the electrical operation of the line not later than two years from the date of starting operations. The American Agricultural Chemical Company, New York, is financing the line. H. L. Pierce is interested. [July 25, '14.]

Springfield, Mass.—The Springfield Street Railway has asked the Council for a franchise to double track its line through Park, River and Bridge Streets, West Springfield.

Brooklyn, N. Y.—Three applications made by companies in the Brooklyn Rapid Transit system for extensions of surface car lines in Brooklyn and Queens have been granted by the Public Service Commission for the First District of New York during the week as follows: Brooklyn Heights Railroad Company, extension from Fresh Pond Road at intersection of present tracks with tracks of the Lutheran Cemetery line, thence along Fresh Pond Road to form a connection with the existing tracks of the company in Myrtle Avenue; Brooklyn, Queens County & Suburban Railroad Company, extension on Metropolitan Avenue from Dry Harbor Road to Jamaica Plank Road; Nassau Electric Railroad, extension on Eighth Avenue, from Thirty-ninth Street to Bay Ridge Avenue. All three extensions are to be two-track surface lines.

Buffalo, N. Y.—Application will soon be made to the City Council by the International Railway Company for a franchise to lay double tracks and operate cars through Franklin Street from Chippewa Street to Allen Street, 1/2-mile.

Jackson, Tenn.—The Jackson Railway & Light Company has received permission from the City Commission to construct a double track on Main Street from Market to Royal Street.

Tacoma, Wash.—The County Commissioners have approved the transfer of the franchise held by the Tacoma Railway & Power Company to the Pacific Traction Company. The latter company will extend its line from the State Hospital for the Insane to Steilacoon.

TRACK AND ROADWAY

***Edmonton, Alta.**—Plans are being prepared by E. W. Bowness of the Edmonton Power Company for the development of a municipal power system, including railway, to cost about \$500,000.

***Flagstaff, Ariz.**—It is reported that Gen. M. H. Sherman, Los Angeles, contemplates the construction of an electric railway from Flagstaff to Grand Canyon, 70 miles.

Fresno (Cal.) Interurban Railway.—Work has been begun by this company on the construction of its 11-mile extension from Barton Vineyard to Centerville. It is expected that the line will be completed and in operation about June 15.

Martinez & Concord Interurban Railway, Martinez, Cal.—This company was authorized on May 15 by the Railroad Commission of California to issue securities preliminary to constructing a line from Martinez to Concord. The first unit of the line will extend from Martinez to Government Ranch, 6 1/2 miles. The Commission's order is made contingent upon the company's obtaining the necessary franchises. The securities authorized are 600 shares of stock to be sold at \$80; \$125,000 of first mortgage bonds to be sold at \$90, and \$125,000 cumulative participating bonds to be sold at par and the proceeds to be used in retiring the first mortgage bonds. [April 29, '16.]

Washington & Old Dominion Railway, Washington, D. C.—It is reported that this company is considering the construction of an extension in Virginia.

Miami (Fla.) Traction Company.—A report from this company states that it has placed an order for steel rails for a 1-mile extension.

Tampa & Eastern Traction Company, Tampa, Fla.—Preliminary surveys are under way for this company's proposed line from Tampa to Lakeland, 33 miles. It is reported that the contract for the construction of the line has been conditionally awarded to the Utilities Construction Company, Norristown, Pa. F. L. Cooper, Tampa, Secretary. [May 6, '16.]

Chicago Heights (Ill.) Street Railway.—A contract has been let by this company for the construction of a line on Fourteenth Street from Wentworth Avenue to East End Avenue.

Decatur Railway & Light Company, Decatur, Ill.—This company, a subsidiary of the Illinois Traction System, Peoria, Ill., will extend its Eldorado Street line from William and Seventh Streets north to the tracks of the Wabash Railway Company.

Southern Traction Company, Bowling Green, Ky.—This company reports that it has purchased material for the construction of about a half mile of track.

Louisville (Ky.) Railway.—Announcement is made by T. J. Minary, president of the Louisville Railway, that the Madison Street extension, connecting with the Chestnut Street line, will be placed in operation on June 1.

Paducah (Ky.) Traction Company.—A report from this company states that it has placed contracts for the construction of double track on Broadway between Eleventh and Seventeenth Streets, in place of the present single track. The company will use 80-lb. 7-in. rail in place of the present 60-lb. rail.

Winnipeg (Man.) Electric Railway.—It is reported that if the city withdraws its demand for the construction of a line on Talbot Avenue, the Winnipeg Electric Railway will double track its line on Main Street from the north end limits to a point beyond Kildonan Park.

United Railways & Electric Company, Baltimore, Md.—It is reported that this company will construct a 1-mile extension on Liberty Heights Avenue.

Mankato (Minn.) Electric Traction Company.—A report from this company states that it will probably construct an extension into North Mankato this fall.

Kansas City (Mo.) Railways.—Work has been begun by this company on the reconstruction of its Summit Street line from Thirty-third to Thirty-eighth Street.

Interborough Rapid Transit Company, New York, N. Y.—Bids were opened by the Public Service Commission for the First District of New York for the construction of Route 31, a part of the Eastern Parkway line. The lowest bid was submitted by Dennis E. Conners, New York, at \$1,356,000.

New York Connecting Railroad, New York, N. Y.—The Public Service Commission of the First District of New York has authorized the issue of \$8,000,000 in bonds by the New York Connecting Railroad to be used for general construction purposes. The bonds are to be issued to yield 4.5 per cent and will mature in 1953.

New York (N. Y.) Municipal Railway.—During the week the Public Service Commission for the First District of New York opened bids for the construction of Sections Nos. 1 and 4 of Route No. 8, the Fourteenth Street-Eastern subway. The lowest bidders were respectively Booth & Flinn, Ltd., at \$2,527,295, and Mason & Hanger Company, Inc., at \$1,847,174. Section No. 1 extends under Fourteenth Street, Manhattan, from Sixth Avenue to about Irving Place; and Section No. 4 is in Brooklyn, and extends under North Seventh Street and Metropolitan Avenue from Bedford Avenue to Manhattan Avenue. This line is for operation under the dual system contracts by the New York Municipal Railway Corporation. The river tunnel, Section No. 3, is already under contract and work is progressing. On June 5 the Public Service Commission will receive bids for the supply of about 90,000 tons of structural steel for use in the construction of several portions of the dual system rapid transit lines. The commission will go into the open market for this steel, and the construction contractors will merely put in bids for erection, the city furnishing the steel.

Goldsboro Electric Railway Company, Goldsboro, N. C.—This company states that it is in the market for material for the construction of a 2-mile extension, including three railroad crossings and one complete Y.

Northern Ohio Traction & Light Company, Akron, Ohio.—Work will be begun at once by this company on the Winfield Way extension in Canton, and it is expected that the line will be in operation by July. The company is renewing its tracks on Bowery Street from Thornton Street south, and on Bowery Street between Exchange and Wooster Avenue.

Toronto (Ont.) Civic Railway.—This company has awarded a contract to the United States Steel Products Company at \$2,120 for the supply of a special trackwork layout for its St. Clair Avenue carhouse extension.

Trenton, Bristol & Philadelphia Street Railway, Philadelphia, Pa.—Work on the improvement of this company's lines has been begun. The tracks are being overhauled and new ballast distributed. It is estimated that the improvements will involve an expenditure of \$40,000.

Pottstown & Phoenixville Railway, Pottstown, Pa.—In addition to improvements to its rolling stock, this company plans other improvements to its property within the next few months which will aggregate the expenditure of about \$50,000. New 86-lb. rails will be laid west of Manatwary Street and east of Montgomery Street. The construction of an annex to the big auditorium at Sanatoga Park is well under way, and it is expected that the structure will be completed the latter part of this month.

Reading (Pa.) Transit Company.—It is reported that this company will lay 600 tons of new rails in Reading and West Reading this year.

Dallas (Tex.) Standard Traction Company.—This company will construct about a half mile of track in Mount Auburn addition.

Houston (Tex.) Electric Company.—This company will move its tracks on the Fannin Street Extension line for a distance of about 300 ft., to relieve obstruction to the entrance of Hermann Park. The change will cost the company approximately \$3,000.

Princeton (W. Va.) Power Company.—This company reports that its extension to Bluefield will be placed in operation about July 1. The line will have connection with the Appalachian Power Company for entrance to Bluefield.

Wisconsin Interurban System, Madison, Wis.—A report from this company states that it will soon begin construction on 110 miles of its proposed system. Contracts totaling about \$600,000 have recently been let to Maney Brothers & Company of Oklahoma City for the first 12 miles of line extending on Washington Street, Madison, to Middleton. The franchise calls for the completion of this section by Dec. 31, 1916. The company plans to have the line completed from Madison to Janesville, 38 miles, by Dec. 31, 1917; from Madison to Portage, 37½ miles, by Dec. 31, 1918, and from Madison to Prairie du Sac, 23 miles, by Dec. 31, 1918. Further extensions are contemplated to connect Prairie du Sac, Richland Center and Viroqua, 74 miles;

Madison, Sun Prairie and Fond du Lac, 75 miles, and Sun Prairie and Watertown, 25 miles. It is expected ultimately to reach Merrill, Wis. J. E. Jones, Washington Building, Madison, president and general manager. [March 11, '16.]

SHOPS AND BUILDINGS

Kewanee & Eastern Electric Railway, Kewanee, Ill.—It is reported that this company has purchased a site on School and North Streets, Henry, between Third Street and the river, for the construction of a new station.

Springfield (Mass.) Street Railway.—Work will be begun at once by this company on its new Hooker Street carhouse. The building will be 205 ft. x 190 ft., one story high, and will be of brick and concrete construction. The carhouse will include repair shops, storerooms, an assembly hall, locker room, barber shop and restaurant. The cost is estimated at about \$250,000. It is also expected within this estimate to remodel the present carhouse at Carew Street to a considerable extent.

Cincinnati, Lawrenceburg & Aurora Electric Street Railroad, Cincinnati, Ohio.—This company's carhouse at North Bend, containing five cars, was destroyed by fire on May 16. The loss is estimated at about \$20,000.

Lake Erie & Northern Railway, Brantford, Ont.—Plans are being made by this company to construct a station at Brantford. The structure will be one story high and will be located over the tracks at the southwest corner of Colburn and Water Streets, with a 38-ft. frontage on Colburn Street and 76 ft. on Water Street. New England, Colonial style, red brick and limestone trimmings are to be used for the exterior, the roof being of green slate. The interior of the building will be finished in Canadian ash, while the walls and ceilings of the main waiting room are to be plastered and finished with plastered cornices. The floors are of concrete. The tracks will pass beneath the main floor of the building, with platforms, express and baggage accommodation at the lower level. The main floor will contain a waiting room, a women's retiring room and lavatory, men's lavatory and ticket and telegraph offices. The cost is estimated at \$25,000.

POWER HOUSES AND SUBSTATIONS

Connecticut Company, New Haven, Conn.—The J. G. White Engineering Company has received a contract from the Connecticut Company for the construction of a new \$100,000 power house in New Haven, referred to on page 1013 of this issue.

Fort Wayne & Decatur Traction Company, Decatur, Ind.—This company will close its power house and carhouse at Decatur and will be furnished power at Fort Wayne, where all repairs will henceforth be made.

Commonwealth Power, Railway & Light Company, Grand Rapids, Mich.—It is reported that this company contemplates the construction of a hydroelectric plant at the junction of the Pine and Manistee Rivers, near Wexford.

United Railways, St. Louis, Mo.—The Kirkwood Board of Aldermen has granted a permit to the United Railways to construct a substation at Washington and Fillmore Avenues, Kirkwood.

Interborough Rapid Transit Company, New York, N. Y.—This company has placed an order with the General Electric Company for nine 4000-kw. rotary converters and nine 4200-kva. transformers.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—The new 20,000-hp. addition to the Lowellville power house of the Mahoning & Shenango Railway & Light Company, construction of which was begun last October, has been placed in operation. The plant now has a capacity of 40,000 hp.

Rutland Railway, Light & Power Company, Rutland, Vt.—This company is installing a frequency changer in its Cleveland Avenue substation to convert the 25-cycle electric power generated at the Mendon and Carvers Falls station into 60 cycles.

Wisconsin Valley Electric Company, Wausau, Wis.—This company reports that it has a new power house and generating station under construction.

Manufactures and Supplies

BRAND TO MARK TIMBER QUALITY

Branding of timber has been specified through a cooperative arrangement on lumber specifications by the Illinois Society of Architects and the manufacturers of Southern pine lumber. The adoption of these specifications for lumber to be used in buildings in Illinois will give the owners an assurance that structures in which branded timber is used will be adequate to meet estimated load requirements. The brand will also be a mark and a guarantee that the timber is of a certain quality. The action of the Illinois Society of Architects met with such immediate approval that it is quite possible that a national standard specification of this kind will be adopted.

It is also of interest to note that in connection with these specifications the Illinois Society of Architects has recognized the results of the work recently done by the Forest Products Laboratory of the United States Department of Agriculture, namely, that it is possible to distinguish long-leaf pine from shortleaf pine by certain visible characteristics. The results of this investigation were only made known in December, 1915, consequently they were not taken into account by the new specifications for dense Southern yellow pine recently adopted by the American Society for Testing Materials and the American Railway Engineering Association. The specifications of these two societies, however, have been accepted by the Illinois Architects Society as the correct measure for the structural qualities of timber. The architects' specifications also differentiate between timber requiring strength and durability and that requiring strength without reference to durability. These characteristics are provided for through a minimum heart requirement where durability is essential and an optional heart requirement where durability is not so necessary.

ROLLING STOCK

Louisville (Ky.) Railway is reported to be in the market for additional cars.

Kansas City (Mo.) Railways are remodeling several cars in their shops.

Illinois Traction System, Peoria, Ill., is in the market for 100 box cars, sixty hopper-bottom coal cars and forty flat-bottom gondola cars.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., is buying three all-steel interurban passenger cars and one steel underframe express car.

Cincinnati, Lawrenceburg & Aurora Electric Street Railway, Cincinnati, Ohio, lost five large cars in a fire on May 16 which destroyed the carhouse at North Bend.

Des Moines (Iowa) City Railway is remodeling forty old city cars at its own repair shops. This company is also overhauling six coal cars which will be made into side-dump cars for interurban roadway service.

Valley Railways, Lemoyne, Pa., are in the market for four 40-ft. semi-steel trolley cars with plain arch roofs and a seating capacity of forty-four, equipped with trucks, motors and air brakes.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of October 23, 1915, as having ordered ten car bodies from the Southern Car Company, has recently ordered fifteen additional car bodies from the same company.

Northern Ohio Traction & Light Company, Akron, Ohio, has placed in operation in Canton five of the new steel pay-as-you-enter type cars. The work of rebuilding the large cars now in use in Canton to pay-as-you-enter type has been started, five of the cars being sent to the G. C. Kuhlman Car Company's shops to be remodeled.

Pottstown and Phoenixville Railway, Pottstown, Pa., is reported to have ordered from The J. G. Brill Company, for service in Pottstown, six double-truck, all-steel, convertible, pay-within cars, to be equipped with Westinghouse

HL control and 632-B motors. The cars will be similar to those now operated by the Third Avenue Railway, New York, N. Y., and are to be delivered about August 1. Two cars of the same type have been ordered for the Phoenixville division. The company plans to withdraw the small single-truck cars upon delivery of the new cars. Ten complete National air equipments have been ordered for these cars and others now in service in Pottstown. Two 39-E trucks have also been ordered from The J. G. Brill Company for delivery by July 1.

Detroit (Mich.) United Railway, noted in the ELECTRIC RAILWAY JOURNAL of April 22 as having ordered eight 53-ft. 11-in. motor cars and eight trailers of the same length from the G. C. Kuhlman Car Company, has specified the following details for this equipment:

Seating capacity	Motor Cars	Trailers
Weight of car body	54	60
Bolster centers, length	32,000 lb.	32,000 lb.
Length of body	29 ft. 9 in.	29 ft. 9 in.
Length over vestibule	42 ft. 9 in.	42 ft. 9 in.
Width over sills	53 ft. 11 in.	53 ft. 11 in.
Height, rail to sills	8 ft. 3 3/4 in.	8 ft. 3 3/4 in.
Body	38 1/2 in.	38 1/2 in.
	Wood	Wood
Interior trim	Quarter-sawed oak	Quarter-sawed oak
Headlining	Agasote	Agasote
Roof	Monitor removable hoods	Monitor removable hoods
Underframe	Steel	Steel
Air brakes	West. A.M.M.	West.
Cables	West.	
Conduits and junction boxes	West	
Control	West. H.P.L.	
Couplers	Tomlinson radial, spear head type	Tomlinson radial, spear head type
Curtain fixtures	Forsyth No. 88 ring fixtures	Forsyth No. 88 ring fixtures
	Rex All-metal rollers	Rex All-metal rollers
Curtain material	Pantasote	Pantasote
Destination signs	Hunter illuminated vestibule	
Door engines	Nat'l Pneumatic for rear entrance and exit doors only	Nat'l Pneumatic for front entrance and exit doors only
Fenders	Ry. Standard	Ry. Standard
Gears and pinions	West.	
Gongs	Ry. Standard	
Hand brakes	Peacock	Peacock
Heaters	Peter Smith hot water No. 1C	Peter Smith hot water No. 1C
Headlights	G. E. D-16-Y	
Journal boxes	Standard C-60	Standard C-60
Motors	4 West. 557 A, inside hung	
Registers	Ohmer	Ohmer
Sanders	Ry. Standard with O-B Sander valves	
Sash fixtures	Nat'l L. W. sash locks	Nat'l L. W. sash locks
Seats	Hale & Kilburn No. 11A	Hale & Kilburn No. 11A
Seating material	Main compartment dark green frieze plush; smoker, dark green leather	Dark green frieze plush
Step treads	Am. Mason Safety-Steel & Carborundum	Am. Mason Safety
Train signal	Consol.	Consol.
Trolley retrievers	Knutson No. 2	
Trolley base	U. S. No. 14	
Trucks	Standard C-60	Standard C-60

TRADE NOTES

McGuire-Cummings Manufacturing Company, Chicago, Ill., built the Des Moines (Iowa) City Railway cars described in the ELECTRIC RAILWAY JOURNAL of May 20.

Acme Supply Company, Chicago, Ill., has removed its general sales office to larger quarters located at Suite 1110-1113 Steger Building, 28 East Jackson Boulevard, Chicago.

E. N. Lake, Chicago, Ill., consulting engineer, has been retained by the Kansas City (Mo.) Railways to investigate its power requirements and prepare plans for future line and substation extensions.

The J. G. Brill Company, Philadelphia, Pa., has received a contract for nine sets of trucks (eighteen) for use on the new express cars of the Bay State Street Railway. The trucks are designed for 35,000-lb., king-pin load.

Holden & White, Chicago, Ill., general sales agents for the Garland ventilator, have just received, through their Eastern representative, the U. S. Metal & Manufacturing Company, an order for 400 Garland ventilators from the Public Service Railway, Newark, N. J.

Curtain Supply Company, Chicago, Ill., writes that it has the order for the curtain fixtures to be supplied to the new Des Moines front and center entrance cars, described in the issue of this paper for last week. These cars will also be supplied with "Rex All-Metal" rollers.

Henry M. Cleaver, for some years advertising manager of the Niles-Bement-Pond Company, New York, is now located at the Pond works of the company, Plainfield, N. J., to the affairs of which he will devote himself exclusively in the future. The advertising department is in charge of D. M. Crossman, heretofore assistant advertising manager.

American Brake Shoe & Foundry Company, Mahwah, N. J., at a meeting of its board of directors, elected Otis H. Cutler, chairman of the board of directors and William G. Pearce, president of the company to succeed Mr. Cutler, who retired from the presidency. James S. Thompson, William S. McGowan and Clifton D. Pettis were elected additional vice-presidents.

Gary Tube Company has been incorporated with a capital stock of \$100,000 for the purpose of constructing the National Tube Company's \$25,000,000 steel plant at Gary, Ind. Robert W. Campbell of Chicago heads the list of incorporators. The Gary Tube Company will be part of the National Tube Company, a subsidiary of the United States Steel Corporation.

Unit Railway Car Company, Newton, Mass., is having a new type of self-propelled car built by the Laconia Car Company. This car is steam-driven, with an engine and boiler similar in construction to those used in the Stanley automobile, although, of course, of greater capacity. The directors of this company are as follows: Freelan O. Stanley, Francis E. Stanley, P. H. Gentzel, Carlton S. Stanley, Prescott Warren and Edward M. Hallett.

Dexter Metal Manufacturing Company, Camden, N. J., has taken over the interests, plant and good will of Merritt & Company, together with all their modern facilities for the manufacture of steel lockers, shelving, etc., and have installed a new department for the manufacture of wire guards of all descriptions and ornamental brass and iron work. William A. Parent, formerly general manager of Edward Darby & Sons, has resigned to become general manager of the Dexter Metal Manufacturing Company.

Smith-Ward Brake Company, New York, N. Y., has received orders to equip with brake adjusters the following cars: Springfield (Mass.) Street Railway, ten cars; Reading Transit & Light Company, Reading, Pa., fifteen cars; Holyoke (Mass.) Street Railway, ten cars; Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, ten cars; Rhode Island Company, Providence, R. I., fifty cars; Scranton (Pa.) Railway, ten cars; Schenectady (N. Y.) Railway, sixteen cars; Binghamton (N. Y.) Railway, sixteen cars, and Chicago & Milwaukee Electric Railroad, Highland, Ill., fifteen cars.

Frankel Connector Company, Inc., New York, N. Y., announces that the electrical department of the Frankel Display Fixture Company has recently been incorporated under the first-mentioned title to carry on the manufacture of Frankel solderless connectors, testing clips and other electrical specialties. The connectors are described in the "Equipment and Maintenance" department of this issue. The company is also manufacturing a line of connectors for panel boards to replace soldered terminal lugs for front and back connections. The office and factory of the Frankel Connector Company, Inc., are located at 177-179 Hudson Street, New York City.

J. M. Fitzgerald has resigned as manager of the signal department of The Railroad Supply Company, Chicago, and has associated himself with O. S. Flath, forming the Alger Supply Company, 550 Peoples Gas Building, Chicago. The latter company will handle railway and electrical supplies. It now represents the Electrical Sales Company, sole distributors of the Schwarze bells and other products, Signal Accessories Company, sales agents of various signal materials and supplies, C. H. Whall, fiber, and the Chausse Manufacturing Company, manufacturers of kerosene vapor torches. This latter product is particularly adapted for preheating welding work.

E. T. Sawyer, who has been associated with the Commercial Acetylene Railway Light & Signal Company for over eight years, has resigned to accept a position as sales engineer with the Edison Storage Battery Company. Mr. Sawyer, from about 1901 to 1904, was with the Western office of the Dressel Railway Lamp Works of New York and the Star Brass Manufacturing Company of Boston. He later spent four years in the employ of the Acme Ball Bearing Company as manager of the railway department. His first three years in the employ of the Commercial Acetylene Railway Light & Signal Company were spent as Southern manager. For the last five years he has been connected with the main office at New York.

The **Barrett Company, New York, N. Y.**, having been convinced that with the workmanship properly safeguarded a Barrett specification roof will last for a minimum period of twenty years without repairs, will henceforth give a twenty-year surety bond guaranty without charge on all Barrett specification roofs of fifty squares or more in the United States and Canada, in towns of 25,000 and over, and in smaller centers where its inspection service is available provided the roof is laid by a roofing contractor satisfactory to the company and in strict accordance with the Barrett specifications dated May 1, 1916, and subject to the inspection and approval of the Barrett Company. This surety bond will be issued by the U. S. Fidelity & Guaranty Company of Baltimore.

Sherwin-Williams Company, Cleveland, Ohio, foreseeing the difficulties of importing dyes from abroad, has developed extensive facilities for manufacturing dyestuffs at its dry color works at Chicago. It had previously erected a tar distillation plant which produced some of the important basic materials used in the manufacture of dyes. This plant was quickly enlarged and expert chemists were engaged to install and operate complete and efficient works for the production of finished dyes. These works are now in operation and are producing daily an output of paranitraniline and betanaphthol of quality equal to the best that has been imported. Additional equipment will shortly be installed which will double the output, and orders are now being accepted for the surplus not required in the company's own color works. The company is also booking orders for para reds and is also actively engaged with plans for the production of many other important dyes.

ADVERTISING LITERATURE

A. & F. Brown Company, Elizabethport, N. J., has issued its 1916 catalog on "Transmission Machinery" which fully describes its castings, pulleys, hangers, etc.

Bessemer Limestone Company, Youngstown, Ohio, has issued an illustrated booklet on "Bessemer Block" which describes its plants, methods of manufacture and the progress of Bessemer block in the paving brick industry. The illustrations show a number of installations, among which are several railway scenes. "Bessemer Wire-Cut-Lug Paving Brick" is the title of another booklet recently issued by this company, describing the advantages of wire-cut-lug brick over repressed brick.

National Pneumatic Company, New York and Chicago, has just brought out a 200-page cloth-bound book entitled "Door and Step Control," both manual and pneumatic systems. The large number of installations shown, the great variety of operating conditions to which this company's control has been adapted and the auxiliary devices used in connection therewith, such as interlocking safety door control, make clear what remarkable strides have been made in getting the all-inclosed car over the line quickly and safely. The description of the manufacturing methods makes it plain that modern door and step control demands highly specialized machinery and engineering ability. Among many other features of this publication is a series of diagrams showing the layout of door and step control for a great variety of cars to aid the user in the selection for a given car design. The book also describes briefly National pneumatic control for ventilator sashes, garage doors and other miscellaneous purposes. Electric railway men who have not received a copy of this book are urged to write for it to the National Pneumatic Company.

NEW PUBLICATION

Official Proceedings of Third National Foreign Trade Convention. Secretary, National Foreign Trade Council, India House, Hanover Square, New York, N. Y. 500 pages. Buckram, \$1.50, postpaid.

This compendium of information on foreign trade subjects is supplied without charge to all delegates, but a limited edition is also placed on public sale. The book is a verbatim report of the addresses by leaders of American industry and the practical and constructive discussion of the most important phases of foreign trade by the 500 prominent business men who attended the convention in New Orleans on Jan. 27-29, 1916.