

Electric Railway Journal

A CONSOLIDATION OF
Street Railway Journal and Electric Railway Review

VOL. XXXIV.

NEW YORK, SATURDAY, JULY 31, 1909

No. 5

PUBLISHED EVERY SATURDAY BY THE

McGraw Publishing Company

James H. McGraw, President. J. M. Wakeman, 1st Vice-president.
A. E. Clifford, 2d Vice-president. C. E. Whittlesey, Sec. and Treas.

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NEW YORK, 239 WEST THIRTY-NINTH STREET.

CHICAGO: Old Colony Building.
PHILADELPHIA: Real Estate Trust Building.
CLEVELAND: Schofield Building.
LONDON: Hastings House, Norfolk St., Strand.

Cable Address, Stryjourn, New York; Stryjourn, London—Lieber's Code.
Entered at the New York Post Office as Second Class Mail Matter.
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TERMS OF SUBSCRIPTION

United States, Hawaii, Puerto Rico, Philippines, Cuba, Mexico and Canal Zone.

ELECTRIC RAILWAY JOURNAL (52 weekly issues and also special daily convention issues published from time to time in New York City or elsewhere), postage prepaid..\$3.00 per annum

Single copies.....10 cents

Combination Rate, in connection with American Street Railway Investments (The "Red Book"—Published annually in May; regular price, \$5.00 per copy).....\$6.50 per annum

CANADA: extra postage.....\$1.50 per annum

To All Countries Other Than Those Mentioned Above.

ELECTRIC RAILWAY JOURNAL (52 weekly issues and also daily editions as above), postage prepaid.....\$6.00 per annum
25 shillings. 25 marks. 31 francs.

Single copies.....20 cents

Foreign subscribers may remit through our London office.

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Of this issue of the ELECTRIC RAILWAY JOURNAL 9000 copies are printed.

Securities for Working Capital in Massachusetts

An act has been passed by the Legislature of Massachusetts and approved by the Governor, which is designed to enable street railway companies of that State to issue securities to provide funds for working capital. It is provided in the act that a street railway company may increase its capital stock for this purpose to an amount not exceeding 5 per cent of the par value of its capital stock then outstanding, "or may issue bonds, secured by mortgage or otherwise, to an amount beyond the amounts fixed and limited

by its agreement of association or by the provisions of any general or special law, and not more than the Board of Railroad Commissioners shall determine will be properly required for such purpose and as said board shall approve as being consistent with the interest of the public and of the stockholders of such company and as not unreasonably reducing the security of any bond previously issued." Heretofore, the street railways of the State have not been able, in the absence of an explicit provision in the law, to issue securities for this purpose. As the margin of profit in the business does not provide sufficient revenue to meet the needs for working capital, companies have been compelled to borrow money. This floating debt, added to other liabilities of the properties, has constituted a serious menace in times of financial distress. The largest companies in Massachusetts have in working capital amounts varying from 5 to 10 per cent of their capital stock. The current liabilities of the street railway companies of the State for the last fiscal year reached a total of \$16,810,000. It is evident from the necessities which led to the authorization of issue of securities for this purpose that some of the companies will petition the board under the act at an early date.

Cash Tickets and Traffic Stimulation

Recent observation of the traffic conditions on a large system where cash tickets are used in connection with pay-as-you-enter cars indicates that such tickets have a much greater value in the stimulation of riding than is generally realized. Operating men appreciate that anything which makes travel more convenient to the public tends to produce growth of business, but often think that the selling of tickets at a flat rate of 5 cents each is a needless complication, since the public pays the same either in cash or paste-board for a given ride. In the case in mind the use of the tickets is undoubtedly greatly increased by the fact that a slight reduction in fare is obtained by purchasing a strip of them, but it is also plain that the convenience of the ticket itself, combined with the fact that it has been paid for by the patron in advance, tends to encourage riding, and particularly short-haul travel. It is a singular characteristic of human nature to regard a strip of purchased tickets much more prodigally than the same value in coin, even where no reduction is made in the price per ride. This characteristic may be based upon the convenience which the ticket affords for paying fare, but is none the less real.

Aside from the encouragement to ride which a strip of unused tickets offers in the pocket of the prospective patron, the arrangement saves the company time in all types of cars, since it eliminates the problem of making change, so far as the tickets are used, and thus releases a certain portion of the conductor's time for other duties, such as watching the entrance and exit of passengers, collection of cash

fares and accurate handling of transfers. With proper precautions there is little to fear from ticket counterfeiters, and the reduction of delays where passengers pay at the vestibule is not to be overlooked. The main point, however, is the incentive to ride which the ticket book provides. Where 6 or 7-cent fares prevail, the ticket book offers an easy way out of one of the most difficult phases of the fare problem.

Aiding the Claim Department

There is no question that many an accident case is lost by the claim department through the failure to present complete technical evidence, an inexcusable condition when the services and data of the company's engineering staff are so easily available. In fact, it would be well for the claim department to have at least a working knowledge of what the engineering department can supply if necessary. The claim department also should have in its own files dimensioned plans and photographs of all rolling stock. One company carries this practice so far as to make plaster casts of rails and switches at places where derailments have occurred. This renders it possible to determine the exact cause of the accident and is further valuable in the study of truck and wheel behavior. The claim department is justly entitled to a great deal of this kind of information, but as it may require considerable time to gather such data the expense should be charged directly against the damages and accidents account. If this is done the heads of the engineering and shop forces will have no just cause for refusing to co-operate with their legal fellow-workers.

Economy in Car Fittings

Among the annoyances which beset the managements of some city railways is the tendency of a certain element of the public to mutilate the seats, scratch the woodwork and even carry off the smaller brass trimmings. About two years ago, for example, one large city system distributed on half a dozen lines several hundred specimens of its latest type of car. If one should bring together to-day a representative car from each route, the contrast would be so great that no one ignorant of the conditions would believe that all had been placed in service at the same time and maintained according to the same standards. Naturally the query arises as to how far such deterioration can be prevented by using cheaper and plainer fittings without making the cars unattractive when they are operated on the lines which enjoy a more refined and considerate patronage. On some of the lines of the same company the rattan cross seats were so badly cut up and soiled within a few days after their installation that it has been decided to adopt a hardwood slat seat, which is considerably cheaper and more easily cleaned. Slat benches are not the most esthetic objects in the world, but they are certainly more agreeable than rattan or plush seats which perforce have served as foot-mats. Ornate carvings have been almost abolished in city cars, but the use of brass and bronze for trimmings still survives. It seems a pity to discontinue the use of attractive fittings, but in cases where this is necessary it is possible to make them of gilded steel or iron. In this case the first cost of the fittings has been materially lowered and thieving has been made unprofitable.

Another Referendum for Cleveland

The people of Cleveland will vote on Aug. 3 on the Schmidt franchise, either accepting or rejecting the ordinance designed to create a street railway in opposition to the system of the Cleveland Railway Company. The voters thus have an opportunity of taking a step, by rejecting the Schmidt grant, that will be an effective cry for cessation of the political turmoil from which they have suffered for years. By their votes at the referendum of last fall the people showed their weariness of the contest, their disgust at the service given during the low-fare experiment of Mayor Johnson, and their desire that the traction issue should be settled and withdrawn from politics; yet the city is aroused again, and a certain element is excited over promises of a system at a rate of fare which is not adequate to provide proper street railway facilities in a city like Cleveland and could not be permanently successful.

Warren Bicknell, receiver of the Municipal Traction Company and the property of the Cleveland Railway, has stated that 3-cent fare would not be profitable on the entire system operated by the receiver, and that a charge of one cent for a transfer, yielding additional revenue, would not have made operation profitable. In making the computation upon which this conclusion was based Mr. Bicknell multiplied the number of pay passengers each month by three to show what revenue would have been received from transportation of these passengers at 3 cents each, and added the miscellaneous receipts of every character. He found that in no month since the appointment of the receivers would the receipts obtained from 3-cent fare have been adequate to pay the maintenance charges, operating expenses, taxes and bond interest, except in the month of June, and the deficit shown each month would be increased by \$73,378 if any interest was to be paid on the capital investment.

The figures on which this conclusion was based were made public. The largest traffic in any month during the term of the receivers was in June, when 12,443,486 pay passengers were carried, the gross revenue from whom, at 3 cents each, would have been \$373,304. Total expenses and charges in that month were as follows: Maintenance (as provided in lease), \$107,330; operating (actual), \$174,257; general (actual), \$38,970; taxes (actual), \$24,644; interest, bond (actual), \$38,580; Neutral Street Railway rental (actual), \$937. With allowance for interest on the capital investment in the month, there would have been, according to the figures of Mr. Bicknell, a deficit of \$65,516. If one cent had been charged for each transfer issued without refund on presentation of the transfer, the result in June, after allowance for interest on the capital investment, as shown by the table, would have been a deficit of \$22,336.

A summary which accompanies the figures presents the following array of deficits resulting from the application of the low fare unit to the actual traffic: Total deficit, exclusive of interest on capital, for seven months, \$73,353; total deficit for seven months, \$586,999; total deficit if one cent for transfer had been charged, with no refund, for seven months, \$317,624.

After the referendum vote of last fall it was generally

understood that the people of Cleveland had concluded that as between low fare and poor service on the one hand or adequate fare and good service on the other, they preferred good service. It will be extraordinary if the enticing promise of a low rate of fare should lead the residents of that city to approve the Schmidt franchise.

Purchasing Coal by Thermal Specification

We have had several times occasion to mention the increasing frequency of the practice on the part of large consumers, such as great railway companies, of purchasing coal supply on a specification based rigidly on the thermal value of the coal—that is, its actual equivalent in b.t.u. Such is the practice of various departments of the United States Government and other large consumers, and of the big railway companies following the practice may be mentioned: The Interborough Rapid Transit Company, Third Avenue Railroad and Cleveland Railway Company. Of the particular specification used in some of these cases there is direct information in the present issue, but the main question of policy is greater than any details of the requirements. It deals with the wisdom of purchasing fuel upon this basis rather than in the customary way, either without specification of thermal value or by sample or by specification implicitly, although not directly in thermal value. Now it quite goes without saying that the value of coal as fuel depends directly upon its b.t.u. equivalent. Incidentally, the quantities of ash and sulphur contained in the coal act as adverse constituents so far as combustion is concerned. In comparatively early times coal was ordinarily bought merely by weight with specification of the trade designation, which implied roughly a certain grade of fuel. The inadvisability of purchasing large quantities of coal in any such loose way requires no comment, the main question not being whether specifications should be applied to the coal, but what specification. Perhaps the next forward step was a little closer definition of the coal as regards source and character or purchasing on the basis of equality with a certain submitted lot. These steps bring exactness and quality of material bought a little nearer. And a still further improvement in specification has been the purchase of coal on the requirement that its thermal equivalent shall be not less than a certain number of b.t.u.

Now the present b.t.u. specification is a direct outcome of the plan last mentioned. As to the reasonableness of so purchasing coal there can be no dispute since in this way only is it possible for the purchaser to pay for exactly what he gets. B.t.u. specifications as a matter of policy demand first, that the determinations of b.t.u. values shall be reasonably easy and prices so that the criterion can be quickly and fairly applied, and, second, that such specifications cannot be so burdensome to the dealer as to compel him in self-defense to allow a certain margin in price and cover adverse contingencies. As regards the first count we think that it is possible to sample the coal fairly and with sufficient precision and to determine the thermal value without serious difficulty. The method of sampling, for example, adopted by the Third Avenue Railroad Company, as published in our columns, seems entirely fair, consisting as it does of taking a small quantity of coal automatically from the weighing hopper as the coal is being unloaded from the

lighter and accumulating it until 200 lb. has been thus gathered. This quantity is mixed, crushed and quartered in the ordinary routine of sampling and held for addition of similar samples until the lot has been completely dealt with so far as sampling is concerned. This is at least a fair and uniform method.

With respect to the analysis the determining of the b.t.u. equivalent coal is a simple problem of calorimetry, which long experience has shown can be carried out with a very satisfactory degree of precision. The so-called bomb method generally in use is probably as fair as any, as the determinations of ash, sulphur and moisture involve no material difficulties. One must grant then that the determination of thermal equivalent necessary to a fair application of the b.t.u. specification is entirely practicable and not difficult.

This admitted, let us consider the effect of such specification on the price of coal. Either the dealer has quoted a fair price, sufficiently protecting him, with the intention of supplying coal of the grade specified, or he has not. If his price is made with the intention of supplying an inferior article he is an expensive person to deal with at any price and the sooner he is put off the list of bidders the better. If he is dealing squarely in making the contract he should neither lose nor gain by the b.t.u. specification, since, while in occasional lots his price may be cut, it will always be automatically raised on certain other lots of superior quality. The b.t.u. specification then merely requires him to exercise reasonable care in meeting its requirements, and it gives him the advantage which some of the older methods did not, of escaping the unpleasant contingency of having coal thrown back on his hands or accepting a lower price only after annoying litigation.

The coal dealer, at present, has always to assume, if he undertakes to supply coal of a particular grade, that the customer will test that requirement from time to time. Now if his coal falls below grade there are just three things that the customer can do—turn the coal back on the dealer's hands, cancel the contract and try somebody else, or accept the coal at a reduced figure, involving an irritating amount of discussion. None of these things tends to make the business go smoothly and prosperously. On the other hand, if the coal is purchased on b.t.u. specification coal below grade has its price automatically adjusted and coal above grade yields a bonus, as it properly should.

The net result of purchase on the b.t.u. basis, then, is that the customer gets just what he pays for and the coal dealer gets pay for just what he furnishes. If the ordinary contract is squarely taken on the basis of furnishing the article required and getting properly paid for it, then we cannot see that the dealer has anything of which to complain in the b.t.u. specification. The only dealers whom it would hit hard are those who have been counting on furnishing an article below the grade which it is supposed to represent, and these deserve no sympathy and on general principles should be eliminated by a process of natural selection. Hence we are disposed to go squarely on record as believing in the more general application of the b.t.u. specification as being really the only one which provides fair payment for the article furnished without laying for either party a burden worth considering.

WATERBURY EXTENSIONS OF THE CONNECTICUT COMPANY

The Connecticut Company, operating the greater part of Connecticut's electric railway mileage, added last year two important extensions to its Waterbury division. One of these is a line to North Woodbury and the other a line to Thomaston. Both roads are of suburban character, but use the same rolling stock as employed in the Waterbury city service.

WATERBURY TO NORTH WOODBURY LINE

The Waterbury to North Woodbury line, which was



Waterbury Extensions—Steel Girder Bridge Over Highway

completed on Oct. 20, 1908, runs in a westerly direction from Waterbury. It passes through a territory still of great natural beauty and wildness despite the fact that some portions of it were settled over 200 years ago. Woodbury with a prosperous population of 4500 is about 6 miles from the nearest steam railroad. Middlebury, the largest community along the line, has only 1000 inhabitants, while Southbury's 1500 residents must first go by carriage to Woodbury before they can get electric railway transportation to Waterbury.

The construction of this line, of course, has greatly stimulated travel between these towns and Waterbury. People in the latter town have already taken up the commuters' life, but aside from this the Connecticut Company is developing Quassapaug Park, which with its famous lake, a mile square, should be very welcome to Waterbury's 60,000 people. The park is located directly on the line, $1\frac{3}{4}$ miles west of Middlebury and $7\frac{3}{4}$ miles from Waterbury, from whence it can be reached by a 15-cent fare. The hotel at the lake has been greatly improved and furnished with pool and billiard parlors. Among the attractions will be boating, fishing, roller-skating and swings. In anticipation of heavy traffic a loop has been built in front of the park.

During the winter months the schedule is hourly and is handled by two cars taken from the Waterbury city system. These cars are operated with four 40-hp motors and have no difficulty in making time. The seating capacity is about 44, made up of 18 sets of rattan cross-seats and short longitudinal corner seats. As there is no question that the

future traffic, especially in summer, will be much heavier than at present, the turnouts were set for 15 minutes' service. It is quite likely that double headers will be operated as far as the Quassapaug Lake loop. The fare for the 13.2 miles from North Woodbury is 25 cents, including transfer to the Waterbury lines. The pretty brown and white shelter stations, of which two are shown in the accompanying views, form an attractive feature of the passenger service. Express-package service is given on this line by the Connecticut Trolley Express Company.

At the time this line was started the Waterbury system was owned by the Connecticut Railway & Lighting Company. That part of the work from the center of Waterbury to the town line was called the Middlebury extension and the balance the Waterbury & Pomper Valley Railway Company. The entire length of the line is 13.2 miles. The first section, $2\frac{1}{3}$ miles long, was built by C. W. Blakeslee & Sons, New Haven, Conn., and the remainder by Wellington & McCarthy, Boston, Mass. Wm. G. Smith, C. E., Waterbury, Conn., laid out the line and designed the bridges.

The line is on private right of way, but along the highway from the Waterbury town line through Middlebury to the lake, then across country to Woodbury and over the main street of that town to North Woodbury, one-half mile farther. Franchise rights have been ob-

tained also for a 2-mile extension to Hotchkissville. There are no steam crossings on the entire route and only two main highway intersections. The maximum grade on the line is 8 per cent on one stretch of 400 ft. and a 4 per cent to 5 per cent grade extends for 1 mile west of Quassapaug Park. The shortest radius of curvature is 170 ft.

The natural difficulties encountered along different parts



Waterbury Extensions—Shelter Station at Entrance to Quassapaug Lake

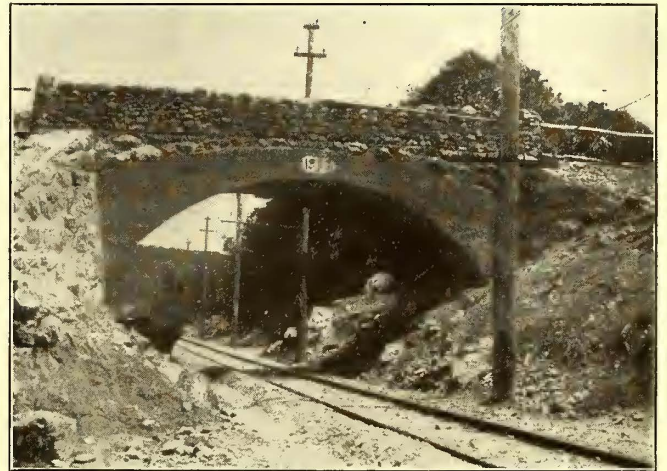
of the route were decidedly opposite in character, calling for rock cuts at the western end and mattresses over peat swamps near Waterbury and just beyond Quassapaug Park. The Waterbury morass, which is over 800 ft. long and 32 ft. deep, has a brush mattress 18 in. to 2 ft. thick extending about 2 ft. on each side of the toe of the slope; a similar mattress has been placed over the other swamp, which is 1200 ft. long and 43 ft. deep. So far these brush foundations have shown no signs of settling.

There are three plate girder bridges over highways as follows: A 29-ft. span at the Waterbury-Middlebury town line; a 40-ft. span over the main highway between Waterbury and Middlebury about $1\frac{1}{4}$ miles west of the 29-ft. span bridge, and a 50-ft. span over the main highway between Middlebury and Woodbury. All of these bridges have cement rubble abutments. The ties are placed directly on the girders. At the undercrossing near the Middlebury station there has been erected a 13-ft. span paneled bridge of reinforced concrete slabs. The floor of this undercrossing is 18 in. thick and is reinforced with 1-in. twisted bars placed 5 in. centers. The panel railings are of concrete reinforced with $\frac{1}{2}$ -in. twisted rods placed 2 ft. centers. The railings were bush-hammered to simulate the appearance of finished stone. The second undercrossing, which is located at Abbotts Four Corners, $1\frac{1}{4}$ miles west from the Waterbury-Middlebury town line, is of entirely different type. It consists of a 36-ft. non-reinforced concrete arch. The wing walls and parapets of this bridge are made of rubble which gives a pleasing rustic appearance to the structure.

The track construction between Waterbury and Woodbury substation is of 80-lb. A.S.C.E. rail and beyond that point a 60-lb. A.S.C.E. rail is used, all connected with six-bolt angle joints and bonded with two No. 0000 concealed bonds. Throughout the entire route the 8-ft. ties are spaced 24 in. centers and laid in gravel ballast. All curves are

no transmission line 35-ft. poles are used. The trolley is No. 0000 grooved wire with flexible bracket suspension and is fed every 1000 ft., the construction being the Connecticut Company's standard for new lines.

Hydro-electric power is transmitted at 33,000 volts from Bulls Bridge, on the Housatonic River, 30 miles to Waterbury, where it is converted to direct current for local feeding and also is stepped down to 11,000 volts for transmission to the Woodbury line substation. The latter is located



Waterbury Extensions—Non-Reinforced Concrete Arch Bridge of 36-ft. Span at Abbott's Four Corners

about 1 mile west of Lake Quassapaug and is of brick, with concrete floor and reinforced concrete roof, and two 300-kw GE rotary converters, each with reactive coil and bank of step-down transformers so interconnected that they can be used in any reasonable combination in case of trouble.

EXTENSION TO THOMASTON, CONN.

The $7\frac{1}{2}$ -mile Thomaston extension from Waterbury was opened on Aug. 3, 1908, with an hourly service. This road was originally projected by the Thomaston Tramway Company, but the lines are now operated from Waterbury by the Connecticut Company. The Thomaston line runs up the Naugatuck Valley, through Waterville to Thomaston and Reynolds Bridge. Thomaston has a population of about 3500 and the contiguous territory about 3500. The cars and track construction standards are similar to those of the North Woodbury extension except that 80-lb. A.S.C.E. rail is used throughout. The maximum grade is 3 per cent and the shortest curve 200 ft. Turnouts are placed every 7000 ft. to make a 15-minute headway possible when needed. The principal structures consist of a 50-ft. span concrete skew arch without reinforcement, two 110-ft. deck spans (which were previously in steam service) over the Naugatuck River, with a 75-ft. through girder bridge with 60-ft. trestle approach over the Naugatuck Railroad and a retaining wall along the Naugatuck River, portions of which are in 20 ft. of water. The 4300 cu. yd. of rubble masonry were laid in 50 days, one derrick handling the stock from the ledge across the highway, while a traveling derrick was employed in direct construction.

In connection with this line 1500 ft. of country road, flooded in times of freshets, were converted into a 60-ft. graveled highway above flood level, and in Thomaston a crooked and narrow street 1600 ft. long was made into a 50-ft. wide boulevard paved with macadam.

The overhead construction is the same as that in use on the Woodbury line, except that there is no transmission.



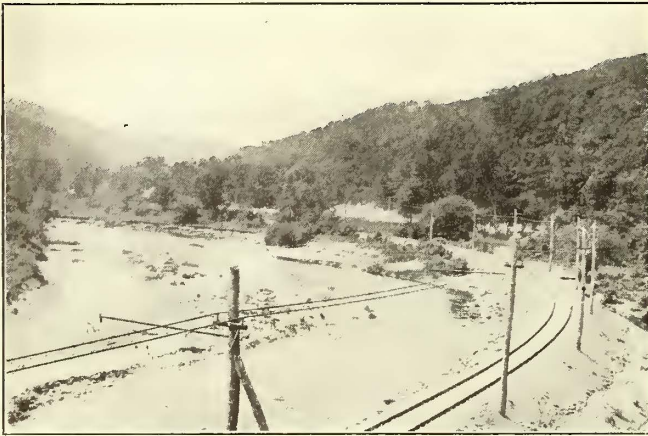
Waterbury Extensions—Reinforced Concrete Slab Bridge, 22-ft. Span, with Middlebury Station in Background

spiraled and protected by guard rails. Sheffield iron cattle guards are in place at all crossings.

The overhead line is carried by chestnut poles with tops at least 22 in. in circumference. Between Waterbury and the substation there is an 11,000-volt transmission line of No. 4 solid copper wire on Crown No. 2 porcelain insulators disposed in an equilateral triangle 40 in. on a side, the top insulator being carried by a pin on a short cross-arm. The poles here are 40 ft. long, but where there is

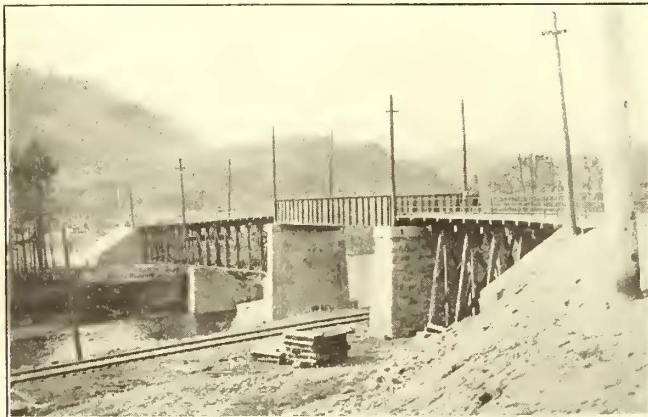
The feeding is done directly from the Waterbury substation at the southerly end of the line, a 120-kw booster compensating for line losses on the upper end.

The construction was done under the direction of the



Waterbury Extensions—View Along the Thomaston Line

engineering department of the New York, New Haven & Hartford Railroad, E. H. McHenry, vice-president; Edward Gagel, chief engineer; C. R. Harte, in charge of trolley construction. Wm. G. Smith, C.E., of Waterbury, located the



Waterbury Extensions—Bridge Over the Naugatuck River

lines and had immediate charge of the work in the field. The contractors for the entire construction were F. T. Ley & Company, Springfield, Mass.

REDUCTION OF CORRUGATION BY WELDING

Electric railway companies in Europe seem to have been more troubled by corrugation of rails than those in this country and have given a great deal of attention to the subject. In a paper recently read by A. Busse, of Berlin, on rail corrugation, it is stated that the electric railway companies in Bremen, Berlin and Hamburg have recently been trying the experiment of welding strips of soft iron to the rail surface to overcome the trouble. The welding is accomplished by means of an electric arc. It is said that the results so far have proved satisfactory and that noisy riding due to the corrugations has disappeared, but the plan has been followed too short a time to determine whether the relief will be permanent.

The Cardiff Corporation Tramways is considering a plan to build a trackless trolley system between Cardiff and Llandaff, Wales.

THIRD AVENUE RAILROAD COMPANY'S SPECIFICATIONS FOR ANTHRACITE COAL

The Third Avenue Railroad Company, New York, has been buying bituminous coal on heat value specifications since July 1, 1908, and it has recently begun the purchase of anthracite coal under a similar set of specifications. The specifications for bituminous coal of this company are the same in all important details as those of the Interborough Rapid Transit Company, of New York, which were printed in abstract in the *STREET RAILWAY JOURNAL* of Feb. 22, 1908, page 284. Many clauses of the anthracite specifications follow closely the practice used in purchasing and testing bituminous coal. The following are the principal provisions:

DELIVERIES

Anthracite coal is to be delivered in self-trimming lighters of from 350-tons to 700-tons capacity at or near the Kingsbridge power house on the Harlem River. Some anthracite coal is purchased for use in the car houses and shops, and this coal is delivered from the contractors' dock in trucks.

GENERAL REQUIREMENTS

The coal covered by the specifications is fresh-mined anthracite, size No. 1 buckwheat. The dry sample of the coal must approximate the standard of 12,150 b.t.u. and show the following constituents on analysis: Carbon, 77.5 per cent; volatile matter, 5 per cent; ash, 17.5 per cent, and sulphur, 1.0 per cent.

Volatile tests are made by using one gram of coal in a platinum crucible held over a Bunsen burner until all flame ceases. When this condition is reached and before any cooling takes place the same is heated over a blast lamp for one and one-half minutes.

METHOD OF SAMPLING COAL FOR ANALYSIS

A small quantity of sample coal is taken automatically from each alternating weighing hopper just before the hopper is dumped while the lighter is being unloaded. These quantities are thrown into a receptacle provided for the purpose until about 200 lb. have accumulated. The bulk of coal thus gathered is crushed and quartered successively to about 10 lb. and placed in a box. The receptacles are then filled again, when the same operation of crushing and quartering is continued until the lighter has been unloaded. The contents of the box are then crushed and quartered to about 2 lb., which, after being pulverized in a mill, is taken for chemical analysis. All samples are dried for one hour at a temperature of from 105 deg. to 110 deg. Fahr.

ANALYSIS AND STANDARD

The analysis of the dry sample taken from the average sample is made by the railroad company's chemist under the supervision of the railway company's engineer. Should the contractor question the results of the test (a copy of which is mailed to him when requested), the railway will within three days after a copy of the test has been mailed to him forward a sufficient quantity of the average sample from each weighing hopper to any New York laboratory mutually agreed upon. The results obtained from this second analysis are final and binding on both parties. In case the questioned values obtained in the railway's analysis are found by the second analysis to be 2 per cent or less in error the cost of investigation is borne by the contractor, but if the disputed values are found to be more than 2 per cent in error the cost is borne by the railway. Should no question regarding the first

analysis be raised by the contractor within three days the average sample of coal will be destroyed at the end of seven days from the date of discharge of coal from the lighter. Any penalties for coal below standard are made according to the table of "reductions" given later and are based as obtained on the second analysis.

All analyses are made in accordance with the standards adopted by the American Chemical Society. The heat value is determined by the Atwater-Mahler bomb calorimeter, which is standardized against cane sugar or naphthalene.

When the lighter is unloaded about 5 lb. of coal is taken from each of the receptacles, to be used for moisture determination. This sample is held and a second analysis made as in the case of the other tests except that the expense must be borne by the contractor should the value questioned be found to vary 10 per cent or less. When coal is delivered in trucks a small quantity is taken from each truck for analysis.

Where the analysis gives amounts for any and all elements in excess of the standard quantities mentioned a reduction in the price per ton will be made in accordance with the accompanying tables of volatile matter, ash and sulphur as well as a reduction for an excess in moisture, plus or minus the amounts above or below the standard b.t.u. values, in addition to any other reductions which may be made.

REDUCTIONS FOR EXCESS OF ASH

For Anthracite Coal in Any Lighter Which Is Found by Test to Contain Per Pound of Dry Coal

Over 18.0 per cent and less than 18.5 per cent.....	2 cents per ton
18.5 per cent and over and less than 19.0 per cent.....	4 cents per ton
19.0 per cent and over and less than 19.5 per cent.....	6 cents per ton
19.5 per cent and over and less than 20.0 per cent.....	8 cents per ton
20.0 per cent and over and less than 20.5 per cent.....	10 cents per ton
20.5 per cent and over and less than 21.0 per cent.....	12 cents per ton
21.0 per cent and over and less than 21.5 per cent.....	14 cents per ton
21.5 per cent and over and less than 22.0 per cent.....	16 cents per ton
22.0 per cent and over and less than 22.5 per cent.....	18 cents per ton
22.5 per cent and over and less than 23.0 per cent.....	20 cents per ton
23.0 per cent and over and less than 23.5 per cent.....	23 cents per ton
23.5 per cent and over and less than 24.0 per cent.....	26 cents per ton
24.0 per cent and over and less than 24.5 per cent.....	29 cents per ton
24.5 per cent and over and less than 25.0 per cent.....	32 cents per ton
25.0 per cent and over and less than 25.5 per cent.....	35 cents per ton
25.5 per cent and over.....	40 cents per ton

REDUCTIONS FOR EXCESS OF VOLATILE MATTER

For Anthracite Coal in Any Lighter Which Is Found by Test to Contain Per Pound of Dry Coal

Over 5.0 per cent and less than 5.5 per cent.....	2 cents per ton
5.5 per cent and over and less than 6.0 per cent.....	4 cents per ton
6.0 per cent and over and less than 6.5 per cent.....	6 cents per ton
6.5 per cent and over and less than 7.0 per cent.....	8 cents per ton
7.0 per cent and over and less than 7.5 per cent.....	10 cents per ton
7.5 per cent and over and less than 8.0 per cent.....	12 cents per ton
8.0 per cent and over and less than 8.5 per cent.....	14 cents per ton
8.5 per cent and over and less than 9.0 per cent.....	16 cents per ton
9.5 per cent and over.....	18 cents per ton

REDUCTIONS FOR EXCESS OF SULPHUR

For Anthracite Coal in Any Lighter Which Is Found by Test to Contain Per Pound of Dry Coal

Over 1.00 per cent and less than 1.25 per cent.....	6 cents per ton
1.25 per cent and over and less than 1.50 per cent.....	10 cents per ton
1.50 per cent and over and less than 1.75 per cent.....	14 cents per ton
1.75 per cent and over and less than 2.00 per cent.....	18 cents per ton
2.00 per cent and over.....	20 cents per ton

If any lighter is rejected by the engineer of the railway on account of excessive coal dust a reduction of 25 cents per ton is made from the price as determined by the b.t.u. value and analysis in accordance with the table of values for the coal taken from that lighter in addition to any other penalties.

Should coal be delivered on other than self-trimming lighters a further reduction of 7 cents per ton is made from the price determined by the b.t.u. value and analysis.

WEIGHTS, TOWING AND DEMURRAGE

The contractor's bill of lading is checked by the scales of the railway company. From the latter's weights are subtracted the amount due to all moisture in excess of 3 per cent. If the railway's weights are less by 1 per cent or more than those on the bill of lading they are substituted for the bill-of-lading weights and all reductions are made therefrom.

No charges are allowed for extra towing or for demurrage unless charges for the latter are presented within one week of the date during which such demurrage occurred. Demurrage is paid only when the lighter ordered by the railway's engineer had been held at the dock for more than five full working days, a working day being taken to mean between the hours of 6 a. m. and 6 p. m., exclusive of Sundays and legal holidays. The price for demurrage is \$5 a day for lighters of not less than 700 tons.

The contractors are required to remove within 12 hours of notification any lighter containing coal which has been rejected on account of an excessive amount of dust; otherwise the railway company is at liberty to have it removed and charge any costs of towing, etc., incidental thereto against the account of the contractor.

PRICE AND PAYMENT

The contract calls for a delivery price on the standard coal. In addition to the penalties for excess of ash, volatile matter and sulphur, an extended table of penalties is included for values above and below the standard heat unit contents of the coal. The standard is 12,101 to 12,150 b.t.u. A penalty of 1 cent for each 50 units below the standard is exacted, and a premium of 1 cent for each 50 units above the standard is allowed. The maximum premium is 26 cents for coal of 13,400 b.t.u. or over, and the maximum penalty is 45 cents per ton for coal of 9900 b.t.u. or less.

HEAT VALUE SPECIFICATIONS FOR COAL

The practice of purchasing coal on a sliding scale of prices based on the heating value and proximate analysis is making headway among large consumers of fuel, and a number of large electric railway companies have adopted this method with satisfactory results during the past two or three years. Among these may be mentioned the Interborough Rapid Transit Company, the Cleveland Railway Company and the Third Avenue Railroad, New York. The anthracite coal specifications of the latter company are printed in abstract above. The specifications of the Interborough Rapid Transit Company for bituminous coal, under which it has been purchasing fuel for several years, have also been employed by the Third Avenue Railroad, as mentioned above, and were printed in abstract in the STREET RAILWAY JOURNAL of Feb. 22, 1908, p. 284. Various departments of the United States Government will purchase during 1909 upward of 611,000 tons of both anthracite and bituminous coal on the b.t.u. basis. It is interesting to compare the requirements of these large consumers as outlined in the specifications used by them.

Heat value specifications for coal are drawn up on the theory that the consumer should pay for the actual heat units in the coal delivered by the dealer, with proper allowances both as to premiums and penalties for variations in the ash, sulphur and moisture content above or below a standard fixed in the contract. For coal high in heat units penalties and premiums for variations of ash and sulphur are not usually necessary, as the high-grade coals are mined in thick seams, and there is little difference between samples taken from two parts of the same seam. The cheaper coals, however, such as slack bituminous and No. 1 or No. 2 buckwheat anthracite, may come from any mine or district, and usually show considerable variations in their analyses. It is these cheap coals which are the most economical to use in the efficient furnaces of large power stations.

If the percentage of sulphur is kept down to a reasonable maximum of, say, 1.5 per cent in bituminous coal and 1 per cent in anthracite, and the percentage of ash is constant, the number of heat units per pound of dry coal is a direct measure of the value of different samples of coal as fuel. An excess of sulphur over the reasonable maximum above named may cause the formation of objectionable clinker on the grate, which impairs the draft and increases the labor of handling the furnaces; hence it is fair to impose penalties for excess percentages at an increasing rate, but as the consumer gains little or nothing in efficiency of the fuel with low sulphur content no premium is usually allowed. The United States Government specifications exact no penalties for excess sulphur and provide no premiums, but a maximum limit is set for each class of coal, which if exceeded may be cause for rejection of the shipment. For anthracite this limit is 1 per cent and for bituminous from 1.5 to 3 per cent. Both the Interborough Company and the Cleveland Railway Company exact penalties on an increasing scale. The penalties of the Cleveland Railway Company, which uses Ohio bituminous slack with a normal sulphur content of 3.5 per cent, begin at 2 cents per ton for sulphur between 4 and 4.4 per cent and range as high as 30 cents per ton for sulphur between 10 and 10.4 per cent. The penalties for sulphur, ash and less than standard heat units are designed to put the price paid for coal 10 per cent below the general standard at a point where only the freight charges are realized on the coal delivered. The Interborough Company's specifications provide for penalties on bituminous coal carrying more than 1.5 per cent of sulphur, the initial deduction being 6 cents per ton for sulphur between 1.50 and 1.75 per cent, and running up to 20 cents per ton for sulphur over 2.5 per cent. For anthracite coal the Third Avenue Railroad exacts sulphur penalties beginning with 1 per cent and running up to 20 cents per ton for sulphur in excess of 2 per cent.

The percentage of ash in coal directly affects the heating value and its behavior in the furnace. The coals which run low in ash have high heat values and create less resistance to the free and uniform passage of air through the grate. There is also a saving in the cost of cleaning fires and disposing of the ashes. So important does the Government consider the percentage of ash in both bituminous and anthracite coal that it provides premiums for coal containing less than the standard fixed, as well as penalties for exceeding the standard. The anthracite specifications provide definite fixed standards of quality for each size of coal based on the ash percentage in "dry coal" instead of on the number of heat units.

The Government standard for No. 1 and No. 2 buckwheat is 18 per cent ash, and an excess of 21 per cent is cause for rejection. The penalties accrue from 19 per cent upward at an increasing rate, beginning at 4 cents per ton for ash between 19.01 and 19.50 per cent and rising to 48 cents for ash between 21.50 and 22 per cent. The premiums, however, accrue at a constant rate of 2 cents per 0.50 per cent, beginning at 4 cents for ash between 16.51 and 17 per cent. The maximum premium is 12 cents per ton. In the Third Avenue Railroad specifications for No. 1 buckwheat the standard ash is fixed at 17.5 per cent, and penalties accrue above 18 per cent. Between 18 and 23 per cent the penalty is 2 cents per ton for each 0.50 per cent excess, and above 23 per cent the penalty is 3 cents for each 0.50 per cent. No premium is allowed for smaller percentages of ash than standard. The percentage of ash

in bituminous coal varies widely in different sizes from different mines or fields. It is not an approximate index of the heating value as in anthracite, and a standard must be fixed for each proposal. In the Government specifications the percentage of ash is used, together with the heat unit content, in comparing competitive bids on the same proposal, and both premiums and penalties are provided for variations in the coal as delivered above and below the standard fixed in the bids. A premium of 1 cent per ton for each whole per cent less ash is paid and an increase of 2 per cent above the standard is allowed without penalty. Above 2 per cent, however, a rising scale of penalties is exacted, beginning at 2 cents per ton for an excess between 2 and 3 per cent and increasing to 18 cents for an excess between 6 and 7 per cent. In comparing two bids on different standards of coal the bids are reduced to cents per 1,000,000 b.t.u. corrected for ash. Thus a coal containing 14,400 b.t.u. and 8.5 per cent ash is bid on at \$4.95 a ton, and another coal containing 14,150 b.t.u. and 14 per cent ash is bid on at \$4.60. Each per cent of difference in ash is valued at 2 cents per ton, increasing the cost of the second coal 11 cents to \$4.71. The two coals can now be compared on the basis of cost of 1,000,000 heating units by the formula $\frac{1,000,000 \times \text{price per ton}}{2240 \times \text{b.t.u.}}$. The first

coal would cost \$0.1534 per 1,000,000 b.t.u., while the second would cost \$0.1451. The second coal, in spite of its lower b.t.u. content and higher percentage of ash, would be the cheapest, provided, of course, the furnace in which it was to be fired was suitable.

In the Interborough Company's specifications the standard ash for good steam caking run-of-mine bituminous coal is 9 per cent, and the penalty attached for exceeding this limit is 2 cents per ton for each 0.50 per cent. No premium for ash percentage lower than this standard is allowed. In Cleveland the specifications provide for Ohio slack with a standard of 15 per cent ash. The penalties are 3 cents per ton for each 1 per cent excess over the standard, and no premiums are allowed.

The Government specifications have been drawn to cover bids on a wide range of bituminous coals, while the railway specifications which are included in the comparison are intended to cover one grade of coal only. The difference in penalties and premiums on ash percentage is explained on this ground. The operating conditions in a railway power station are fairly constant from week to week, and it is desirable to burn coal of uniform quality best adapted to the furnaces in use. The penalties are intended to act as a preventive measure against shipment of coal below the fixed standard of quality, and there is little or no gain in efficiency by using coal of better quality. Hence a premium is perhaps unwarranted.

The moisture in coal as received is beyond the control of the miner, the shipper or the consumer. It affects the weight of the coal, and its presence in excessive quantities also materially affects the steaming quality of the coal, as a considerable part of the heat energy is consumed in evaporating the water which goes up the stack as waste steam intermingled with the gases of combustion. Where it is practicable to weigh coal as delivered, the presence of moisture can be allowed for equitably by determining the heat units per pound of wet coal as a basis of payment. This is the plan adopted by the Government, and it works no hardship on the consumer or the dealer, as the price paid per ton is correspondingly low if the coal is wet and high if the coal is dry. The Cleveland Railway Company, which

is close to the coal fields, makes no provision for excess moisture in its specifications, but uses mine weights and determines the heating value of the coal as delivered from samples taken on the cars. In exceptional cases this might work a hardship on the dealer, but it provides an incentive for delivering fresh, dry coal, which is what is desired from the railway company's standpoint. The Third Avenue Railroad Company deducts from the railway scale weights an amount due to all moisture in excess of 4 per cent with bituminous coal and 3 per cent with anthracite coal, but uses a dry sample for determining the heating value and percentages of ash and sulphur.



Ohio Electric Railway—Toledo Freight and Passenger Stations

The penalties and premiums for variations from the standard heating value of coal show wide differences in the three specifications under consideration. This is the most important element entering into the purchase of coal on the basis of analysis, and must be determined according to the conditions of each source of supply and consumption. The Government specifications, which are drawn on broad lines, provide for a proportionate increase or decrease in the contract price of bituminous coal. If the heating value runs 1 per cent above the standard fixed in the contract, the price, after adjustment for ash, is increased 1 per cent, and vice versa. The heating value is not considered in the purchase of anthracite.

The specifications of the Interborough Company include a table of penalties and premiums based on a fixed value of 1 cent per ton for each 50 b.t.u. above or below the standard of 14,250 for bituminous and 12,150 for anthracite. The maximum premium on both bituminous and anthracite is 26 cents and the maximum penalty is 45 cents.

The Cleveland Railway Company has calculated its table of bonuses and penalties for variations in heating value in connection with the penalties for excess of ash and sulphur so as to incite the dealer to supply coal ranging from the standard of 12,500 b.t.u. up to 13,125 b.t.u., between which range the best profit is yielded, and to prevent delivery of coal more than 10 per cent below standard, on which there is no profit. The maximum premium is 35 cents per ton for coal of 13,975 b.t.u. and above, and the maximum penalty 80 cents per ton on coal below 10,100 b.t.u. One feature of the New York companies' specifications which is not included in the others under review is the limit set on percentage of volatile matter in both bituminous and anthracite coal. Volatile matter may be all combustible, but usually contains some inert gases. Generally speaking, the coal which contains the highest percentage of fixed carbon can be burned most efficiently, and therefore the limiting of the percentage of volatile matter is important, particularly in a city like New York, where there are stringent regulations against smoke production.

THE TOLEDO ENTRANCE AND TERMINAL OF THE OHIO ELECTRIC RAILWAY

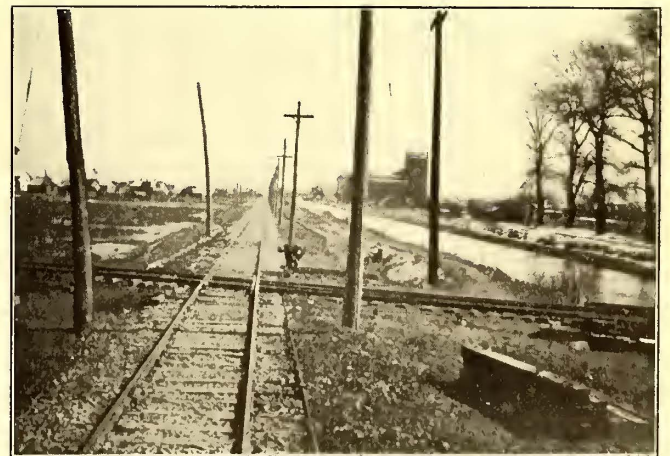
The Ohio Electric Railway early last fall put in service the two new lines which connect up all its lines in Ohio, constituting about 600 miles of lines in that State. The one new line was from Bellefontaine to Lima, and the other from Lima to Toledo. The entrance of the latter line in Toledo is rather unusual in traction construction and location, in that a private right-of-way was secured to within a few blocks of the commercial center of the city. The line lands passengers and freight nearer the heart of the



Ohio Electric Railway—The "Lima Limited" at the Toledo Terminal

city than any steam road, without occupying a foot of city street.

The company has erected a passenger station and a freight station on the terminal property, and has recently established a limited service between Toledo and Lima which, connecting at the latter point with limited service to Fort Wayne, Springfield, Columbus, Zanesville, Dayton, Indianapolis and Cincinnati, offers inducements for many long-haul trips entirely over one electric line. The limiteds between Lima and Toledo make the run of 72½ miles in 2



Ohio Electric Railway—Right-of-Way Along Canal at Toledo

hours and 15 minutes, the same time as the fastest train on the competing steam road. The whole line is laid with 70-lb. T-rail, with Continuous joints, and is ballasted with clean broken stone. There is no curvature over 3 deg., and practically no street tracks in any of the towns along the line. The maintenance charges should be comparatively low, and even faster running time is entirely possible later.

The right-of-way for the tracks approaching the new terminal was purchased about 10 years ago by the Wabash

Railroad interests, but the project which they had in mind was never completed. Therefore the Ohio Electric Railway was able to purchase a portion of this right-of-way leading out of the city. Ample room is provided for double tracking whenever traffic demands. No track is laid in the streets except at highway crossings, and only four streets are crossed at grade within the city. This freedom from crossings is brought about largely by the right-of-

being the parallel-link motion characteristic of the Strauss bascule bridge. The operation of the bridge is effected by racks on the lifting trusses and pinions and gearing on the pivot pier. The usual locks, brakes, signals and operator's house are provided, together with a reserve hand gear. This design is said to permit the use of an ordinary deck-plate girder span of the shortest possible length for a given opening. Lifting trusses can be added at any time when provision must be made for future navigation. Additional spans also may be added on either side of the first span without disturbing the earlier work.

This new line furnishes for Toledo a high-speed suburban as well as long-distance interurban line which has few equals in any city of its size in the country.

MODIFIED MERIT SYSTEM IN LITTLE ROCK

A modified system of awarding merits and demerits has been established on the railway lines of the Little Rock Railway & Electric Company, Little Rock. During the time in which it has been in operation, since April 1, 1909, it has proved very satisfactory, and, according to D. A. Hegarty, general manager, has been followed by marked increase in the efficiency of the force. The novel feature of the system lies in the fact that the merits and demerits are awarded by a jury in which the employees are represented.

The schedule of merits and demerits does not differ greatly from that on other roads. There are only seven faults for which there is immediate discharge, namely: disobedience of rules governing railroad crossings, disloyalty to the company, false statements, intoxication, dishonesty, gambling and gross ungentlemanly conduct. A schedule of the demerits and merits shows that the former vary from 1 to 100 and the latter from 1 to 50. Originally these merits and demerits were assessed by a board of inquiry, consisting of the general manager, the superintendent of the railway department, the superintendent of transportation and the claim agent. On April 1, however, the company decided to add to this committee two motormen and two conductors, who are chosen by the men at large. This jury has charge of all of the cases except those relating to the appropriation of fares, and assesses all merits and demerits to motormen and conductors after a consideration of the evidence.

The jury meets every Friday morning, and the employees on the jury are paid for their time while engaged in jury work at the same rate as if they were operating a car. When any case for the award of merits or demerits arrives, the employee affected is notified in writing of the fact, with the reason, and is given opportunity to appear before the committee to explain his side of the case, if he desires. After the marks are awarded, a notice is posted on the bulletin board announcing the marks given, the charge, the date and the decision, but the name of the man and the car number are omitted, although the man himself is notified personally by mail. When an employee's demerits have reached the number of 90, he is called in by the superintendent and cautioned and advised; when they amount to 100, he is subject to dismissal from the service. Employees are permitted to examine their record at any time. Five merits are awarded all railway employees who pass a month without demerits.

To encourage interest in making a good report a prize of \$25 is awarded every six months to each conductor and each motorman having the best record.



Ohio Electric Railway—Lift Bridge at Toledo, Entrance Open

way being parallel to that of the Miami & Erie Canal, across which very few streets have been opened. The most severe grade in the Toledo entrance is a dip of $2\frac{1}{2}$ per cent through a subway. The terminal buildings comprise a freight house and a passenger station. The passenger station includes waiting rooms, baggage room, ticket office and employees' room. The two buildings are separated by a driveway.

An interesting feature of the private right-of-way entrance to Toledo is the bascule bridge across Swan Creek. This bridge was erected by the Strauss Bascule Bridge Company, and comprises three deck-plate girders, two approach spans of 64 ft. and one channel span of 73 ft. 6 in.



Ohio Electric Railway—Lift Bridge at Toledo, Entrance Closed

The latter has each of its two cross-frames extended to a rigid connection with a lifting truss on either side. These lifting trusses are mounted on trunnions resting on the pivot pier, and are counterweighted with a block of reinforced concrete carried on the steel frame. This weight supporting the frame is pin-connected to the lifting trusses at the end and is held by a link at the top, the arrangement

MEETING OF COMMITTEE ON POWER DISTRIBUTION

A meeting of the committee on power distribution of the American Street & Interurban Railway Engineering Association was held July 23 at the headquarters of the association, 29 West Thirty-ninth Street, New York. Those present were James Heywood, Philadelphia Rapid Transit Company (chairman); W. J. Harvie, Utica & Mohawk Valley Railway; G. W. Palmer, Boston & Northern Street Railway Company, and E. J. Dunne, Public Service Railway Company, Newark, N. J. The two other members of the committee, S. L. Foster, United Railways of San Francisco, and W. G. Matthews, Denver City Tramway Company, were unable to be present, but both have greatly assisted the committee by sending discussions on the subjects being considered this year. These communications will be embodied, in part, in the final report. The meeting last week was called by Chairman Heywood so that the committee could finally consider and prepare the recommendations to be presented at the Denver Convention.

The work carried on by the committee this year has been a continuation of that conducted by the previous committee on the same subject, and in its report the committee will follow the outline of topics adopted in last year's report, but some additions have been made to that list.

The first subject considered in the report this year will be that of underground and overhead feeder cables for both high-tension and low-tension current and the best methods of protecting them from lightning. The committee will go quite extensively into the requirements of design of high-tension transmission towers. In this portion of the report the committee will also discuss the possibility of rehabilitating paper-insulated low-tension cables, and will describe a furnace in which the metal in these cables can be economically recovered if the cables have to be scrapped. In connection with the discussion of lightning protection the committee has secured some valuable data from member companies in the Far Western States. This section of the report will be accompanied by five appendices: Appendix A is an outline specification for high-tension, three-conductor, paper-insulated, lead-sheathed underground cable. Appendix B is a specification for rubber compound insulation. The specification to be included in Appendix B covers only the physical and chemical properties of the rubber compound to be used for insulation, and does not refer to the thickness of insulation on wires or to specifications for braiding. Appendix C will consist of a discussion by S. L. Foster of San Francisco, who is a member of the committee, on some features of moderately high-tension transmission in California. Appendix D is a specification for low-tension underground feeder cables. Appendix E is a discussion on the general subject of lightning protection by J. V. E. Titus.

The second portion of the report will be devoted to the subject of working conductors, and will include a discussion of the merits of different sections and sizes of trolley wire. The committee has had under consideration a number of specifications for trolley wire, but in the limited time at its disposal was unable to prepare a satisfactory specification to be submitted for adoption by the association, and it will only report progress in this direction.

Following the discussion on trolley wire, the report will take up the most desirable forms of overhead line material. In this connection Appendix F will be submitted, in which will be given the results of a series of tests of overhead line materials supplied by different manufacturers which have recently been conducted under the auspices of the

committee. Samples of various forms of overhead line material were obtained from seven manufacturers, and these were subjected to mechanical tests both at normal temperatures and when heated to 150 deg. Fahr., and to electrical tests, both dry and either saturated or under precipitation of moisture. The second section of the report will be concluded with an extended discussion of the different methods of preserving wooden poles from decay and of reclaiming both wooden and iron poles.

The third section of the report relates to the improvements in catenary construction developed since the report of last year was prepared. In its treatment of this topic the committee will give a comparison of the relative costs of bridge and pole catenary construction with that of the ordinary type. The committee will present some general recommendations as to good practice in the details of catenary construction.

Under the heading "Return System," the report will discuss the most desirable type of bonds to use with T and girder rails, the proper method of testing bonds and other problems in connection with the laying and maintenance of return circuit cables. The report will conclude with a carefully prepared discussion of duct, conduit and manhole construction, accompanied by drawings of two-way and four-way manholes of a type approved by the committee and also by a complete outline specification covering the purchase and laying of tile conduit, which will be designated as Appendix G.

SPECIFICATIONS FOR HEAT TREATED AXLES

At the meeting of the committee on equipment of the American Street & Interurban Engineering Association held in Cleveland on July 19 and 20 the preparation of tentative specifications for heat-treated axles was assigned to J. S. Doyle, superintendent of car equipment of the Interborough Rapid Transit Company, New York, who is a member of the committee. In order to obtain the views of steel manufacturers, Mr. Doyle called a meeting at the office of the association, 29 West Thirty-ninth Street, New York, on the morning of July 22. Besides Mr. Doyle, who acted as chairman, those present at the meeting were: George William Sargent, Carpenter Steel Company; F. W. Weston, Standard Steel Company; A. A. Stevenson, Standard Steel Works; W. A. Bostwick, Carnegie Steel Company; E. A. C. Acker, Bethlehem Steel Company; H. L. Waterman, Cambria Steel Company, and Norman Litchfield, Interborough Rapid Transit Company. Mr. Barba, of the Midvale Steel Company, to whom an invitation had been extended, was unable to be present.

Mr. Doyle explained that the object of the conference was to agree, if possible, upon the principal requirements of a specification for heat-treated axles to be used on electric motor trucks carrying motors of 100 hp and over. This would include the types EC-1 and ED of the standards already adopted by the American Street & Interurban Railway Engineering Association. He called attention to the fact that axle failures have been experienced by a number of electric railway companies during the past few years, and he expressed the belief that the time was opportune for bringing to the attention of the railway companies in general the desirability of using treated steel for axles of heavy motor trucks.

The representatives of the steel manufacturers agreed that the following requirements could be met in the manufacture of treated axles without undue difficulty:

1. All axles for this class of service should be forged

of open-hearth steel made either by the acid or basic process.

2. Maximum limit of phosphorus, 0.04 per cent for basic steel and 0.05 per cent for acid steel.
3. Maximum limit of sulphur, 0.06 per cent.
4. Maximum limit of manganese, 0.80 per cent.
5. Discard from the top ingot sufficient to insure freedom from piping and undue segregation.
6. Tensile strength, 80,000 lb. per square inch.
7. Yield point, as measured by the drop of the beam, 45,000 lb. per square inch.
8. Elongation in 2 in., 22 per cent.
9. Reduction of area, 40 per cent.
10. All steel axles should be allowed to cool after forging, then reheated to the proper temperature, quenched in some medium, again allowed to cool, and then reheated to the proper temperature for annealing.

At the request of Mr. Doyle, the representatives of the steel manufacturers present at the meeting expressed a willingness to prepare for the committee brief statements of their views on the value of heat treatment of steel to be used in axles, to be incorporated in its report.

MEETING OF THE COMMITTEE OF EQUIPMENT

A meeting of the committee on equipment of the American Street & Interurban Railway Engineering Association was held at the Hollenden Hotel, Cleveland, Ohio, on July 19 and 20. The members of the committee who were present were: L. L. Smith, master mechanic of the Chicago & Milwaukee Railway Company, chairman; M. V. Ayres, of the Boston & Worcester Street Railway Company, and L. W. Jacques, of the Fort Wayne & Wabash Valley Traction Company. Others in attendance were: Paul Winsor, of Boston, president of the association; W. H. Evans, of Buffalo; A. A. Stevenson, vice-president of the Standard Steel Works, and M. R. Hanna, representing the General Electric Company.

The first subject considered was the subject of standard wheels. Mr. Stevenson stated that in spite of the large number of sections in use, his company had been able to confine all recent orders, some several hundred in number, to within a dozen different sections. This was done by showing the customers how their needs could be supplied by wheels that are of standard size at less money than it would cost to make the wheels of special dimensions.

The shape of the flange was also discussed exhaustively, both by the members of the committee and the visitors. It was suggested that there should be more metal in the flange than in the standard adopted two years ago, because of the wear from the guard rails. It was also suggested that the cone of the standard type of the wheel tread might be increased from the present standard of 1 in 25 to 1 in 20. Several of those present maintained that many roads change the taper on the first turning or grinding of the wheels to 1 in 20, so there is no good reason for not using that taper originally. It was finally decided, however, not to make any change this year. The discussion brought out the fact that the average number of turnings of rolled-steel wheels is three. Some wheels have been known to run 150,000 miles on one turning, but the average is 45,000 miles. An interesting claim made during the discussion on wheels was that thick rims increase the weight of the wheel to such an extent that the cost of hauling the wheels is about equal to the cost of the wheels. The belief was expressed by one engineer that light wheels with one life will be more economical than the heavy ones that will stand

turning several times. The following suggestions as to wheels were brought up:

Diameter.	Thickness of Rim.	Diameter of Hub.
33 in.	2½ in.	5½ in.
34 in.	3 in.	6 in.
35 in.	3 in.	6 in.
36 in.	2½ in.	6 in.
37 in.	3 in.	6 in.

Flanges:
 1 3-16 x 3-4 with 2 1-2 in. tread.
 1 3-16 x 7-8 with 3 in. or 3 1-2 in. tread.

Chairman L. L. Smith read a communication from W. H. McAloney, member of the committee and superintendent of rolling stock of the Denver City Tramway Company, on the subject of "Economical Maintenance." The writer touched upon almost every important phase of electric railway operation, and recommended a number of features he believed will prove of benefit. This communication will be made a part of the report of the committee.

L. W. Jacques read a paper, compiled principally from the data sheets received, on "Rolled-steel vs. Steel-tired Wheels." The experience of many roads was given, and some amusing stories were related.

RAIL GRINDER OF ALBANY & HUDSON RAILROAD

The accompanying illustration shows a rail grinder which was recently devised by the Albany & Hudson Railroad Company for grinding down the wing rails of frogs to permit smoother passage of the car wheels. The grinder also will be used to improve the condition of the rail joints on the local lines in Hudson, N. Y. All of the wing rails on the frogs located on the main line between Albany and Hudson have been ground down with this machine at a cost of 28 cents per frog. The emery grinder is driven at a speed of 1900 r.p.m. by a 500-volt, 7½-hp motor, which is unnecessarily large for the work.

It will be noticed that this device is carried on an ordinary track section car. The motor frame is mounted on a



Grinding the Wing Rails of Frogs on the Albany & Hudson Railroad

movable wooden base, which can be shifted from one side of the car to the other to reach the work on either rail. The hinged frame which is suspended from the top of the fixed frame carries a shaft and double pulley at each end. The frame carrying the emery wheel is hinged at the bottom of the upright swinging frame and is held in a horizontal position by a spring suspended from the stationary frame. The pressure against the rail is supplied by the operator. As the belt centers are constant, the emery wheel has a movement of from 2½ ft. to 3 ft. along the top of the rail. The framework is of the folding type, and can be prepared for removal to another location in from one to two minutes. The entire machine is moved and operated by three laborers.

Acknowledgments are due to R. H. Smith, general manager of the company, for the data in this article.

AMERICAN ASSOCIATION MEMBERSHIP CIRCULARS

The American Street & Interurban Railway Association is continuing its vigorous campaign to procure new members. It recently sent circulars and application blanks for associate membership to the managers of all the tramway companies in Europe and foreign countries, and has already received two applications. It is hoped that a large number of the foreign tramway officers will take advantage of the invitation extended to them to become members.

The secretary's office has also sent out to all street railway companies in the United States circulars pointing out the advantages of membership in the association, and enclosing application blanks. The application blank for active membership has attached a table headed "A Case of Non-Support," and is directed primarily to railway companies in the Western States. The table gives the number of member companies and non-member companies in each of 16 States west of the Mississippi River, and shows a total of 67 member companies and 128 non-member companies. Below the table is printed the following urgent appeal: "You need your convention as much as it needs you. Reverse these totals and insure its success."

The application blank for associate membership states briefly what privileges are accorded to members and the cost of membership. The privileges may be summarized as follows: Privileges of the annual conventions; attendance at meetings of the Engineering and Transportation & Traffic associations and participation in their discussions; receipt of all papers and committee reports of the Engineering Association 30 days in advance of the convention; one cloth-bound copy of the proceedings of the Engineering and Transportation & Traffic associations, 900 pages; privilege of wearing associate membership emblem.

Another circular which has been sent out with the application blanks is headed "Cost vs. Return." This gives in parallel columns the cost of company membership and the benefits to be derived from membership. Each association is considered separately, and the scope of its work is outlined. The titles of this year's committees, with the number of their members, are also given.

The field of the American Association covers matters of general welfare, public policy, etc. Its committees include those on insurance, six members; welfare of employees, 4; compensation for carrying U. S. Mail, 5; municipal ownership and public relations, 13; Interstate Commerce Commission affairs, 5; a total of 38.

The Accountants' Association considers accounting questions, standardization of accounts, reports, etc. Its committees include one on shop accounting (jointly with the Engineering Association committee), 3 members; collection of blanks and forms, 1; international standard form of report, 3; standard classification of construction and equipment accounts and form of report, 5; interline accounts, 3; a total of 15.

The Engineering Association considers engineering questions, covering the construction and maintenance of electric railway equipment and apparatus, standardization, etc. Its committees include those on standards, 9 members; equipment, 6; way matters, 6; power generation, 6; power distribution, 6; shop accounts (jointly with the Accountants' Association), 3; a total of 36.

The Claim Agents' Association concerns itself principally with the organization of the details of the work of reducing the "damages" account. This year it has only two committees, one on employment of 3 members and one on ways and means, 4 members; a total of 7.

The Transportation & Traffic Association deals with general operating methods and details. The committees are those on interurban rules, 6 members; city rules, 6; passenger traffic, 6; express and freight traffic, 6; training of transportation employees, 6; transfers and transfer information, 6; a total of 30.

The total number of committees is 24, and the total membership 132. Other benefits to be derived by company membership in the association include participation of officers in all convention meetings and discussions; cloth-bound copies of proceedings, 1650 pages; monthly statistical bulletins; clearing house for electric railway information; opportunity of viewing the convention exhibits.

The number of member companies in the association is the best indication of the claim that value is received for the membership dues. At the time this circular was prepared there were 300 member companies, having total capital liabilities of \$2,148,272.441; gross income, \$290,784.299; single-track mileage, 19,586; cars owned, 60,505.

The association is also endeavoring to interest as many of its members as possible in the coming Denver convention, and has prepared a small card giving a few reasons why the attendance this year should be as large as in previous years. Some of these reasons are: That Denver is 1500 miles from San Francisco and but 2000 miles from New York; it takes 48 hours from San Francisco to Denver and only 47 hours from New York to Denver; 20 per cent of the active members of the association are located west of the Mississippi River; 20 per cent of the companies represented at the 1908 convention held at Atlantic City, N. J., came from west of the Mississippi River. The only convention of the association ever held west of the Mississippi River was in Kansas City in 1900.

PROGRAM FOR CONVENTION OF ACCOUNTANTS' ASSOCIATION

President Robert N. Wallis of the American Street & Interurban Railway Accountants' Association has announced the tentative program for the convention to be held at Denver during the week beginning Oct. 4.

Papers will be read by the following: W. B. Brockway, "Relation of the Accountant to Electric Railway Organization;" E. S. Pattee, Twin City Rapid Transit Company, "Storeroom Accounting and Inventory;" N. E. Stubbs, United Railways & Electric Company, of Baltimore, "Time-keeping and Payrolls;" S. C. Rogers, treasurer, Mahoning & Shenango Railway & Light Company, "Interurban Statistics;" W. M. Steuart, United States Census Bureau, "The Census and Electric Railway Statistics."

Reports will be presented to the association by the committee on interline accounts, the classification committee, and from the joint committee of the Accountants' and Engineering associations, each of which will undoubtedly provoke a great deal of discussion.

ROUTING OF SPECIAL CONVENTION TRAINS TO DENVER

It has been announced that the special train to the convention at Denver leaving New York over the New York Central & Hudson River Railroad will run via the Lake Shore from Buffalo to Chicago, and over the Chicago, Rock Island & Pacific Railroad from Chicago through to Denver. The other special train from New York, over the Pennsylvania Railroad, will run from Chicago to Denver via the Chicago, Burlington & Quincy Railroad.

CAMPAIGN OF THE CITIZENS' COMMITTEE OF CLEVELAND

The citizens' committee of one hundred of Cleveland is conducting a strenuous campaign against the Schmidt franchise, the measure by means of which Mayor Johnson and his associates hope to be in a position to build another road to compete with the system of the Cleveland Railway. A referendum on the Schmidt ordinance will be held on Aug. 3. Tent meetings are being held and literature circulated by the citizens' committee and by the Johnson supporters.

A series of circulars has been issued by the citizens' committee. No. 1 says in part regarding the Schmidt franchise:

The franchise given to Herman Schmidt and his assigns provides that the rate of fare for each passenger over six years of age, from the intersection of Payne Avenue and Superior Avenue to East Fifty-fifth Street (Willson Avenue), shall be 3 cents. There is no provision that a passenger shall be carried upon any extension of said line for the 3 cents.

It in express terms releases Schmidt and his assigns

To vote against the Schmidt franchise mark your ballot thus:

<p>ORDINANCE No. 15040 ENTITLED: "An Ordinance granting to Herman Schmidt, his heirs, legal representatives and assigns, the right to construct, maintain and operate a street railroad in Payne Ave. N. E., between its intersection with Superior Ave. N. E. and E. 55th St.</p>	<p>THE SCHMIDT-JOHNSON plan provides 13-cent, 8-cent, 6-cent, 5-cent and 3-cent fare on various lines in the city. The Tayler plan provides IMMEDIATE 3-CENT FARE on EVERY car line in the city. The Tayler plan provides for GOOD SERVICE AT COST with NOT MORE than 6% interest on the money invested. The Tayler plan gives the people absolute control of the service and the rate of fare; and the operating company MUST at ALL TIMES give THE PEOPLE the kind of SERVICE they require.</p> <p><i>You cannot get an opportunity to vote on the Tayler plan and IMMEDIATE 3-cent fare EVERYWHERE unless you vote down the Schmidt franchise on August 3rd.</i></p>
<p>FOR THE FRANCHISE.</p>	
<p><input checked="" type="checkbox"/> AGAINST THE FRANCHISE.</p>	

Circular Issued by Citizens' Committee Showing Method of Voting Against Franchise

from paying for the repaving of 16 ft. of the street, as required by the general ordinances of the city.

It does not give the city any control over the service or management of the property.

It does not limit the profits from operation to 6 per cent, or any other sum.

It does not limit the capitalization of the company to the physical value of the property, or to any sum.

Acting under the laws governing original grants, the City Council advertised for bids on 14 routes, requiring deposits of cash amounting to \$255,000. Of the 14 original routes thus advertised one was granted to Herman Schmidt and assigns, that being the Payne Avenue route described. The deposit required on this grant was but \$18,000.

From this original Payne Avenue grant it is proposed to give Schmidt and his assigns the right to build extensions, thus evading the law governing the granting of original routes to the lowest responsible bidder and defeating its purposes.

The Schmidt-Johnson plan means continual street railway warfare, with disordered service and many different rates of fare, varying from 3 cents to 13 cents, or more.

The citizens' committee of 100 urges the defeat of the Schmidt franchise on Aug. 3, and of any other franchise the City Council may grant which aims to renew the disastrous street railway war, and they demand a referendum election on Judge Tayler's plan for street railway settlement, which insures immediate 3-cent fare on all lines and the best terms ever given to the people in any city in the world.

In circular No. 2, discussing "Three-cent Fare or Thirteen-cent Fare," the citizens' committee said:

As long as he can prevent it, Mr. Johnson will not permit the people to vote on any franchise unless it is granted to his friends or associates; he will not put the whole question squarely before the people by submitting the Tayler plan to a referendum, because Mr. Johnson proposes

to obstruct any settlement of the street railway question just as long as the people allow him to do so, unless he can again secure control of the properties for himself and his friends.

No. 3 in the series was entitled "Valuation," and showed the details of the valuation placed upon the properties of the Cleveland Electric Railway and the Forest City Railway by Mayor Johnson and F. H. Goff, as follows:

Description	Per mile Cleve. Electric property	Per mile Forest City property
Tracks	\$16,926.50	\$29,292.23
Pavement	7,665.92	8,293.12
Cars	11,735.25	30,325.01
Land	5,953.34	1,036.89
Buildings, except power and battery houses	3,754.95	2,247.00
Overhead construction and return circuits	4,914.78	9,862.14
Power stations and buildings therefor	9,875.24	11,038.75
Storage batteries and buildings therefor	1,291.15	4,007.61
Shops, shop stores, tools, rails, ties and track	1,902.33	2,652.71
Miscellaneous, rolling stock and equipment	689.38	342.70
Miscellaneous: Accounts receivable, office furniture, etc.		2,942.79
Overhead charges: Organization, construction interest, salaries of general officers, etc.	3,160.49	4,731.03
Items not covered by physical value schedules	31,846.76	13,283.24
Cost per mile	\$98,816.09	\$120,055.22

The committee said in this circular that Mayor Johnson had declared that the Forest City property would be built and equipped for \$50,000 per mile, whereas, when the sale took place, he claimed that the real cost was \$120,000 per mile.

In circular No. 4, dealing with "Service," the committee states that the object of the Schmidt-Payne Avenue franchise is to force a return to the holding company plan, while "the Tayler plan means immediate 3-cent fare over every car route in Cleveland, with good service at cost, and always under the control of the people." It adds:

As a matter of fact and figures, on Aug. 8, 1908, investigations made by the *Press* and the *News* showed there were lying idle during the rush hours in the various barns of the company 230 cars, or 25 per cent of all the company owned, although August is the busiest month in the year. While men, women and children were being packed in cars like cattle, 25 per cent of the equipment was lying idle!

No. 5 in the series, discussing transfers, states: "About 30 per cent of Cleveland car riders now use transfers. If the railway system is divided between two companies, many people will have to pay two fares who now ride on free transfers."

The American Railway Association has appointed the following committee on electrical working, which will investigate and report on the progress made in the electrification of steam railroads: George Gibbs, chief engineer of electric traction, Long Island Railroad, chairman; L. C. Fritch, consulting engineer, Illinois Central, J. F. Deems, superintendent of motive power, New York Central lines; J. D. Isaacs, consulting engineer, Union & Southern Pacific system; W. J. Harahan, assistant to the president, Erie Railroad; C. S. Sims, second vice-president, Delaware & Hudson, and E. H. McHenry, vice-president, New York, New Haven & Hartford.

SPECIFICATIONS FOR HARD-DRAWN COPPER WIRE

At the annual meeting of the American Society for Testing Materials, held in Atlantic City, N. J., June 29 to July 3, 1909, Committee W presented proposed standard specifications for hard-drawn copper wire, including round wire, grooved trolley wire and cable or standard wire. These specifications were received without discussion and ordered submitted to letter ballot for adoption by the society. The result of this ballot has not yet been announced. The committee which prepared the specifications consisted of the following:

J. A. Capp, General Electric Company, chairman; W. H. Bassett, American Brass Company; J. F. Finley, American Steel & Wire Company; H. J. Horn, John A. Roebling's Sons Company; C. C. Baldwin, Standard Underground Cable Company; O. A. Havill, Viele, Blackwell & Buck; F. W. Wallace, Waclark Wire Company; C. Crossland, Western Electric Company; T. D. Lynch, Westinghouse Electric & Manufacturing Company; C. D. Gray, J. G. White & Company.

The text of the specifications as presented and the explanatory notes of the committee are reprinted in full below:

PROPOSED STANDARD SPECIFICATIONS FOR HARD-DRAWN COPPER WIRE

1. The material shall be copper of such quality and purity that, when drawn hard, it shall have the properties and characteristics herein required.
2. These specifications cover hard-drawn round wire, grooved trolley wire and hard-drawn cable or strand, as hereinafter described.
3. The wire, in all shapes, must be free from all surface imperfections not consistent with the best commercial practice.
4. (a) Package sizes for round wire and for cable shall be agreed upon in the placing of individual orders; standard packages of grooved trolley wire shall be shipments upon reels holding about 2500 lb. each.
(b) The wire shall be protected against damage in ordinary handling and shipping.
5. For the purpose of calculating weights, cross-sections, etc., the specific gravity of copper shall be taken as 8.90.
6. All testing and inspection shall be made at the place of manufacture. The manufacturer shall afford the inspector representing the purchaser all reasonable facilities to enable him to satisfy himself that the material conforms to the requirements of these specifications.

HARD-DRAWN ROUND WIRE

7. (a) Size shall be expressed as the diameter of the wire in decimal fractions of an inch, using not more than three places of decimals; i.e., in mils.
(b) Wire is expected to be accurate in diameter; permissible variations from nominal diameter shall be:
For wire 0.100 in. in diameter and larger, 1 per cent over or under.
For wire less than 0.100 in. in diameter, 1 mil over or under.
(c) Each coil is to be gaged at three places, one near each end, and one approximately at the middle; the coil may be rejected if, two points being within the accepted limits, the third point is off gage more than 2 per cent in the case of wire 0.064 in. in diameter and larger, or more than 3 per cent in the case of wire less than 0.064 in. in diameter.
8. The wire shall be so drawn that its tensile strength and elongation shall be at least equal to the values stated in the following table. Tensile tests shall be made upon fair samples, and the elongation shall be determined as the permanent increase in length, due to the breaking of the wire in tension, measured between bench marks placed upon the wire originally 10 in. apart. The fracture shall be between the bench marks, and not closer than 1 in. to either mark. If, upon testing a sample from any coil of wire, the results are found to be below the values stated in

the table, tests upon two additional samples shall be made, and the average of the three tests shall determine acceptance or rejection of the coil.

Diameter, inches	Area, circular mils	Tensile strength, lbs. per sq. in.	Elongation in 10 in. per cent
0.460	211,600	49,000	2.7
0.410	168,100	51,000	2.6
0.365	133,200	53,000	2.4
0.325	105,600	54,500	2.3
0.289	83,520	56,000	2.1
0.258	66,560	57,500	2.0
0.229	52,440	58,500	1.9
0.204	41,620	59,500	1.8
0.182	33,120	60,500	1.7
0.162	26,240	61,500	1.6
0.144	20,740	62,500	1.5
0.128	16,380	63,400	1.4
0.114	12,996	64,200	1.3
0.102	10,404	64,800	1.2
0.091	8,281	65,400	1.1
0.081	6,561	65,700	1.0
0.072	5,184	66,000	0.9
0.064	4,096	66,200	0.9
0.057	3,249	66,400	0.8
0.051	2,601	66,600	0.8
0.045	2,025	66,800	0.7
0.040	1,600	67,000	0.7

For wire whose nominal diameter is between listed sizes, the requirements shall be those of the next larger size included in the table.

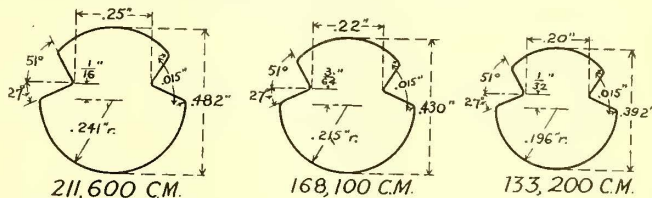
9. Electric conductivity shall be determined upon fair samples by resistance measurements at a temperature of 20 deg. C. (68 deg. F.). The wire shall not exceed the following limits:

For diameters 0.460 in. to 0.325 in., 900.77 lb. per mile-ohm at 20 deg. C.

For diameters 0.324 in. to 0.040 in., 910.15 lb. per mile-ohm at 20 deg. C.

GROOVED TROLLEY WIRE

10. Standard sections shall be those known as the



American Standard Sections for Grooved Trolley Wire

“American Standard” grooved trolley wire sections, the shape and dimensions of which are shown in the accompanying drawing.

11. (a) Size shall be expressed as the area of cross-section in circular mils, the standard sizes being as follows:
211,600 circular mils, weighing 3386 lb. per mile.
168,100 circular mils, weighing 2690 lb. per mile.
133,200 circular mils, weighing 2132 lb. per mile.

(b) Grooved trolley wire may vary 4 per cent over or under in weight per unit length from standard, as determined from the nominal cross-section.

12. The physical tests shall be made in the same manner as those upon round wire. The tensile strength of grooved wire shall be at least 95 per cent of that required for round wire of the same sectional area; the elongation shall be the same as that required for round wire of the same sectional area.

13. The requirements for electric conductivity shall be the same as those for round wire of the same sectional area.

HARD-DRAWN COPPER WIRE CABLE OR STRAND

14. For the purposes of these specifications, standard cable shall be that made up of hard-drawn wire laid concentrically about a hard-drawn wire center. Cable laid up about a hemp center or about a soft wire core is to be subject to special specifications to be agreed upon in individual cases.

15. The wire entering into the construction of stranded

cable shall, before stranding, meet all the requirements of round wire, hereinbefore stated.

16. The tensile strength of standard cable shall be at least 90 per cent of the total strength required of the wires forming the cable.

17. Brazes, made in accordance with the best commercial practice, will be permitted in wire entering into cable; but no two brazes in wire in the cable may be closer together than 50 ft.

18. The pitch of standard cable shall be not less than 12, nor more than 16, diameters of the cable. The cable shall be laid left-handed or right-handed, as shall be agreed upon in the placing of individual orders.

EXPLANATORY NOTES ON PROPOSED SPECIFICATIONS FOR HARD-DRAWN COPPER WIRE

5. The specific gravity of copper has been commonly accepted as 8.9, and this value is retained in the proposed specifications. The maximum variation from this figure in a large number of samples of wire has not been sufficient to lead one to anticipate any serious error from its use as a flat value in calculations.

7. (a) The use of arbitrary gage numbers to express dimensions cannot be too strongly condemned. There are many such gages in existence, and confusion is to be expected unless the particular gage to be used is specified. Many of the gages have their dimensions stated in absurd figures, such as 0.090742 in., when it is not especially easy to measure dimensions in the fourth decimal placed by workshop tools. Definite diameters in measurable units are evidently preferable.

8. Many other physical tests than those provided in these specifications are included in existing specifications. The reasons for the omission of some of the more common are given as follows:

Twist Tests.—The wire is sometimes required to permit twisting through a stated number of revolutions before breaking. The results are so easily influenced by temperature, speed of rotation, method of gripping and other variables not easily defined or controlled, that the test is at least of doubtful value. It is the opinion of the committee that it is impractical to so define the conditions of the test that a twist test can be made definite and reliable; hence there is no warrant for its inclusion in specifications.

Wrap Tests.—Wire is sometimes required to permit tight wrapping about a wire of its own diameter, unwrapping and again rewrapping. It is obvious that the making of a test of this kind with wire that is already hard-drawn is exceedingly difficult. Every one who has tried to break off a piece of tough wire by bending it back and forth between the fingers knows how hard it is to confine the bend to one place, because of the hardening action of the previous bends. Hard wire which has been wrapped around a wire of small diameter is hardened still more and it is almost impossible to straighten the wire, let alone recoil it in the opposite direction. In the opinion of the committee it is inadvisable to include a test which at best is so indefinite as a wrap test. Furthermore, it is the opinion of the committee that wire which will meet the physical tests included in the proposed specifications will meet any properly made twist or wrap test that would reasonably be required.

Elastic Limit.—During the tension test on wire there is seldom to be observed any definite drop of the beam or increase in the rate of elongation, corresponding to the yield point commonly observed in testing steel. The only way in which the elastic limit of hard wire may be determined is by the actual plotting of the elastic curve from extensometer readings. Even such tests are difficult of interpretation, because the wire when available for tests is usually curved, due to its having been put up in a coil. There are little sets observable before the true elastic limit has been reached, owing to the fact that one side of the wire, having been stretched in coiling, is really a little harder than the other side, and the pull is, therefore, not even. Considering the difficulty of making the test and the uncertainty of the results obtained, it is the opinion of the committee that it would be inadvisable to include an elastic-limit test in the proposed specifications. It is evident that if the designing engineer requires a knowledge of the location of the elastic limit for purposes of calculation in

designing, such data can be obtained by special tests on representative sizes of wire, which will fix the relation of the elastic limit to the ultimate strength for all wire which is properly made.

Elongation.—Elongation tests on wire are required in different specifications to be measured in lengths varying from 8 to 60 in. The elongation has variously been measured as the permanent increase in the length of the wire, measured between bench marks placed on the wire before fracture; as the elongation measured between the jaws of the testing machine, which are adjusted to grip the wire with a certain definite free length, and in various other ways. Perhaps the most commonly used length is 10 in., and it is a good length, because measurements may be immediately transposed into percentages without laborious calculation. Measurement of elongation in any other way than as the permanent increase in length between bench marks, in the manner customary in the measurement of steel elongation of specimens, is open to criticism. If measurements are made between the jaws of the testing machine there is included a certain amount of elongation which has taken place within the jaws, because the wire in stretching will have been reduced in diameter and, therefore, have stretched to a greater or less extent within the jaws themselves. If the measurement is made between bench marks on the wire just prior to breakage, there is included in the elongation a certain amount of elastic deformation.

9. Electric conductivity is usually expressed as a percentage on the Matthiesen basis, reference being made to determinations of the electrical resistivity of supposedly pure copper by Matthiesen about 1865. Since that time the methods of refining copper have greatly improved, so that to-day it is not uncommon to find copper of over 100 per cent conductivity on the Matthiesen basis. Furthermore, what the electrical engineer requires is that the wire shall not exceed a certain maximum electrical resistance. It seems obvious that it is less laborious to express quantities in direct definite terms rather than by reference to something else which requires interpretation before the results are ready for use in calculation. Resistivity is commonly expressed in a number of different ways, all being equivalent to the resistance of some unit of cross-section, this unit being expressed either in linear dimensions or as a combination of weight and dimensions. For convenience we give a table of equivalents of the values for electrical resistance included in the proposed specifications. The values are equivalent respectively to 97 per cent and 96 per cent conductivity on the Matthiesen basis.

900.77 lb. per mile-ohm is equal to:
0.15776 ohms per meter-gram,
1.7726 microhms per centimeter cube,
0.69789 microhms per inch-cube,
10.663 ohms per mil-foot.
910.15 lb. per mile-ohm is equal to:
0.15941 ohms per meter-gram,
1.7911 microhms per centimeter-cube,
0.70517 microhms per inch-cube,
10.774 ohms per mil-foot.

10. It is obvious that the simplest designation of irregular shapes of similar outline is by sectional area, and the most commonly used unit among electrical engineers is the circular mil. Therefore, while the sizes of grooved trolley wire regularly used are generally known by B & S gage number, corresponding to their sectional area, it has been deemed advisable by the committee to list these sizes, in specifications, by their sectional area expressed in circular mils. The three sizes which are most extensively used commercially are the only ones listed; a fourth size is but little used, and the use is growing less.

11. The only way in which gage variations are easily determinable in irregular shapes is by recourse to weights of standard lengths, and this has been the method adopted in the specifications.

14. So many variations in the construction of cable are possible that it has been deemed inadvisable to complicate the specifications by including requirements for any other than the one type most commonly used.

16. Physical testing of cable is at best a difficult matter, and the measurement of elongation in cable which has been subjected to a tensile test is uncertain, since it includes both the elastic deformation of the cable as a spring,

the actual elongation of the wires, and perhaps even some elastic deformation of the wires as such. It is therefore thought inadvisable to include a requirement covering an elongation test.

17. The permitting of brazes in wire entering into the construction of copper cable was discussed at considerable length, and it is finally the opinion of the committee that, provided no two brazes are closer together than 50 ft., the cable has fully 90 per cent of the theoretical strength obtained by adding together the required strengths of the constituent wires. This is due, in such long lengths, to the frictional gripping of the wires in the cable. The construction of long lengths of cable without brazes is costly, and it has been thought best, therefore, to permit their use, provided they are sufficiently widely spaced as not to be detrimental to the strength of the cable.

CIRCULAR OF MANUFACTURERS' ASSOCIATION ABOUT DENVER

George Keegan, secretary of the Manufacturers' Association, has sent out this week a circular containing a letter addressed to prospective exhibitors by Kenneth D. Hequembourg, vice-president of the exhibit committee, which contains the exhibit arrangements at the Denver convention. The text of the letter follows:

The American Street & Interurban Railway Manufacturers' Association will hold its twenty-eighth annual Railway Appliance Exposition at Denver, Colo., in the new auditorium and adjacent temporary buildings, on Oct. 4 to 8, inclusive. The plans of the exhibit committee were approved by the executive committee on July 7, and your committee is prepared to give details regarding exhibit space and general layout as well as information and regulations of the association.

The auditorium is situated in the central part of Denver, a few blocks from the leading hotels. The Annex buildings are temporarily constructed of heavy canvas, with plank flooring laid over the sidewalk and street, similar to the construction of building No. 3, or annex, on the Steel Pier at Atlantic City. These buildings will be light and contain perhaps the best exhibit space in the whole layout.

The United States Weather Bureau gives us a record of temperature and precipitation for the corresponding period in 1907 and 1908, which bears out Denver's guarantee of good weather in October. A schedule, showing temperature, etc., is given herewith:

WEATHER REPORT, OCTOBER, 1907.

Date.	Temperature, (degrees Fahrenheit)		Precipitations in inches and tenths.	Percentage of sunshine.
	maximum.	minimum.		
1	70	38	0	90
2	67	39	0	37
3	53	38	T.	23
4	67	36	0	87
5	81	39	0	100
6	80	46	.08	78
7	62	45	.04	59
8	73	45	0	77
9	71	42	0	72
10	76	42	0	92

WEATHER REPORT, OCTOBER, 1908.

Date.	Temperature, (degrees Fahrenheit)		Precipitations in inches and tenths.	Percentage of sunshine.
	maximum.	minimum.		
1	79	42	0	86
2	78	56	0	69
3	62	43	.03	60
4	59	41	0	60
5	63	40	0	95
6	64	38	0	75
7	66	36	0	100
8	74	37	0	100
9	77	42	0	78
10	63	42	0	91

The main and only entrance to the exposition will be through the annex, near the registration offices at Fourteenth Street and Curtis Street. Wide aisles lead delegates through the annex and into the center of the auditorium proper on the Champa Street side, through which the delegates will proceed to reach the Convention Hall. The balcony is reached by stairways leading off the main floor of the Convention Hall. It may be found desirable to extend the annex toward Thirteenth Street, thus securing more space on the main floor, in which case the car exhibits would be located at the extreme end of the new part of

the annex, so that spaces 146 to 166 would be available for other exhibits. Heavy weights are permissible in all booths from 1 to 384, inclusive, as shown on the inclosed schedule.

Your committee regrets to advise that it is at this time impossible to give information regarding special freight rates, but that this matter is being attended to and will be taken up in a later bulletin.

In conformance with the ruling of the executive committee all applications for space received on or before July 31 will be considered as having been received on that date, and all such will have equal preference as to location. Applications received after that date will be assigned as they are received chronologically. Applicants may state their preference, giving first, second and third choice. The exhibit committee will do all in their power to satisfy each exhibitor in this intricate proposition in conformity with the conditions and general appearance of the exposition. Any objection made to the ruling of this committee will be received and a hearing may be obtained.

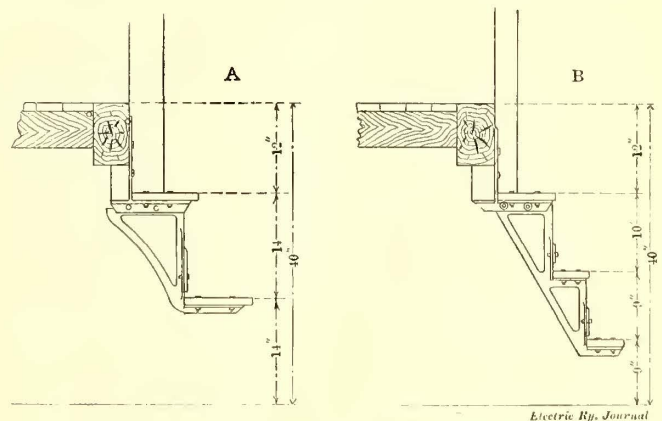
Kindly fill out and mail application blank for space so that the committee can give it their prompt attention, mailing to the nearest of the following: L. M. Cargo, Westinghouse Company, Denver; S. P. McGough, the Lorain Steel Company, Chicago; K. D. Hequembourg, Walker-Bennett Manufacturing Company, New York; George Keegan, New York; whose addresses will be found on the page to the left of the circular, of whom any general inquiries may be made.

If you are not a member write to Charles C. Castle, Hildreth Varnish Company, New York City, who is chairman of the membership committee, or to George Keegan, secretary of the association.

The circular contains information regarding special lighting and electric signs, shipping instructions, weights allowed, freight rates, arrangements for electric power, plan of exhibit space, etc. The exhibit committee is also sending out applications for exhibit space.

STEPS ON OPEN CARS IN TORONTO

An account was published last week of the recent decision of the Toronto Railway & Municipal Board in regard to the height of the steps on open cars in Toronto. The decision calls for two side-steps on open double-truck cars, height from rail level as follows: First, 14 in. to 16 in.; second, 14 in.; third, 12 in. As stated in the article, the Toronto Railway Company, at the request of the board, also tried



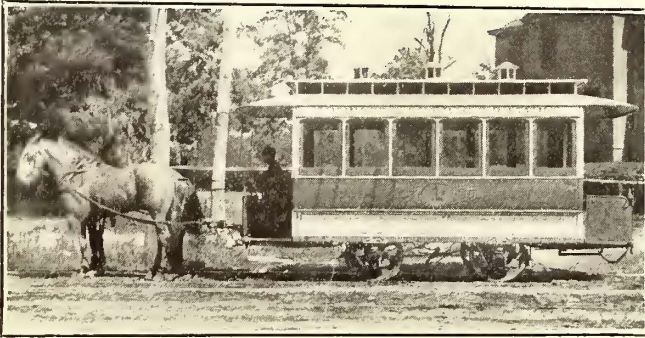
Dimensions of Open Car Steps in Toronto

a system of three steps, but these steps projected so far beyond the side of the car that it was found impossible to operate the cars satisfactorily in the streets.

The two diagrams herewith show the two methods, "A" being that now adopted as standard and "B" being the plan with the extra step. As stated last week, the decision of the board relates to future cars only, and not to the present rolling stock.

BALTIMORE COMPANY CELEBRATES ITS FIFTIETH ANNIVERSARY

On July 26 the United Railways & Electric Company, Baltimore, Md., celebrated the fiftieth anniversary of the establishment of street railway service in Baltimore. The first line in Baltimore was about 2 miles long. It extended from the foot of Broadway to North Street, and over it for some time was operated a lone horse car in entire charge of a driver. From this beginning the system has



First Horse Car in Baltimore

grown until to-day the lines of the United Railways & Electric Company, which controls all the city lines proper, comprising more than 400 miles of track, over which 750 cars are operated by an army of employes directly and indirectly connected with the actual work of running a car, and numbering 4500 men and women.

To make the anniversary especially significant to its employees, the company planned a special celebration for them, and gave the employees and their families an outing at Bay Shore Park and Gwynn Oak Park on Monday. Tickets entitling the holders to free transportation to the park were distributed by the management, besides which coupons were given the families of the employes, entitling them to all the privileges of the grounds, including the attractions. As a mark of identification, the company also gave each employe a small silk pennant bearing the words "1859—United Railways—1909." The employees were apprised of the celebration planned in their behalf by the fol-



First Electric Car in Baltimore

lowing letter, addressed to them by William A. House, president of the company:

Monday, July 26, marks the fiftieth anniversary of the inauguration of street-car service in this city.

On July 26, 1859, a small car was placed in operation from the foot of Broadway to Baltimore and North Streets. It was regarded as a great curiosity, an innovation, and the wisacres of that day were sure it could never displace the slow and lumbering omnibus. However, to-day this primitive horse-car line has grown into a system operating about 400 miles of track, with a generating capacity of nearly 50,000 hp and employing 4500 persons.

Our railway system may be likened to a huge industrial machine—a harmoniously adjusted unit—of which each individual employee forms a component part and has a certain function to perform.

This growth, success and superior service are due largely to the loyalty, efficiency and harmonious team work of the company's employees.

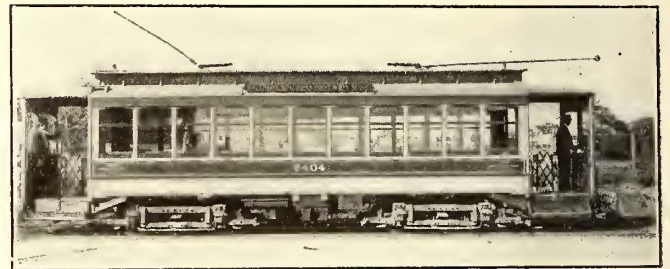
In appreciation of this fact it has occurred that it might be a fitting celebration of the fiftieth anniversary for the company to extend to its employees and their families an invitation to use Gwynn Oak and Bay Shore Parks on that day for a general company outing and picnic.

On behalf of the company, therefore, a cordial invitation is extended to you and your families for a day's outing at either Gwynn Oak or Bay Shore on Monday, July 26, and to enjoy the attractions of those resorts.

To discharge our obligation to the traveling public, you realize, of course, that there can be no interruption in the operations of the system on that day, and that while some of you will be unable, personally, to take advantage of this invitation, except possibly for a few hours, it is hoped that your families will find it convenient to enjoy these attractions as the company's guests.

It is the earnest wish of the company that the day may prove to be one of unalloyed pleasure to you and yours, and that the fiftieth milestone in our progress may be a banner day in the history of our company.

On Monday the offices and buildings of the company were decorated, and each car carried a number of flags and a pennant descriptive of the occasion. Both Mr. House and his wife, and T. A. Cross, general manager of the company,



Modern Electric Car Used in Baltimore

and his wife visited the different parks during the day. Schedules were so adjusted that all trainmen were given an opportunity to attend the festivities at one or the other of the two parks during the day, and both parks were crowded to their capacity.

Through the courtesy of Mr. House the ELECTRIC RAILWAY JOURNAL is able to present the following review of railway progress in Baltimore from the day the first street car was placed in operation, on July 12, 1859, as an experiment:

The car which had been operated as an experiment on July 12 was placed in operation to carry passengers on July 26, 1859. On Aug. 24, 1859, the City Passenger Railway began operating a road, which subsequently became the Green & Pennsylvania line. These cars started from Baltimore Street and Sharp Street and ran up Pennsylvania Avenue to the Boundary. On Sept. 12, 1859, cars were placed in operation on the line extending out Baltimore Street to Franklin Square. On Nov. 18, 1859, the White Line of the City Passenger Railway was extended out Madison Street to Boundry Avenue. On Dec. 11, 1861, the Red Line was diverted from Baltimore Street east to Gay and carried out Gay Street to the Blue Line (the present St. Paul Street service), and put into operation as far north as Boundry Avenue on Dec. 4, 1862. In the early 80's the City Passenger Railway assumed control of the Harford Avenue and the Orleans Street line, and in 1888 it gained control of the Central Line.

The Citizens' Passenger Railway and the Catonsville & Ellicott Mills Railway entered the field at an early date in competition with the City Passenger Railway. The Towson Railroad, incorporated on March 9, 1858, completed its line to Govanstown on May 27, 1863, and shortly thereafter reached Towson. On June 25, 1868, the Citizens' Passenger Railway obtained a grant to build from Druid Hill Park to Patterson Park. In 1872 the City Council passed an ordinance granting the Park Railway the privilege of building a line from German Street and South Street to the northern city limits. This franchise was acquired by the Baltimore, Peabody Heights & Waverly Passenger Railway, incorporated in 1872, and in 1874 this company purchased the Peabody Heights Railway. In 1870 the Baltimore & Hall Springs Passenger Railway constructed a line from the City Hall to Harford, where connections were made with the line for Homestead and Hall Springs. The People's Passenger Railway was incorporated in 1876. It built a line from Druid Hill and Boundary Avenue to Port McHenry, and the first car was run on Aug. 9, 1879. The Baltimore, Calverton & Powhatan Railway was incorporated in 1870 to build a line to Baltimore, Wetheredsville, Franklinton and Powhatan. Up to 1880 there were the City Passenger, operating about six lines; the Citizens' Passenger Railway, operating a Druid Hill Park-Patterson Park service; the People's Passenger Railway, covering the city from Druid Hill Avenue and the boundary to Fort McHenry; the Baltimore, Peabody Heights & Waverly Passenger Railway from South and German Street via Bolton Street to Waverly; the York Road to Towson; the Catonsville, and lines to Powhatan and Hall Springs.

In 1870 the Citizens' Passenger Railway attempted to substitute steam for horses as a motive power, and placed in operation on Sept. 28, 1876, a queer-looking steam-dummy train, but the experiment was discontinued after 60 days. The next step in rapid transit in Baltimore was the use of the Daft system on the Baltimore Union Passenger Railway in 1885. This line ran from the outskirts of the city to the village of Hampton, a distance of about 2 miles. Two locomotives were built for this service, and one of the trains is shown in the accompanying illustration. Service was opened on this line on Aug. 10, 1885, but the experiment was discontinued after a short trial. Six years after the opening of the Baltimore Union Passenger Railway, the Baltimore Traction Company opened a cable line on Druid Hill Avenue. This service was started on May 23, 1891, and continued for five years. The road was then electrified. From 1891 to Oct. 4, 1893, 20 rapid transit lines were opened in Baltimore. Cable was still favored as motor power in Baltimore as late as 1893, for on Aug. 20 of that year the City Passenger Railway opened its Madison Avenue cable line. This afterward proved to be the last cable line in Baltimore. The period of reconstruction and conversion of the railways in Baltimore from cable and horse-power to electricity extended from 1895 to 1899. During this time there developed among the companies a tendency toward consolidation, and in June, 1897, the Baltimore Consolidated Railway was formed, and subsequently effected the consolidation of a number of lines. A little earlier than this, however, the Baltimore Traction Company absorbed the Citizens' Passenger Railway, the People's Railway, the North Baltimore Railway, the Pimlico & Pikesville Railway and a number of other lines. The Baltimore Traction Company and the City & Interurban Railway, the Lake Roland Elevated were subsequently consolidated as the Baltimore Consolidated Railway, which ac-

quired the Ellicott City branch of the Columbia & Maryland Electric Railway by purchase in 1898. Finally, on March 4, 1899, the United Railways & Electric Company took over all the street railways in Baltimore.

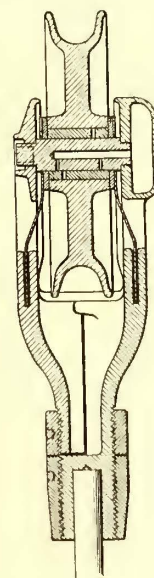
A summary of the notable events in the history of street railroading in Baltimore follows:

Plans for first horse-car line formed.....	1854
City authorized laying of tracks.....	March 28, 1859
First car ran from foot of Broadway to	
Baltimore and North Streets.....	July 26, 1859
Second (Green) line opened.....	Aug. 24, 1859
Red line opened on Baltimore Street.....	Sept. 12, 1859
First all-night cars (ran one week only)....	Dec. 17, 1860
Catonsville line opened.....	July 23, 1862
Blue line opened to North Avenue.....	Dec. 4, 1862
Govanstown line opened.....	May 27, 1863
First Sunday cars operated.....	April 28, 1867
Line connecting Druid Hill and Patterson	
parks opened	June 25, 1868
Hall's Spring and Powhatan lines opened.....	1870
First "Jim-Crow" cars	May 2, 1870
"Jim-Crow" cars abandoned	Nov. 11, 1871
First rapid transit (steam cars).....	Sept. 28, 1876
Fort McHenry line opened.....	Aug. 9, 1879
First electric cars (at Hampden).....	Aug. 10, 1885
First cable cars (Druid Hill Avenue).....	May 23, 1891
Baltimore Consolidated Railway formed.....	June, 1897
All of the lines consolidated in the United	
Railways & Electric Company.....	March 4, 1899

One of the most pleasing features of the celebration to the company was the spirit with which the newspapers entered into the plans of the company to make the affair a success. All the papers told about the celebration, and on Sunday, July 25, the *Baltimore Sun*, *Baltimore News* and *Baltimore American* published in their magazine sections long descriptive articles reviewing the history of the company, illuminated them with striking photographs showing the contrasts between the facilities afforded for transportation in Baltimore now and a few years ago.

A SELF-LUBRICATING HARP AND TROLLEY WHEEL

The Pacific Electric Railway Company, Los Angeles, Cal., has recently installed a number of self-lubricating trolley harps and wheels devised by Joseph M. Smith,



Self-Lubricating Trolley Wheel

Worcester, Mass. As shown in the accompanying section, one side of the harp is fitted with a head for an oil well. When this chamber is filled, the oil enters the passage in the journal pin, and after going through ducts in the pin, passes through perforations in the bushing in the bore of the trolley wheel. In this way the trolley wheel is constantly lubricated as long as it is kept in motion.

The trolley wheel washers are held in place by spring plates. The latter fit into vertical recesses at the bottom of the harp, but are readily removable. The springs extend to the interior of the harp through transverse openings, as shown. It will be noted that the harp members are detachably connected by cutting one side with a rectangular seat, the other member being shaped to correspond. Both pieces are tapered at the lower end to receive the nut which fastens them to the trolley pole. This type of harp and wheel is being

made and sold by the Worcester Railway Supply Company, Worcester, Mass.

A NEW CAR CURTAIN FIXTURE

The accompanying engravings illustrate the mechanism of a new and improved form of curtain fixture for steam and electric railway cars which is made by the Planet Company, Chicago, Ill. The construction is simple and durable, consisting of a brass tube, one small spring, one operating lever made of brass, two brass heads, two round steel rods, to which small steel clips are fastened, and a brass cover plate, part of which forms the pinch handle. This construction employs no small wheels, cams or rings. The fixture is free from dust pockets and cannot accumulate dust or dirt, which makes it sanitary and easy to keep clean.

Fig. 1 is a sectional view of the fixture with cover plate of handle removed. It shows the position of the operating lever, the spring and the round rods when assembled. Passing through the inside of the lever is a square hole and riveted to the spring are two small washers with

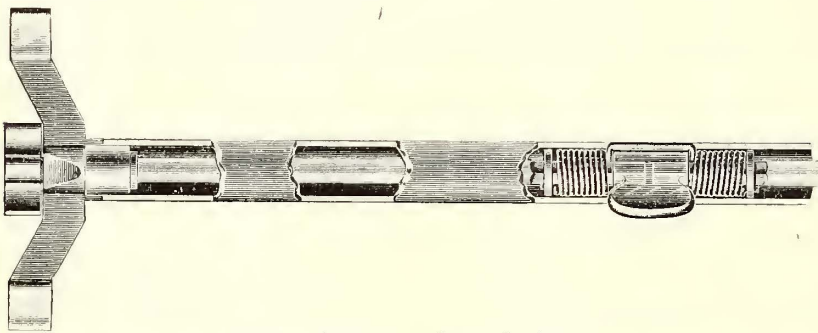


Fig. 1—Sectional View of Fixture

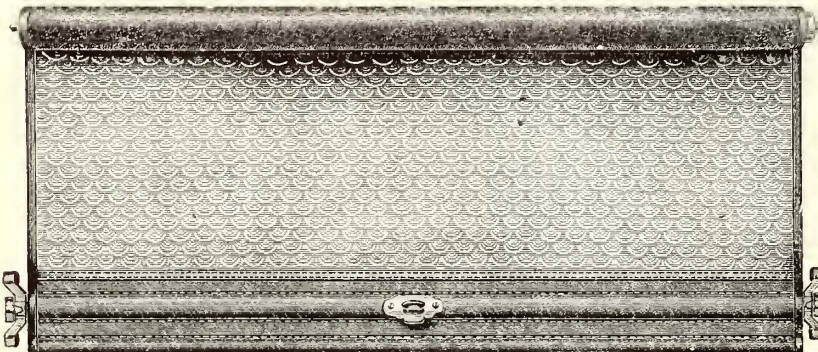


Fig. 4—Fixture Attached to Curtain

square holes in them. One end of the rods is squared, and as shown in the illustration these rods pass through the washers, through the torsion spring and into the square hole in the operating lever, the ends of the rods almost meeting in the center of the lever. The square hole in the lever being a trifle larger than the square ends of the rods gives each rod enough independent action to insure gripping in both grooves should they vary any in width. The tube is slotted in both ends and the guide heads are fastened to the rods so as they can be pushed in or drawn out three-quarters of an inch for adjustment should the distance between the top and bottom of the grooves vary. The assembling of the fixture is a simple operation and the curtains can be attached easily.

Fig. 2 is a view of the end of the fixture in holding position. The principle of locking is simple and effective, the grip of friction being on the sides of the grooves instead of an outward pressure against the posts. On each end of the fixture there is a small S-shaped casting which with the guide gives four points of contact in each groove,

locking the fixture so securely that it cannot creep. It is immaterial whether the grooves be rough or smooth, varnished or unvarnished. The fixture requires the same size grooves as all other fixtures, $\frac{3}{8}$ in. wide by $\frac{3}{8}$ in. to $\frac{1}{2}$ in. deep. The clips and guide heads are shaped so that they will not wear, scratch or cut the grooves. This locking arrangement will work well in steel cars where brass slots or grooves are used and fastened on with screws driven in through the bottom of the groove into the post. There is nothing to rattle and the end of the fixture cannot catch on the screw slots, as there is $\frac{1}{8}$ -in. clearance. The pinch handle is in the opposite position from other styles and places the operating lever in a more convenient position for passengers to grasp. It is not necessary to pinch in and then push up or pull down. To release the tension all that is necessary is to take hold of the pinch handle, give it the slightest pressure and it is free to run up or be drawn down. Fig. 3 is a view of the non-holding position of the fixture.



Fig. 2—Holding Position

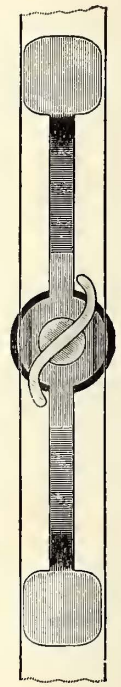


Fig. 3—Non-Holding Position

Fig. 4 shows the fixture attached to a curtain. Only a slight portion of the guide heads can be seen when placed in the window frame. As the heads do not move in or out in operation the curtains can be made full width to entirely shut out the light. This feature, together with the fact that the curtain cannot creep, makes this fixture very desirable for sleeping cars.

The few parts and the minimum amount of workmanship required in its manufacture make the fixture quite inexpensive as compared with other fixtures. The parts are made of solid metal to render the device durable and are constructed to withstand the roughest kind of usage. The spring is made of music wire and it is claimed will wear indefinitely. The tension is controlled by one lever and one spring insures the releasing of both sides at the same instant, allowing the curtains to roll and unroll evenly at all times. This eliminates crooked or furrowed curtains.

The Planet Company has named this device the Eclipse curtain fixture.

News of Electric Railways

Cleveland Traction Situation

Warren Bicknell, receiver of the Municipal Traction Company, has presented a tabulation of the earnings of the company which shows that the operation of the system at a 3-cent fare would have resulted in a deficit for the seven months the property has been under his charge. The results which would have followed the operation of the system at a 3-cent fare, as arrived at by Mr. Bicknell, are shown in the accompanying table:

	December, 1908.	January, 1909.	February, 1909.	March, 1909.	April, 1909.	May, 1909.	June, 1909.
Number passengers carried.....	12,301,335	11,673,783	10,189,222	11,454,473	11,435,401	12,132,689	12,443,186
Pay passengers, at 3 cents.....	\$369,040	\$350,213	\$305,677	\$343,634	\$343,062	\$363,980	\$373,305
Other earnings (actual):							
Chartered cars.....	674	726	743	1,008	1,038	1,414	2,261
Touring cars.....	.....	.....	.....	.....	.....	86	540
Freight and express.....	2,792	2,095	2,095	2,372	3,357	4,377	3,640
Mail.....	1,003	1,405	1,158	1,155	1,156	1,156	1,157
Passes.....	.....	.....	.....	.....	.....	2,184	3,542
Newspapers.....	1,333	1,133	1,333	1,333	1,333	1,333	1,333
Advertising.....	3,794	3,682	4,025	3,729	3,313	3,254	3,277
Rent of land and buildings.....	14	33	38	33	33	33	33
Rent of tracks.....	20	20	20	20	20	20	20
Miscellaneous.....	2,352	2,096	3,211	2,874	3,062	2,789	3,532
Total earnings.....	\$380,992	\$361,603	\$318,294	\$356,158	\$356,374	\$380,456	\$392,589
Expenses:							
Maintenance (as provided in lease).....	\$99,580	\$98,429	\$88,668	\$98,174	\$96,010	\$106,257	\$107,330
Operating (actual).....	180,270	179,548	164,485	176,386	169,903	175,972	174,257
General (actual).....	39,211	34,109	34,895	34,469	37,808	37,250	38,070
Taxes (actual).....	23,544	22,847	23,504	24,103	24,114	24,401	24,644
Interest, bond (actual).....	40,293	38,552	39,516	39,516	38,803	38,589	38,580
Neutral Street Railway rental (actual).....	891	1,008	937	936	937	937	936
Total expenses.....	\$383,790	\$374,493	\$352,065	\$373,584	\$367,655	\$383,496	\$384,227
Deficit (exclusive interest on capital investment).....	\$2,798	\$12,389	\$33,770	\$17,426	\$11,290	\$3,039	*\$7,862
Interest on capital investment.....	73,378	73,378	73,378	73,378	73,378	73,378	73,378
Deficit with interest charged.....	\$76,176	\$86,267	\$107,148	\$90,804	\$84,668	\$76,417	\$65,515
Transfer passengers:							
Number carried on transfers.....	3,846,250	3,859,273	3,224,535	3,682,078	3,741,649	4,265,749	4,317,991
Revenue derived if charged 1 cent—no refund.....	\$38,462	\$38,592	\$32,245	\$36,820	\$37,416	\$42,657	\$43,179
Deficit, with 1 cent transfer—no refund.....	\$37,713	\$47,675	\$74,903	\$53,983	\$47,252	\$33,760	\$22,336
Total deficit, exclusive of interest on capital, for seven months.....							\$73,353
Total deficit for seven months.....							\$586,999
Total deficit if 1 cent for transfer were charged, with no refund, for seven months.....							\$317,624

* Surplus.

These figures cover the operation of the entire system, both in the city and the suburbs. Every month, with one exception, shows a deficit, exclusive of the interest charges. With interest added, the deficit increases for the seven months to \$586,999. The deficit, with a charge of 1 cent for transfer, not rebated, would have amounted to \$317,624. These figures show that the system can not be operated at a 3-cent fare with 1 cent for transfers and pay the operating expenses, fixed charges and dividends on the stock. The average fare received from the 3-cent lines, with the charge for transfers, brings the receipts up, so that they yield more than the flat rate used in the tabulation. The average is 3.62 cents, while the average rate from all lines for June, 1909, was 4.37 cents.

Mayor Johnson says it is proposed to charge 3 cents only within the city limits. He charges that a surplus of almost \$1,000,000 has been accumulated by the receivers and that a portion of this has been set aside to defray claims for accidents that are not properly a charge, and for repairs which are still to be made. Mr. Bicknell states that \$800,000 has been deposited in the local banks to be used in paying claims against the Municipal Traction Company and for other necessary purposes, but that all of this money could be used to advantage within a short time for rehabilitation work.

Robert E. McKisson, a former Mayor of Cleveland, has entered the referendum campaign of his own accord and independently of the committee of 100. He is urging the defeat of the Schmidt grant. Mr. McKisson favors a low fare during the morning and evening rush hours, with a higher rate for the remainder of the day. He argues with many others that the conditions imposed by the extension ordinances granted to Mr. Schmidt are not applicable to the original franchises and that the Mayor and the administration speakers are making promises which they know it will be impossible to fulfill under the terms of the new grants. It is probable that Mr. McKisson will be a candidate for mayor before the Republican city convention. He says, however, that he is taking an active part in the campaign because he feels that the administration plan should be defeated.

After several conferences of the representatives of organized labor a circular has been prepared, denouncing the

Schmidt franchise and advising members of the various unions to vote and work against it.

At one of the tent meetings, John A. Cline, prosecuting attorney, asserted that under the extension ordinance prepared for Herman Schmidt the right is given to charge any fare the owners of the franchise see fit to exact, but that the clause making this possible is so drawn as to eliminate suspicion.

Mayor Johnson has had small billboards erected at all points of vantage in and about the Public Square on which

he has placed a poster containing his latest argument that the people will do away with all opportunity for competition if the Schmidt franchise is defeated. The first posters put on the billboards stated that the question was between 3-cent and 5-cent fares and that a vote for the Schmidt grant will be a vote for 3-cent fare. While the Taylor plan does provide for an initial fare of 5 cents it contains the new principle of a sliding fare, depending upon the ability of the company to give good service and pay 6 per cent on the investment.

Proposed Franchise for Des Moines

The City Council of Des Moines, Ia., on May 24, 1909, passed a resolution authorizing the corporation counsel to prepare and submit to the City Council a new ordinance to govern the relations between the city of Des Moines and the Des Moines City Railway. Previous to the passage of this resolution the question had arisen of the authority of the Des Moines City Railway under the franchise which it now holds, and it was decided by the city that an expedient way to settle the differences between the city and the company would be to draw a new ordinance as a basis for negotiations for a new agreement between the company and the city. The city and the company seem to be particularly at odds regarding the right of the company to operate interurban cars over its tracks and the rights of the Interurban Railway Company. In preparing the ordinance, William H. Baily, corporation counsel of Des Moines, followed the ordinance governing the right of the Chicago City Railway to operate in Chicago. The report of the corporation counsel on the proposed ordinance reviews the resolution authorizing the new grant and the conditions which led the Council to decide to have a new ordinance drawn. It also contains statements by the company showing its financial condition and earning capacity, on which are based some of the provisions of the ordinance. The ordinance provides in brief as follows:

The franchise of the Des Moines City Railway is to be extended for a period of 25 years from April 1, 1910. The company may permit other street and interurban railways to use its tracks, subject to regulations imposed by the

City Council. The compensation for the use of such city lines by the interurban railway is to be fixed by mutual agreement between the companies, if possible. In the event of their failure to agree to terms, the same are to be fixed by a board of three arbitrators, who shall be members of the railroad commission. If the members of the railroad commission, for any reason, refuse to act, however, one arbitrator is to be selected by the city company, one by the interurban railway seeking entrance to the city and the third by the City Council. Pending such arbitration, however, the interurban railway is to have the right to use the tracks designated by the City Council, provided the company execute a bond adequate to cover any loss that may be sustained by the city company. Failure by the interurban railway to pay its rental forfeits its right to operate in the city. In case of any controversy as to the compensation, the fixing of the amount due is to be submitted to arbitration as previously mentioned. Interurban cars operating in the city over the Des Moines City Railway are to be subject to the conditions governing the operation of that company's cars. The company is given the right to haul freight, subject to conditions to be imposed by the City Council. It is to proceed at once to reconstruct portions of its track and roadbed, and otherwise improve its property in compliance with specifications provided for such work as set forth in detail in the ordinance.

In laying or relaying rails in streets, the distance between center lines of track is not to be less than 9 ft. 8½ in. The exact location of tracks in the streets is to be subject to the approval of the superintendent of the department of street and public improvements. The new track is to be laid with girder rail weighing not less than 129 lb. per yd., which must conform to specifications for grooved rail made by the city engineer and approved by the City Council. The company is to grade, pave, keep in repair, sweep, sprinkle and clean free from snow 8 ft. of all streets and public ways occupied by it with a single-track line and 16 ft. with a double-track line. All cars hereafter put into service are to be equipped with double trucks and seat 40 or 50 passengers, and nine months after the approval of the ordinance by the voters every passenger car is to be equipped with hand brakes and power brakes of a type approved by the board of supervising engineers.

Nine months after the approval of the ordinance by the voters every passenger car is to be vestibuled. The city is to have the right, subject to certain limitations, to require the company to make such extensions as it may deem necessary. All work of rehabilitation is to be carried out subject to the approval of the board of supervising engineers, which is to consist of an engineer to represent the city, an engineer to represent the company and an engineer selected by the representatives of the city and the company. The engineer selected by the city and the company is to be ex-officio chairman of the board, and during the period of immediate rehabilitation is to act as chief engineer of the work contemplated in the ordinance. He is to be paid at a rate to be agreed upon by the city and the company, and he is to receive such additional compensation for his services during the period of rehabilitation as the city and the company may deem commensurate with the work involved. Each of the other two members of the board is to be paid for his services at the rate of \$100 a day and his traveling and living expenses while away from home, it being understood that his total compensation for service shall not be less than \$2,500 nor more than \$5,000 per year. The salaries and expenses of the board of supervising engineers during the period of rehabilitation are to be added to the cost of such rehabilitation, and thereafter are to be paid out of the gross receipts of the company as operating expenses.

The rate of cash fare is to be 5 cents for each passenger 12 years of age or over and 3 cents for each passenger under 12 years of age. Children under 7 years of age, accompanied by their parents or a guardian, are to ride free. The company is to sell six tickets, through its conductors, for 25 cents. Transfers are to be good upon any line of the Des Moines City Railway other than the one on which they are issued or on any other street railway or interurban railway operated in Des Moines. Transfers are to be accepted for passage where lines cross or come within the distance of 200 ft. of the line on which the passenger has taken passage. A transfer is to be issued on a transfer, but passengers who transfer are to be required to travel in the same general direction. No passes are to be issued except to employees of the company, policemen, firemen, or officers of the health department of Des Moines in full uniform or wearing their official badges. The company is to be permitted to set aside as a separate fund to defray personal injury claims such percentage of its gross receipts as the board of supervising engineers

deem sufficient to protect the company against all such claims. This provision will also protect the city, should it exercise its option to purchase the property at the expiration of the franchise grant.

Immediately upon the acceptance of the ordinance by the company a commission is to be appointed to appraise the property. The company is to appoint a commissioner as a member of the appraisal commission, the city is to appoint a commissioner to represent it, and the third member is to be selected by the city and the company. Within 25 days after accepting the ordinance, the company is to file with the Superintendent of the Department of Accounts and Finances of the city an inventory of all its holdings. The city reserves to itself the right upon April 1 or Oct. 1 of each year after the acceptance of the ordinance to purchase the property upon six months' notice at the appraised value and a sum equal to the cost of improvements made after the appraisal. If the city does not exercise its right to purchase the property during the expiration of the franchise grant, it is to have the right to designate parties who may purchase the property after the expiration of the grant at the figure at which the city could take over the property. Of the net receipts of the company, 45 per cent are to be retained by the company and 55 per cent are to be paid to the city. The city reserves the right to use a sum not exceeding its share of the net receipts of the company for the previous year to reduce the rate of fare. In the event of such a reduction, the company is to deduct and retain as its share of the net receipts each year an amount equal to what would have been its share of the net receipts had the passengers carried during the year paid the fare originally prescribed in the ordinance. Subject to the action of the City Council, the city is to deposit its share of the net receipts to create a fund to be reserved to purchase the railway system at the expiration of the franchise.

More Transit Talks in Philadelphia

The Philadelphia (Pa.) Rapid Transit Company has published No. 3 and No. 4 of its transit talks, entitled respectively, "Transfers" and "When Seventh Street Was 'Out of Town'—and Since." Talk No. 3 was dated July 20, 1909. It follows:

Unlimited transfers will bankrupt any traction company.

It costs as much to carry a transfer passenger as it costs to carry a passenger for the cash portion of his trip—sometimes more.

Overextension of the transfer privilege was directly responsible for the bankruptcy of one of the most important systems in New York City, where the giving of unlimited transfers reduced the revenue per passenger to a fraction over 3 cents. The Philadelphia Rapid Transit Company's revenue was in the same way reduced almost as low a few years ago.

In the end the public at large does not benefit by cutting down the revenue of public service corporations to a point below which good service can be given.

Last year we issued 83,448,925 transfers, nearly 7,000,000 a month. That is to say, every month the company carried 7,000,000 people part, and perhaps the larger part, of a trolley trip without charge. The company gives transfers in 382 directions from 175 points. Hardly any city in the country has more liberal transfer facilities.

Nothing short of a universal transfer system would satisfy everybody.

We make transfer arrangements which are aimed to meet the requirements of the general trend of travel, but there are still complainants who find that they cannot go from one point to another for one fare. There are doubtless a large number of such cases, but it does not follow that the transfer rights given are unduly restricted.

It seems reasonable to ask that the transfer problem be considered as a part of our problem as a whole, which is to get a revenue that will pay for the cost of transportation. It is not the individual problem of particular riders or sections.

When considered in this way it will be found that the Philadelphia Rapid Transit Company gives as many transfers, over as wide a territory, and accommodates as many people by these transfers, as does any transportation company in a large city.

Talk No. 4 was dated July 24, 1909. It follows:

Watson in his delightful "Annals" records an incident that reveals how far we have progressed since his book was written.

He tells of a prosperous Second Street storekeeper about the beginning of the last century, when every tradesman lived over his shop, who erected a dwelling house at Seventh Street and Spruce Street. The house was much admired, but everybody predicted that the man would fail in business because it was believed that no one could succeed who lived so far from his work!

How enormous has been the growth of Philadelphia since Seventh Street was regarded as "out of town"!

In those days we grew house by house; now it is square by square. What would be the amazement of Watson could he behold the man or woman who daily travels 15 miles to and from his or her place of employment!

The city of Philadelphia increases at the rate of between 6000 or 7000 dwellings every year. That means more than 21 miles of houses, if placed side by side.

Since Watson's day 1000 miles of paved streets have been constructed, and 335,000 buildings of all descriptions! And Philadelphia is still growing!

What power since the old annalist's time has been added to the world's forces to make such marvelous growth possible? *Electricity*, tamed and harnessed into man's most useful servant.

This force, converting the old-time street cars, drawn by horses, into the 160-hp trolley car of to-day, has worked the transformation of the city.

Under the management of the Philadelphia Rapid Transit Company more than 500 miles of electric lines now link together every portion of

Philadelphia in close relationship and bring the suburbs into speedy touch with the city's business heart.

This is only what traction companies should do. But their part in the development of the modern city is rarely acknowledged, and their rewards are scant in comparison to the vast additions they make to the city's wealth and wellbeing.

Ohio Electric Railway Moves Several Departments to Springfield.—Because Springfield, Ohio, is almost the geographical center of the system, the auditor, the general passenger agent and the general freight agent of the Ohio Electric Railway will move from the Traction Building in Cincinnati to Springfield on Aug. 1, 1909. The auditor of receipts moved to Springfield in January, 1909.

Car License Suit Decided Against North Jersey Street Railway.—Justice Swayze in the Supreme Court at Trenton, N. J., on July 20, 1909, in the suit brought by Jersey City against the North Jersey Street Railway, now merged in the Public Service Railway, held that the company is liable for unpaid license fees since 1867 of \$10 for each car operated within the city. The amount of the obligation will be fixed by the Court if counsel cannot agree thereon. An appeal will be taken to the Court of Errors and Appeals.

Consideration of Tunnel Franchise at Camden Postponed.—The City Council of Camden, N. J., met on July 22 to consider the terms of the proposed franchise grant to the Camden Tunnel Railway, which proposes to build a tunnel between Camden and Philadelphia. The company conferred recently with E. G. C. Bleakley, counsel of Camden, regarding a proposed ordinance, and terms were agreed to subject to the approval of the Council, as announced in the *ELECTRIC RAILWAY JOURNAL* of July 10, 1909, page 88. Only eight members of the Council were present on July 22, and action on the franchise was deferred until Sept. 8, 1909. W. A. Stern, of Stern & Silverman, Philadelphia, who is interested in the company, is quoted as stating that the consent of the Council of Camden to the construction of the line is not necessarily essential on account of a special enabling act for tunnels passed by the Legislature.

Proposal for a New Franchise in Norwood, Ohio.—Upon the request of the Village Council of Norwood, Ohio, that the Cincinnati (Ohio) Traction Company lay new heavy rails on Montgomery Road when that thoroughfare is improved by the village and the county jointly, W. Kesley Schoepf, president of the company, stated that the franchise of the company has only five years to run and that the rails in use are good for a longer period than that, but that if the Council will extend the franchise to 25 years the company will lay 90-lb. T-rail in a 6-in. concrete bed and extend the line so as to serve the west end of the village. The proposal means an expenditure of more than \$80,000.

City Rules Submitted for Comment.—The American Street & Interurban Railway Transportation & Traffic Association has sent to the general managers of member and non-member companies tentative changes in the form and arrangement of city rules, agreed upon by the city rules committee of the association which the association desires managers to study carefully and send the committee their suggestions and criticisms, or come to the Denver convention during the week of Oct. 4 prepared to discuss the rules as they have been drafted. Suggestions and criticisms should be addressed to B. V. Swenson, secretary of the association, 29 West Thirty-ninth Street, New York, N. Y.

Plan for a Report on Subways in Pittsburgh.—In the *ELECTRIC RAILWAY JOURNAL* of July 24, 1909, page 155, mention was made of a plan of the sub-committee on subways of the City Council of Pittsburgh to secure a report on subways in that city. W. A. Magee, Mayor of Pittsburgh, in reply to an inquiry regarding the matter, said: "The expert which we intend to employ for the subway has not yet been selected and it has not been determined what the nature of the work shall be; that is to say, whether he will examine the whole subject and make a formal report, or whether he will merely be employed to sit with the committee and informally advise it as it proceeds with its work on the ordinances now pending before it."

Properties in Ohio Inspected.—Thomas D. Cuyler, a director of the Pennsylvania Railroad, and at one time a large stockholder in the International Traction Company, Buffalo; J. J. Turner, second vice-president of the Pennsylvania Lines West of Pittsburgh; A. M. Shoyer, general superintendent of the Pennsylvania Lines West of Pittsburgh; Arthur Newbold, representing the Drexel interests of Philadelphia; W. L. Lloyd, president of the Commercial Trust Company, Philadelphia; Thomas Hamilton, superintendent of the Cleveland & Pittsburgh division of the Pennsylvania Railroad, and W. Caryl Ely, Buffalo, were members of a party that inspected the property of the East Liverpool Traction & Light Company, East Liverpool, Ohio, on July 19.

Suit to Restore Strip Tickets in Philadelphia Dismissed.—Common Pleas Court No. 2 at Philadelphia has dismissed the bills filed by Rudolph Blankenburg, representing the committee of 15 and the city, requesting injunctions to compel the Philadelphia (Pa.) Rapid Transit Company to restore the sale of the strip tickets at the rate of six for 25 cents. The judges decided that, there being no duty on the part of the company to sell the tickets, the discontinuance of their sale was a mere change in a detail of management and did not require the consent of Councils under the company's contract with the city. Judge Wiltbank, the third member of the court, concurred with his associates, but filed a dissenting decision in the city's action, expressing the view that the interpretation of "rates of fare" in the company's contract with the city meant 5 cents, 8 cents and six-for-a-quarter tickets, the fares at the time the contract was signed. Judges Sulzberger and Barratt in their decision in the city's suit followed the recent ruling of the Supreme Court in dismissing the suit brought directly in that tribunal by City Solicitor Gendell. They held that the only rate of fare contemplated by the agreement was the straight 5 cents for a single ride and that the withdrawal of the strip tickets was not a change in violation of the contract. In the Blankenburg case it was decided that the plaintiff, as an individual, had no standing in view of the city asserting a similar claim.

Kansas City Ordinance Recommended for Passage.—Eight of the 10 members of the West Twelfth Street traffic way commission of Kansas City, Mo., which has under consideration a new franchise to govern the relations between the Metropolitan Street Railway and the city, have signed the modified ordinance mentioned in the *ELECTRIC RAILWAY JOURNAL* of July 17, 1909, page 120, and recommended its passage to the City Council. Mayor Crittenden in presenting the ordinance outlined the conditions that led the committee to consider the matter and recommend a proposed ordinance. The Mayor said that he visited Chicago personally many months ago to study street railway conditions there and in particular the terms under which the Chicago City Railway and the Chicago Railways operate and the effect of the operating agreement on the service rendered. He afterward communicated with the traffic way commission regarding the matter, and as a result a delegation from that body went to Chicago to study transit conditions there. The Mayor said his governing idea is to supplant the present grants of the Metropolitan Street Railway with a blanket franchise that will conserve the interests of the company and the city and remove clauses admitting of various dubious interpretations and which are a menace to the city and the company. A long statement reviewing the conditions of the grant accompanied the ordinance as part of the full report of the commission to the Council.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

Connecticut.—Representatives Chandler and Whiton, of the special committee of the Senate and House which has been considering public utility matters, have presented a minority report and urge the adoption of a measure which generally is considered more radical than the one which was adversely reported by the judiciary committee earlier in the session. The minority bill provides for a commission of five members with salaries of \$4,000 each, and abolishes the Railroad Commission, vesting the powers of that body with the new commission. Members of the commission are to be nominated by the Governor and appointed by the General Assembly, and one member must be a lawyer and another a capable and experienced civil engineer. The bill further requires gas, electric, water and electric railway companies to report to the State; provides for the supervision of issues of stocks and bonds by public service corporations; for the supervision of service and rates of these companies and invests the commission with the power to order repairs. Conditions in the Assembly regarding public utilities legislation are peculiar, and it is regarded as likely that the provisions of the minority bill will cause a deadlock which will result in indefinite postponement of the question or its deference to the next General Assembly. The Senate is conservative, while the House is considered one of the most radical in the history of the State. The Republican party was not pledged to public utility legislation, but Governor Lilley was committed to the idea and urged the adoption of a measure to create a commission. Frank B. Weeks, the present Governor, was elected Lieutenant-Governor, and came into the Governor's chair through the death of Mr. Lilley. He has not publicly expressed his views on the question. The *Hartford Courant* ventures the prediction that the attempt to bring the railroads under the act will result in the defeat of the measure advanced by the minority.

Financial and Corporate

New York Stock and Money Market

July 27, 1909.

The stock market during the past week can easily be described as dull but strong. Trading has been limited but prices have as a general thing been well supported. During the week Union Pacific made a new high record—reaching to-day 199½—and United States Steel common continued to be an active issue on the list. After the close of the market to-day announcement was made that the dividend on Steel common had been advanced to a 3 per cent basis. This action had been pretty well discounted and has been represented in the recent rise in the price of the stock. Traction shares have been less active, those of Manhattan showing recessions on the week's business.

The money market continues to be easy. Cash is apparently plentiful and the demand for investment securities and bonds continues to be urgent. Loans were quoted to-day: Call, 1¼ to 2 per cent; 90 days, 2¼ to 2¾ per cent.

Other Markets

There has been little activity in traction shares in the Philadelphia market during the past week, although Rapid Transit and Union Traction continued to be sold in limited quantities. Prices are practically unchanged. Electric Storage Battery continues to advance, and to-day touched 60 on transactions amounting to almost 4000 shares.

In the Boston market, tractions in small lots only are being dealt in. Massachusetts Electric preferred and Boston Elevated are more active than any of the others.

There has not been much doing in traction securities in Chicago during the past week. Chicago Railways, Series 1 and 2, have been traded in to a limited amount at advancing prices and Subway stock has been fairly active.

Trading in Baltimore continues to be mostly confined to United Railways bonds, which are still fairly active at prices that show small change. A few shares of United Railways stock have been sold about 12½.

Quotations of various traction securities as compared with last week follow:

	July 20.	July 27.
American Railways Company.....	a45¾	a45¾
Aurora, Elgin & Chicago Railroad (common).....	a10¼	a11¼
Aurora, Elgin & Chicago Railroad (preferred).....	a86½	86½
Boston Elevated Railway.....	a130	130½
Boston & Suburban Electric Companies.....	*16	*17½
Boston & Suburban Electric Companies (preferred).....	*71	*72
Boston & Worcester Electric Companies (common).....	10	a13
Boston & Worcester Electric Companies (preferred).....	a56	a50
Brooklyn Rapid Transit Company.....	78½	78
Brooklyn Rapid Transit Company, 1st ref. conv. 4s.....	85¾	85¾
Capital Traction Company, Washington.....	a137½	a139
Chicago City Railway.....	a190	a190
Chicago & Oak Park Elevated Railroad (common).....	*2½	*2
Chicago & Oak Park Elevated Railroad (preferred).....	*10	*10
Chicago Railways, ptepts, ctf. 1.....	a114	a119½
Chicago Railways, ptepts, ctf. 2.....	a38¾	a39
Chicago Railways, ptepts, ctf. 3.....	a26½	a26½
Chicago Railways, ptepts, ctf. 4s.....	a10½	a10½
Cleveland Electric Railway.....	*78	*78
Consolidated Traction Company of New Jersey.....	a77	a77
Consolidated Traction of N. J., 5 per cent bonds.....	a106	a106
Detroit United Railway.....	63	a67¾
General Electric Company.....	168	167¾
Georgia Railway & Electric Company (common).....	a93	a92
Georgia Railway & Electric Company (preferred).....	a87	85
Interborough-Metropolitan Company (common).....	15¾	14½
Interborough-Metropolitan Company (preferred).....	48	45½
Interborough-Metropolitan Company (4½s).....	80½	79¾
Kansas City Railway & Light Company (common).....	50	a49
Kansas City Railway & Light Company (preferred).....	84½	a84½
Manhattan Railway.....	a146	a146
Massachusetts Electric Companies (common).....	a14	a13
Massachusetts Electric Companies (preferred).....	a75	73½
Metropolitan West Side, Chicago (common).....	16½	a15¾
Metropolitan West Side, Chicago (preferred).....	48	47
Metropolitan Street Railway.....	a20	a20
Milwaukee Electric Railway & Light (preferred).....	*110	*110
North American Company.....	84	a83¾
Northwestern Elevated Railroad (common).....	a22	20½
Northwestern Elevated Railroad (preferred).....	a71	a71
Philadelphia Company, Pittsburg (common).....	a42	41¾
Philadelphia Company, Pittsburg (preferred).....	a43	42½
Philadelphia Rapid Transit Company.....	29¼	29½
Philadelphia Traction Company.....	a91	a90¾
Public Service Corporation, 5 per cent col. notes.....	a100½	a100½
Public Service Corporation, ctf. s.....	a89	a89
Seattle Electric Company (common).....	*105¼	*105
Seattle Electric Company (preferred).....	*103	104½
South Side Elevated Railroad, Chicago.....	a56	a56
Toledo Railways & Light Company.....	a10	a10
Third Avenue Railroad, New York.....	18½	20
Twin City Rapid Transit, Minneapolis (common).....	106	103¾
Union Traction Company, Philadelphia.....	53½	53½
United Railways & Electric Company, Baltimore.....	a12½	a12½
United Railways Inv. Co., San Francisco (common).....	37	a38
United Railways Inv. Co., San Francisco (preferred).....	53¾	53¾
Washington Railway & Electric Company (common).....	a46	a48
Washington Railway & Electric Company (preferred).....	a93	a93¾
West End Street Railway, Boston (common).....	93	94
West End Street Railway, Boston (preferred).....	a104½	*106
Westinghouse Electric & Manufacturing Company.....	85½	85
Westinghouse Elec. & Mfg. Company (1st pref.).....	a124½	a124½

aAsked.

*Last sale.

Westinghouse Report for the Year

The Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has made public its report for the year ended March 31, 1909. A comparison of the results for the years ended March 31, 1909, and 1907, and the six years ended March 31, 1906, follows:

	Year ending March 31, 1909.	Year ending March 31, 1907.	Six years ending March 31, 1906.
Gross earnings.....	\$20,606,592	\$33,026,240	\$114,618,537
Operating expenses.....	a19,955,808	28,846,665	97,726,008
Net earnings.....	\$650,784	\$4,179,575	\$16,892,529
Other income:			
Interest and discount.....	362,384	190,463	1,074,718
Interest and dividend on stocks and bonds owned.....	782,316	593,041	1,679,332
Miscellaneous royalties, etc.....	170,775	592,831	910,544
Total income.....	\$1,966,259	\$5,435,910	\$20,557,119
Deductions from income:			
Interest on bonds and debentures.....	\$1,056,808	\$827,888	\$911,662
Interest on collateral notes.....	496,515	764,465	2,955,105
Miscellaneous interest.....	647,448		
Tax on capital, premium on debentures retired, etc.....		46,250	728,257
Property and plant depreciation written off.....	513,316	b900,637	b1,864,105
Miscellaneous.....	170,854	128,707	
Total deductions.....	\$2,884,942	\$2,667,946	\$6,459,129
Balance.....	def.918,683	sur.2,767,964	sur.14,097,990
Other profit and loss credits:			
Profit and loss surplus March 31.....	x11,972,997	y12,562,507	z3,570,015
Profit on bonds purchased and retired through sinking fund.....	105,479		
Premium on stock issued.....	27,994		4,415,230
Miscellaneous.....	27,994	84,205	
Gross surplus.....	\$11,187,787	\$15,414,676	\$22,083,235
Profit and loss charge:			
Various profit and loss charges... (10%).....	c2,207,452	319,970	620,524
Dividend on preferred stock.....		(10%)399,870	
Dividend on assenting stock (also \$1,100 non-assenting)..... (10%).....		2,099,685	9,922,069
Total surplus March 31.....	\$8,980,335	\$12,595,152	\$11,540,642

a Includes factory costs, embracing all expenditures for patterns, dies, new small tools and other betterments, and extensions. Also inventory adjustments and all selling, administration, general and development expenses.

b Includes accounts and bills receivable, etc., written off. c Includes compensation and expenses of receivers and attorneys, expenses in connection with adjustment of debt, depreciation of patents, proportion of discount on bond issues of previous years written off, reserve for possible losses on accounts receivable and inactive machines and parts, and other items appertaining to prior years or of an extraordinary nature. x 1908. y 1906. z 1900.

The balance sheets as of March 31, 1909, March 31, 1907, and March 31, 1906, show assets and liabilities, respectively, of \$84,885,471, \$72,270,855 and \$69,061,995.

Under date of July 21, 1909, George Westinghouse, president of the company, wrote in substance:

"The affairs of the company were taken out of the hands of the receivers Dec. 5, 1908. The present board was elected Nov. 30, 1908, the officers were appointed Dec. 7, 1908, and an executive committee elected Jan. 5, 1909; but the board was not permanently organized until the election of Robert Mather as chairman on Jan. 19, 1909.

"The intervening time has been required to complete the adjustments resulting from the receivership and the readjustment of the debt of the company, and to determine the reductions to be made with reference to the company's business in America.

"There was a decrease in the surplus account during the year of \$2,992,662, as follows:

Loss from operations of the business after providing for all interest charges and making fair allowances for depreciation.....	\$918,683
Expenses incurred in connection with the adjustment of the debt existing Oct. 23, 1907.....	460,490
Compensation and expenses of receivers and their attorneys.....	265,883
Charged off to reduce the book value of assets, such as discount and expenses incurred in connection with bond issues of previous years; depreciation of patents, depreciation of various stocks and bonds, provision for possible losses on inactive finished parts and machines on hand at the close of the year, and other minor items of similar nature.....	1,347,606

"The loss during the fiscal year of \$918,683, after providing for interest on the debt and all expenses, is chiefly accounted for by a small volume of business, the utilization of high-priced material, by sales at reduced prices and by very considerable extra expenses incurred in completing the departmentalizing of the manufacturing operations of the company and in the rearranging of the machinery, which work was carried on without interruption by the re-

ceivers. These important changes in manufacturing methods have reduced greatly the amount of material, raw, in process and finished, required to be kept in stock for a given amount of output (the amount of material in stock, work in progress, goods on consignment and apparatus with customers on March 31, 1909, was \$9,961,182, as compared with \$17,740,178 on Oct. 23, 1907), and has also increased the space available for manufacturing operations.

"The company received from stockholders, merchandise and other creditors subscriptions to capital stock at par amounting to \$12,778,825; to 5 per cent convertible bonds at par amounting to \$3,586,000, and to 4, 5, 6 and 15-year notes \$1,392,150, making a total of new capital raised at par by the sale of stock and securities of \$17,756,975.

"Your officials estimate that the plants have an annual output capacity of \$50,000,000, and that the cash capital provided as above is ample for conducting a business of that magnitude.

"Under the provisions of the convertible bond indenture the company is required to provide a sinking fund of \$500,000 annually and to invest the same in its convertible bonds. Since the termination of the receivership the company has turned into the sinking fund \$1,500,000, covering the requirements up to the end of the present calendar year. This sum was invested in convertible bonds, yielding a profit of \$105,479.

"While there has been a decided improvement in the business of the company since the beginning of the year, it has not yet nearly reached normal proportions, although the outlook and inquiries indicate that in the near future the full capacity of your various works will be required to meet the demand."

Readjustment Plan of Interstate Railways

The committee which was appointed to consider the matter of readjusting the affairs of the Interstate Railways Company, Philadelphia, Pa., reported to the directors of the company under date of June 30, 1909. John A. Rigg, president of the company, has since addressed a letter to the holders of the collateral trust 4 per cent gold bonds of the company, enclosing the statement to the directors outlining the plan, and has asked them to assent to the proposal "as the best possible plan for the readjustment of the affairs of the company."

The plan is in the form of a letter addressed to the company by a committee of which George H. Earle, Jr., is chairman. While the power of foreclosure is given to the committee, the belief is expressed that "a satisfactory adjustment of the financial affairs of the company is possible without foreclosure * * * and that such foreclosure should only be considered as a last resort."

The plan proposes that the bondholders deposit their bonds with the Real Estate Trust Company, as trustee, which is authorized to borrow the funds required for betterments and coupon interest during a period of five years. In this way, foreclosure, with its large expenses, probable disintegration of the property, and usual dilution of the value of securities upon reorganization is to be avoided. The depositing bondholder may elect to take 6 per cent scrip or cash for his coupons. Arrangements have been made with a syndicate to buy the scrip. The amount which the trustee is authorized to borrow is such sum in excess of the earnings each year as is required for the payment of the interest and betterments, which betterments are not to exceed \$500,000 in any one year, nor \$1,500,000 in the five years.

Accompanying the plan is a letter from John A. Rigg, president of the company, containing an estimate of the net earnings during the five years, 1910-1914, and the charges against the same during those years for interest, betterments, etc. This estimate shows a deficit of \$150,000 in 1910 and of \$50,000 in 1911, and a surplus of \$50,000 in 1912. At the end of the third year the betterments to the extent of \$1,500,000 will, as the company's president estimates, all have been made and paid. Then the fourth and fifth years, 1913 and 1914, show a surplus of \$650,000 and \$750,000, respectively. The trustee will thus be enabled to return their bonds to the owners at the end of five years, freed from any charge thereon, with all the coupons fully paid and the betterments to the extent of \$1,500,000 made and paid for.

The United Power & Transportation Company guarantees the return to the bondholders of the money borrowed upon their bonds, and pledges for such repayment, in the event of failure of the plan and consequent foreclosure, stocks of the value, it is said, of \$1,500,000 now on deposit with the Real Estate Title Insurance & Trust Company under the "tripartite agreement," which stocks would be released by such foreclosure. The Interstate Railways Company also guarantees the payment of all loans and expenses.

The total of bonds outstanding against the Interstate Railways Company is nearly \$11,000,000. Counsel for the estate of Robert N. Carson has already applied to the court for permission to deposit the bonds of the company held by the estate under the above plan. These bonds are said to have a face value of \$4,000,000.

Changing the Method of Basing Copper Quotations

Heretofore quotations on the price of copper metal have been based on prices arbitrarily fixed by the quotation committee of the Metal Exchange in New York. The committee met each day and fixed a price in cents per pound which was sent out as the official quotation on copper for that day, but the price was not based on actual transactions and, as a matter of fact, the actual price at which the metal could be bought in the market often varied from a fraction of a cent above or below the "official" quotation. The board of managers of the New York Metal Exchange has now adopted recommendations whereby, hereafter, quotations sent out by the exchange will not be estimates prepared by the quotation committee, but will be based on actual transactions in copper on the floor of the exchange.

Under the old plan the prices per pound were fixed on three grades of copper, known respectively as "lake," "electrolytic" and "casting," although "casting" copper of late years has played but little part in the American markets. Furthermore, the distinction between lake and electrolytic coppers has been gradually eliminated, and the electrolytic metal has been sold indiscriminately in place of the so-called "lake" copper, which is the metal supposed to come from the Lake Superior district. Under the new rules adopted by the Metal Exchange, the quotation will be based only on one recognized grade, namely, "standard" copper, which will be divided into classes A, B, C and D, and the minimum quantity of standard copper to be dealt in shall be 25 tons of 2240 lb. each. The sellers have the option of delivering each lot of 25 tons in four classes, the classifications being based upon the percentage of assay and subject to a rebate or premium on the contract price accordingly. It is not known what changes, if any, the new rules will make in the method of basing estimates and contracts for copper wire and other products, but it is believed they will put the copper market on a more logical and definite basis.

The board of managers of the exchange also made changes in the rules applying to tin, lead and spelter. A minimum contract on pig tin hereafter will be for 5 tons instead of 10. Pig lead and spelter dealings will be for "delivery New York" and "delivery East St. Louis." The quotations on lead will be on what is known as "good merchantable brands," and in spelter on "prime virgin spelter."

Albany & Hudson Railroad, Hudson, N. Y.—Judge Fitts in the Supreme Court at Albany on July 21, 1909, appointed General Manager Raymond H. Smith as receiver of the Albany & Hudson Railroad on application by Parker, Hatch & Sheehan, attorneys for the Trust Company of America, New York, trustee under the first mortgage, on the ground that the road is unable to earn fixed charges. Myron T. Herrick, C. L. Rossiter and R. A. C. Smith have been asked by the holders of a large amount of the securities to act as a committee on behalf of the bondholders and stockholders for the purpose of bringing about a reorganization and have organized for that purpose, with I. W. Day, 100 Broadway, New York, as secretary. It is said that this committee has proposed a plan of reorganization which will eliminate all bonds now outstanding by substituting for the \$1,850,000 of bonds \$1,850,000 of preferred 5 per cent non-cumulative stock. The preferred stock of \$1,000,000 now outstanding is to be exchanged for \$1,000,000 of common stock, and for the \$750,000 of common stock \$375,000 of new common stock will be issued. It is further proposed to issue \$1,250,000 of new bonds to carry out a plan for the extension of the road, which, it is expected, will work materially to the benefit of the company.

Des Moines (Iowa) City Railway.—The report that William B. McKinley and his associates in the Illinois Traction System had concluded negotiations for the purchase of the property of the Des Moines (Iowa) Electric Company gave rise to the rumor that Mr. McKinley and his associates were negotiating for the purchase of the Des Moines City Railway, and that arrangements had practically been completed by which the Des Moines City Railway would be taken over. To an inquiry addressed to him at Washington, D. C., Mr. McKinley replied under date of July 26 as follows: "We have not purchased the Des Moines City Railway."

Kingston (N. Y.) Consolidated Railroad.—At the quarterly meeting of the directors of the Kingston Consolidated

Railroad on July 10, 1909, the question of declaring a dividend on the \$200,000 preferred stock was postponed until the meeting to be held on Oct. 9, 1909. Four per cent was paid yearly on the preferred shares of the company from its organization in 1901 up to 1908, when 2 per cent was paid in August. No dividends have been declared since then.

Meadville & Cambridge Springs Street Railway, Meadville, Pa.—The property of the Meadville & Cambridge Springs Street Railway has been sold under foreclosure for \$5,800 to the Equitable Trust Company, Pittsburgh, representing the bondholders.

Metropolitan Street Railway, New York, N. Y.—The Forty-second Street & Grand Street Ferry Railroad has filed a petition in the United States Circuit Court, asking for an order directing Adrian H. Joline and Douglas Robinson, as receivers of the Metropolitan Street Railway, to elect whether or not they will adopt a lease executed by the petitioner in April, 1893, to the Metropolitan Cross-town Railway, one of the leased lines of the Metropolitan Street Railway. It is also asked that an order be issued, instructing the receivers to pay forthwith taxes and assessments constituting a lien on the property of the petitioner secured by condemnation proceedings; to pay James A. During whatever may be due him for compensation and expenses as attorney for the company in these proceedings, and to instruct the receivers either to pay in full the tax on the special franchise of the petitioner or the amount the receivers may concede to be due by way of tax on this franchise and to further protect the property of the company against the enforcement and collection of the remainder of the tax.

New York, New Haven & Hartford Railroad, New Haven, Conn.—Charles S. Mellen, president of the New York, New Haven & Hartford Railroad, has notified the Massachusetts Railroad Commission that the New York, New Haven & Hartford Railroad is neither directly nor indirectly interested in any electric railways in Massachusetts. The company disposed of its electric railway holdings in accordance with the decree of the Supreme Court of Massachusetts requiring the company to relinquish its rights in these properties on or before July 1, 1909.

Philadelphia Company, Pittsburgh, Pa.—The stockholders of the Philadelphia Company on July 22, 1909, authorized an issue of \$5,000,000 of 10-year 5 per cent convertible debentures and an increase of the common stock from \$42,000,000 to \$47,000,000, to provide for the same.

Sao Paulo Tramway, Light & Power Company, Ltd., Sao Paulo, Brazil.—The pamphlet report of the Sao Paulo Tramway, Light & Power Company, Ltd., for the year ended Dec. 31, 1908, has recently been made public. The income account gives the gross earnings as \$2,287,410 and the operating expenses, interest on bonds, taxes, etc., as \$1,148,518, leaving a surplus of \$1,138,891. This sum, with the balance for the previous year, makes a total of \$1,795,790. Three dividends of 2¼ per cent each and one dividend of 2½ per cent were paid, amounting to \$836,538. In addition, \$300,000 was transferred to the contingent account for renewals, leaving a balance of \$695,251 to be carried forward. The assets of the company as given in the balance sheet of Dec. 31, 1908, are \$18,497,535 and the liabilities \$18,497,535. William Mackenzie, Toronto, Can., president of the company, in reviewing the work for the year said that 4.75 miles of new track had been added to the system and that the Santa Anna Railway, which was acquired last year, has been entirely replaced by an electric line which was opened for traffic on Oct. 8, 1908.

Second Avenue Railroad, New York, N. Y.—J. W. Castles, A. J. Hemphill, Henry S. Redmond and George G. Amer, Jr., have been selected as a committee of the bondholders of the Second Avenue Railroad to submit a plan for the reorganization of the company.

Tarrytown, White Plains & Mamaroneck Railway, White Plains, N. Y.—Justice Keogh has appointed H. R. Barrett, White Plains, as referee to sell the property of the Tarrytown, White Plains & Mamaroneck Railway at foreclosure. The application for the sale was made by the Knickerbocker Trust Company, trustee for the bondholders. The Tarrytown, White Plains & Mamaroneck Railway is in the hands of J. Addison Young, New Rochelle, as receiver.

Virginia Railway & Power Company, Richmond, Va.—Depositors under the plan of the reorganization of the Virginia Passenger & Power Company have been notified to present their certificates of deposit, properly endorsed, at the office of the depository, the Equitable Trust Company, New York, N. Y., and receive the new securities and cash to which they are entitled.

Traffic and Transportation

Meeting to Consider Modification of Indiana Operating Rules

The work of revising the book of rules adopted some time ago to govern the operation of interurban railways in Indiana was begun on July 22 in Indianapolis by the committee on rules of the Central Electric Railway Association composed of H. A. Nicholl, general manager of the Indiana Union Traction Company; C. D. Emmons, general manager, Ft. Wayne & Wabash Valley Traction Company; G. K. Jeffries, division superintendent, Terre Haute, Indianapolis & Eastern Traction Company; Fletcher M. Durbin, general manager, Evansville & Southern Indiana Traction Company, and A. A. Anderson, general manager, Indianapolis, Columbus & Southern Traction Company. All the members of the committee were present except Mr. Anderson.

The revision of the rules was advised by both the managers of the interurban railways and the members of the Railroad Commission. The committee organized by electing H. A. Nicholl chairman. As a text for the committee's consideration the Railroad Commission submitted the following recommendation made to it by Samuel Shane, chief inspector of the commission:

"In regard to the recent code of rules and the proposed revision of the same I am firmly impressed that rules 151 and 151 B should be revised so that it be imperative that both the conductor and motorman participate in receiving the order.

"Rule 107 should be amended by adding the words 'Giving no signals to approaching trains.' This, I think, is important, for it is quite clear to me that an accident which occurred at Chestnut Ridge on the line of the Indianapolis & Louisville Traction Company on June 23 was due to the fact that the conductor gave the motorman a signal that everything was O. K., when he had the switch in the wrong position, and a car with a red roof and other red trimming on the siding formed a background so that the motorman of an approaching car was unable to determine to his own satisfaction the position of the semaphore, and accepted the signal.

"In regard to change in certain rules which have been requested by the Indiana Union Traction Company, I think considerable care should be exercised. Rule 162 gives too much leeway to the dispatcher. Rules 115, 158 and 155, authorizing trains to meet without orders when they are unable to communicate with the dispatcher should have serious consideration before any changes are made. Some slight changes in other rules should also be made, but after they are accepted can be posted by bulletin or posters. I question the advisability of generally revising these rules, however, as there is a movement on foot to compile a national code, which will undoubtedly be done this fall, and the probability is that the electric railways in Indiana will desire to adopt the national code.

"Before such time, however, I am under the impression that it is within the province and duty of the Railroad Commission to lay down fundamental principles in regard to examining men, inquiring into their past record, keeping a correct record of them, and giving such record to other lines when asked, and to promulgate rules to govern the issuance of orders, find the responsibility of train crews, require both men to participate in receiving train orders, oblige the dispatcher personally to know that he has communicated with both trainmen, and prevent one man from signing for another.

"These are a few of the suggestions that I have to make, and after the matter has been duly considered, there will no doubt be others. I am under the impression that, aside from the rules which the commission should require, the matter should be taken up with the managers of every electric railway in the State, and they should be asked for suggestions that will tend to afford a safer system of operation, and I advise that these suggestions and recommendations be laid before the committee, to be considered before completing this work."

The recommendations made by Mr. Shane resulted in a spirited discussion by the members of the committee. As to the change recommended in Rules 151 and 151 B, the committee agreed that both the conductor and the motorman should thoroughly understand the train orders received over the telephone, but it was pointed out that on a number of roads the absence of both conductor and the motorman from the train at the same time to receive train orders would prove hazardous. It was agreed, that no change should be made in this rule at present, but it was suggested that a bulletin be issued instructing con-

ductors and motormen thoroughly to acquaint each other with all train orders received.

Mr. Nicholl explained that the request of the Indiana Union Traction Company for a change in Rule 162 so as to authorize trains to run on schedule time and meet without order when unable to communicate with the despatcher grew out of a condition on that road which made it necessary to violate the rule. He said that during a sleet storm in February the telephone wires of the Indiana Union Traction Company were down, as were all other telephone wires, and that rigid observance of the rule would have tied the entire system up for several days. Other rules in which changes were deemed advisable were considered, and after comparing interesting experiences growing out of the best observance of the present rules that those in attendance found possible, the committee adopted the following changes subject to the approval of the commission:

"1. That Rule 82 C be changed to read 'four bells' instead of 'three bells,' and that the position of present Rule C and D be reversed.

"2. That Rule 134 be amended to read as follows: Conductor must leave the car from the rear platform, and before doing so securely fasten the rear vestibule door on the opposite side from which he leaves to flag the crossing, and not give signal to motorman to proceed until after he is positive no one is attempting to board or leave his car. Before starting the motorman will look back to see that no passengers are getting on or off.

"3. That Rule 162 be amended by adding the following: Except where the train whose rights are to be restricted is blocked by authorized agent or operator, as per Rule 152.

"4. That the American Association rule be adopted in place of Rule 151.

"5. That Rule 107 be amended by adding: 'Giving no signals to approaching trains.'

"6. That the last sentence in Rule 269, which reads as follows, be eliminated: 'When flagging railroad crossings, conductors will keep rear door closed opposite to the side of the car from which they will flag crossings.'"

The Use of Fenders in Seattle

On Dec. 28, 1908, the City Council of Seattle, Wash., passed a resolution calling upon the board of public works to direct the electric railways operating in Seattle to equip their cars with fenders and wheel guards. In accordance with these instructions, A. V. Bouillon, superintendent of public utilities of the board of public works of Seattle, notified the companies under date of Dec. 31, 1908, that neither the fenders nor the wheel guards then used by them were deemed by him sufficiently efficient, and called the attention of the companies to the resolution of the City Council requiring the companies to install proper fenders and wheel guards on all cars before June 1, 1909. The companies so notified were the Seattle Electric Company, the Seattle, Renton & Southern Railway and the Loyal Railway.

Under date of June 10, 1909, Mr. Bouillon reported to the board of public works in detail regarding the effort made by the companies to comply with the order from him. He said that the Seattle Electric Company had adopted fenders and guards of its own make, and in criticism of them said that "they are coarse and rigid structures not built or fitted with due regard to a minimum of injury to persons when struck." He said that up to June 1, 1909, the company had equipped 65 of its cars with these fenders and guards, but that it was engaged in installing them on all the cars with side entrances, the new installation replacing the fenders which were formerly in use. None of the single-end cars, however, had been equipped with new fenders or guards up to this time, so that with the exception of 65 of the side-entrance cars equipped with the new fenders and guards on June 1, all passenger cars operated by the company are still equipped with fenders and guards in use at the time the board's order was issued. Mr. Bouillon said that the company equipped several of its cars during the year with Providence fenders and Worcester fenders for experimental purposes. In regard to the Seattle, Renton & Southern Railway, he said that the fenders in use by that company were imperfect as life-saving appliances for the same general reason stated with reference to the fenders of the cars of the Seattle Electric Company. The cars of the Seattle, Renton & Southern Railway are not equipped with wheel guards. In regard to the Loyal Railway, Mr. Bouillon reported that its cars are not equipped with fenders, but are fitted with automatic wheel guards of the Parmenter type or similar thereto. In regard to these devices, he said that "it is extremely doubtful if the wheel guards will prove to have any appreciable degree of efficiency as

life protecting appliances." He concluded his report as follows:

"In general, the fenders on the cars operated in Seattle, with the few exceptions noted of new types recently installed and of the Providence fenders on the cars of the Seattle-Everett Interurban line, have been of primitive design and crudely constructed and readily suggest cheapness, high degree of endurance and economy in upkeep. In my observation of fenders and wheel guards, I have reached the conclusion that these appliances are sadly neglected by the operators, and there is, in my judgment, need for more attention to these appliances with a view to keeping them up in a high state of efficiency. The height at which fenders are carried above the roadbed should receive the closest attention, having in view always carrying them at the lowest practicable elevation above the roadbed.

"Our topographical conditions make it necessary to carry fenders at an elevation above the roadbed varying from 6 in. to 10 in., depending upon the type of the cars and the grades on the line on which it is operated; and while fenders controlled by tripping gear that can be dropped by the motorman would, in my judgment, show a far higher degree of efficiency than the fender without controlling gear, yet the former is dependent upon the human element, and all should be supplemented by automatic life guards and screens to protect a body from coming under the wheels, and there is no apparent reason why a freight car operated on the public streets and places, and that may go wherever a passenger car goes, should not be provided with life-protecting appliances of the same degree of efficiency as those demanded for cars in the passenger service."

As a result of the report of Mr. Bouillon to the board of public works, A. L. Kempster, superintendent of transportation of the Seattle Electric Company, was recently arraigned in court charged with failing to provide proper fenders for the cars of his company, but was subsequently discharged by Police Judge Gordon, who held the case in advisement for several days. Similar action was proposed against the Seattle, Renton & Southern Railway and the Loyal Railway, but these cases are not expected to be brought to trial, as the opinion of the court invalidates the ordinances. In concluding his opinion, Judge Gordon said:

"The testimony of witnesses in this case showed that the fender that would be proper under the city ordinance, under which this prosecution is brought, does not exist. The ordinance specifies a certain sort of fender that would be almost a perfect machine. Such a fender has not been invented. Reasonable care has been taken by the defendant, I believe, to secure good fenders. The accident record of the company does not show that the fenders have been worthless, according to the testimony. In fact, the company's records show a large number of occasions on which the fenders have saved life. The case is dismissed."

Report of Accidents in New York in June

The Public Service Commission of the First District of New York has made public the following comparative summary of accidents occurring during June, 1909, and June, 1908, on the street and electric railways within its jurisdiction:

	June, 1908.	June, 1909.
Car collisions	167	124
Persons and vehicles struck by cars.....	1,070	928
Boarding	707	614
Alighting	1,252	1,022
Contact electricity	50	34
Other accidents	2,493	2,161
Totals	5,739	4,883
INJURIES.		
Passengers	2,517	2,148
Not passengers	639	527
Employees	634	518
Totals	3,790	3,193
SERIOUS. (Included in above.)		
Killed	42	29
Fractured skulls	16	9
Amputated limbs	10	4
Broken limbs	40	33
Other serious.....	194	135
Totals	302	210

Riding in Motormen's Vestibules Restricted

The following notice has been issued to motormen on all divisions of the Northern Ohio Traction & Light Company, Akron, Ohio, effective on July 20, 1909:

"Attention is again called to motormen operating cars in allowing passengers, employees deadheading or on duty,

and unauthorized persons to ride in front vestibule or talking in doorway of cars, etc.

"All vestibule permits are hereby cancelled and will not be honored after this date. Employees from any department, official, foreman or subordinate, will not be allowed to ride in motorman's vestibule without special authority or written order from the general manager, or general superintendent. Those who are entitled to ride in front vestibule are as follows: President, vice-president, general manager, general superintendent; division superintendents allowed to ride in vestibule only on divisions assigned to them.

"Any violation of the above rule will be cause for suspension or dismissal.

"W. H. Douglas, general superintendent. Approved, Chas. Currie, general manager."

New England Company Calls Public Attention to Its Courtesy Requirements

The Hartford & Springfield Street Railway, Hartford, Conn., in a recent traffic circular addressed the public on the subject of its relations with them and its attitude toward its employees, devoting a page to the following statement:

"It is the desire of the Hartford & Springfield Street Railway to employ only the most experienced and courteous employees, and to provide the public with the very best service possible. The following letter to its conductors, motormen, and operating heads on the subject of courtesy indicates the attitude of this company on a subject of vital interest to its patrons:

"The possession of a gift should spur one on to the development of that gift. A good disposition is a gift, the possession of which by the company's conductors, motormen and other agents means a courteous attitude toward the public, and is a matter of congratulation both to these agents and to the company itself.

"To those who have good dispositions and make use of the kindness and courtesy which are the natural offspring of such dispositions in the treatment of the company's patrons, the company extends its sincerest thanks. To those who have not this endowment, and to whom the use of kindness, courtesy and forbearance in their dealings with their fellow men has not appealed so strongly, a thoughtful consideration of the following points is suggested.

"First—The principle that underlies courteous treatment of others is simply that of doing unto others as you would they should do unto you.

"Second—The street railway business is complex, and it is not given to all to understand instinctively its complexities. Your training makes you familiar with all its details, but does not communicate that knowledge to the public. It is, however, desirable and necessary that the public should know, and to know it must ask questions. It is up to you to give all men the courtesy of a clear reply, and to give it without any suggestion of superiority born of a greater knowledge.

"Third—Words are only one means of expression, and manner is quite as important; therefore, remember that a kindly and gracious manner is not only the sign and mark of a self-respecting man, but it is to your words what oil is to machinery in making them move effectively to their purpose.

"Fourth—True courtesy is no respecter of persons. It remembers that "a man's a man for a' that," and gives a civil word and helping hand quite as readily to the "seedy" stranger as to the well-dressed patron who habitually patronizes the car.

"Fifth—Courtesy is not only something which the public have a right to expect of you, but it pays.

"It pays in the friends it makes for you personally and for the company, because you are its representatives.

"It pays in minimizing the friction of your life, as well as that between the company and its patrons.

"It pays in the personal satisfaction resulting in having done the right thing and kindly thing by your neighbor."

Safety Guard in Omaha.—The Omaha & Council Bluffs Street Railway, Omaha, Neb., has equipped one of the cars of its Farnam Street line with a Meyer safety guard to test the device with a view to its general adoption.

Interstate Commission Rules Against Special School Rates.—In a decision handed down on July 26, the Interstate Commerce Commission holds that railroads cannot give commutation rates to school children unless the same rates are open to all children within the age limits, thus affirming an Administration ruling made in October, 1909. Following this ruling numerous schools petitioned the

commission to cancel the ruling. The commission, however, declined to do so, and granted the petition for a hearing.

Pennsylvania Company Restores Old Wage Scale.—The Lehigh Valley Transit Company, Allentown, Pa., has announced an increase in wages for trainmen, to take effect on Aug. 1. This increase is simply a restoration of the wages which were in effect prior to June, 1908, when the company reduced the wages of the men on account of the financial depression. The new wages will be 19 cents an hour the first year, 20 cents the second year, 21 cents for the third year and 22 cents an hour thereafter. The wage scale in 1908 ranged from 17 cents to 22 cents an hour; 1 cent an hour advance for each year.

Steam Roads to Withdraw Twin Tickets.—It is announced that beginning on Aug. 1 the Hocking Valley Railroad and the Toledo & Ohio Central Railroad will restore their round trip rate of \$1.15 between Fostoria and Toledo. When the Toledo, Fostoria & Findlay Electric Railway was completed between Pemberville and Toledo the Hocking Valley Railroad and the Toledo & Ohio Central Railroad authorized a twin ticket rate of 80 cents between Fostoria and Toledo. The Toledo, Fostoria & Findlay Electric Railway met this rate on certain trains, but retained its charge of \$1.20 on all others.

Trailers Proposed in Philadelphia.—An official trial was made on July 19 by the Philadelphia (Pa.) Rapid Transit Company with a train consisting of a double-truck car equipped with four 40-hp motors, and a single-truck trail car equipped with one 40-hp motor. Both cars were fitted with air brakes under the control of the motorman of the first car. By placing one motor on the trailer, jolting was avoided in starting and the air brakes on the trail car eliminated jolting in stopping. The motor on the trail car is also useful for operating into the barn when the train is broken up. It is intended to use such trains for rush-hour traffic, but it has not been decided when they will be placed in operation.

Increase in Wages at Little Rock.—The Little Rock Railway & Electric Company, Little Rock, Ark., has voluntarily granted an increase in wages to its trainmen, effective on Aug. 1. The new rate of wages is as follows: 17 cents an hour for the first year, 18 cents an hour for the second year, 19 cents for the third year, 20 cents for the fourth year, 21 cents for the fifth year and 22½ cents for 10 years and over. The following is the old wage schedule paid by the company: 16 cents an hour for the first six months, 17 cents for the second six months, 17½ cents for the third six months, 18 cents for the fourth six months, 18½ cents for the fifth six months, 19 cents for the sixth six months, 19½ cents for four years, 20 cents for five years and over.

Jay P. Graves Offers Special Prize for Best Apples.—Jay P. Graves, president of the Spokane & Inland Empire Railroad, Spokane, Wash., has offered a \$100 silver cup as a special prize for the best 10 boxes of apples, any variety, grown tributary to the electric railway. The apples are to be on exhibition at the National Apple Show and the award will be made by the judges at the show. The Spokane & Inland Empire Railroad is encouraging the fruit-raising industry, especially apples, along its lines, and special demonstration trains of benefit to fruit growers with instructions on pruning and spraying have become an annual feature, as pointed out in the article on the company's "Fruit Special," which was described on page 790 of the ELECTRIC RAILWAY JOURNAL of April 24, 1909.

Purpose of the Philadelphia Rapid Transit Company's Hint Cards.—The Philadelphia (Pa.) Rapid Transit Company announces that the hint cards, mention of which was made on page 101 of the ELECTRIC RAILWAY JOURNAL for July 24, 1909, will be issued every second week, so as to alternate with its present accident bulletins. The first issue of the hint cards was distributed among the men last week. These cards will deal entirely with accident work, and will be designed with the object in view of briefly directing the attention of the men to certain of the more important features. The cards will be numbered and dated. The company suggests that the men save them as they are received from time to time, with a view to glancing over them occasionally and of thus refreshing their memory, as the cards will be made as interesting and readable as possible.

Folder of the Oregon Electric Railway.—The Oregon Electric Railway, Portland, Ore., has issued its first folder describing the territory served by its lines in the Willamette Valley. On the inside pages there is printed, in colors, a panoramic map 28 in. x 13 in. of the company's system and of other lines with which it connects. The covers are

printed in colors and are decorated with a view of the Willamette Valley and a three-car train of the Oregon Electric Railway. On July 14 the company placed eight new trains in service on its system, two of which were put on the Portland-Salem division and six on the Forest Grove division. The Oregon Electric Railway now operates 10 trains to and from Salem, and nine trains each way to Forest Grove. The new service will include a theater train on each division. This train will leave Portland for Salem at 11 p. m. and for Forest Grove at 11.15 p. m.

Trolley Rides in City and Country.—This is the title of a folder issued by the Detroit (Mich.) United Railway in which the principal points of interest along the different divisions of the company's system are briefly described and directions given for visiting them. The publication also contains a guide for making connections and gives rates of fare and information about special cars, the express and baggage department of the company and fast limited cars. Two maps accompany the text. One shows connections made with electric railways in Toledo, and the other a panoramic view in colors of Detroit and other cities which are connected by the company's interurban lines. The front cover is a harmonious combination of green and white, with a scene from a wooded spot along the company's lines with patrons enjoying water sports. A car surmounts the cover as the insignia of the company.

Excursion Business of the Washington, Baltimore & Annapolis Electric Railway.—The Washington, Baltimore & Annapolis Electric Railway, Baltimore, Md., has succeeded in building up a remarkable list of connections with foreign lines at Washington, Baltimore and Annapolis. On the show window of the company's new office in the Evans Building, Washington, a few doors from the Treasury, the company has listed excursions to Boston, Providence, Philadelphia, New York, Atlantic City, Savannah, Newport News, Baltimore, Annapolis and eight other seaboard cities which involve connections at Baltimore with the steamers of the Merchants' & Miners' Transportation Company, the Baltimore & Philadelphia Steamboat Company, and the Western Maryland Railroad, and at Annapolis with the steamers of the Tolchester Steamboat Company. From Baltimore and Annapolis through tickets are also sold for connections at Washington for Mount Vernon, Marshall Hall, Great Falls of the Potomac, Chesapeake Beach and Colonial Beach. That these connections have proved popular with the people of Washington, Baltimore and Annapolis is witnessed by the fact that on July 4, 1909, more people were carried from Baltimore and Annapolis to Mount Vernon than from Washington, and that the equipment of the company is taxed to its capacity in carrying excursionists for the Chesapeake Bay steamer connections at Annapolis. In a word, these connections furnish a volume of business for long haul over the Washington, Baltimore & Annapolis Electric Railway which otherwise could not be expected.

Traffic Circulars of the United Railway & Electric Company.—The United Railways & Electric Company, Baltimore, through its excursion agent, Benjamin B. Long, has issued a number of very interesting traffic circulars. They are entitled "Trolley Trips In and Around Baltimore," "Gwynn Oak Park," "Seeing Ourselves as Others See Us," "Souvenir of Picturesque Gwynn Oak Park," and "Bay Shore Park." The company has also issued a special illustrated circular regarding its chartered cars for private parties which tells about the advantages of the cars and the arrangements that can be made for chartering them. "Trolley Trips In and Out of Baltimore" contains a list of points of interest in the city, the location of the principal city parks and directions for reaching them, the fares for trips out of the city and the fares for city and suburban lines, a schedule of night cars and other information of value to trolley patrons. The circular on Gwynn Oak Park concerns itself particularly with that resort and contains typical views in the park. "Seeing Ourselves as Others See Us" is a four-page pamphlet containing what has been said about Gwynn Oak Park and Bay Shore Park by men prominent in public life. "Souvenir of Picturesque Gwynn Oak Park" contains the description of the park and its amusements and pictures of scenes in the park. The circular on Bay Shore Park is a reprint of a similar work published by the company in 1908. The park is located on Chesapeake Bay and en route to it are some beautiful scenes and points of historic interest. The fact that this circular has been reissued shows that there has been considerable demand for it and that it has served well the purpose for which it was originally prepared. The company has also issued a special traffic circular on its funeral car, Delores. Interior and exterior views of this car are shown and a plan of the seating arrangement is presented.

Personal Mention

Mr. Frank J. McCormick, for some time a conductor on the Toledo Urban & Interurban Railway, Toledo, Ohio, has been appointed chief train dispatcher of the road, with headquarters at Bowling Green.

Mr. B. J. Jones, manager of the electrical department of the Union Gas & Electric Company, Cincinnati, Ohio, has been appointed to succeed Mr. W. A. Gibbs as district manager of the Ohio Electric Railway, with headquarters at Springfield.

Mr. C. R. McKay, formerly manager and superintendent of the lighting and power departments of the Toledo Railways & Light Company, Toledo, Ohio, has been appointed manager of the Union Light, Heat & Power Company, Covington, Ky.

Mr. J. P. Van Leuven, division superintendent in charge of the Walnut Hills car house of the Cincinnati (Ohio) Traction Company, has been appointed assistant superintendent of the company to succeed Mr. H. G. Gilpin, who has resigned to take charge of the railway and lighting properties of the Schoepf interests at Lima.

Mr. H. Gordon Gilpin, who has been connected with the operating department of the Cincinnati (Ohio) Traction Company for some time as assistant superintendent of the company, has been appointed district manager of the Lima & Toledo Electric Railway, Lima, Ohio, and district manager of the Cincinnati, Milford & Loveland Traction Company, Cincinnati, Ohio, to succeed Mr. F. T. Hepburn. Mr. Gilpin has been associated with Mr. W. Kesley Schoepf, president of the Ohio Electric Railway, for about 10 years, having served under Mr. Schoepf in Washington, D. C. Mr. Gilpin's first position in Cincinnati was with the Millcreek Valley Electric Railway, but after four years' service with that company he was made assistant superintendent of the Cincinnati Traction Company.

Mr. W. H. Thomson, Jr., has been appointed resident engineer and assistant general manager of the San Antonio (Tex.) Traction Company. Mr. Thomson was graduated from Cornell University in 1898 with the degree of mechanical engineer. After leaving college, he entered the service of the United States Navy as assistant engineer, in which capacity he served for eight months. Mr. Thomson then spent about 18 months in the testing department of the General Electric Company and after holding a number of positions of short tenure he went to Corsicana, Tex., and built an electric railway system for the Corsicana Traction Company, and on its completion became general manager of the company and general manager of the Corsicana Gas & Electric Company, continuing in these capacities for three years. Mr. Thomson was then appointed assistant to the general manager of the St. Paul (Minn.) Gas Light Company, but resigned from this position to become general manager of the Union Light, Heat & Power Company, Fargo, N. D. It was from this position that he resigned to become resident engineer and assistant general manager of the San Antonio Traction Company. Mr. Thomson also acts in the same capacities for the San Antonio Gas & Electric Company.

Mr. Harold C. Beatty has been appointed assistant general manager of the Syracuse & South Bay Electric Railroad and assistant to the general manager of the Syracuse, Lake Shore & Northern Railroad, Syracuse, N. Y., both of which are controlled by what is known as the Beebe Syndicate. Mr. Beatty will also continue to act as secretary of both companies. Mr. Beatty was graduated from the Law Department of the University of Michigan in 1900 and immediately became associated with Senator George B. Davis, of Detroit, in the promotion of the Detroit, Utica & Romeo Railway. This road, after construction had been commenced, was sold to the Everett-Moore Syndicate, and Senator Davis and Mr. Beatty went to Lexington and organized the Blue Grass Consolidated Traction Company, which had for its purpose the construction of a system of interurban railways radiating out of Lexington. After securing all the franchises for the company and commencing construction on two of the proposed lines, the financial depression of 1903 affected the company and it went into the hands of a receiver in the spring of 1904. In 1905 Mr. Beatty located in Syracuse and has been connected with the Beebe Syndicate since that time. He had charge of the claim department of the Auburn & Syracuse Electric Railroad, the Rochester, Syracuse & Eastern Railroad, the Auburn & Northern Electric Railroad, Syracuse, Lake Shore & Northern Railroad, and the Syracuse & South Bay Electric Railroad, in addition to acting as secretary and assistant secretary of the companies mentioned.

Construction News

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

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

RECENT INCORPORATIONS

Fort Wayne & Toledo Electric Railway, Harlan, Ind.—Incorporated to build an electric railway from Fort Wayne to Bryan, Ohio, a distance of 55 miles. Headquarters, Fort Wayne. It is said that arrangements have been made to operate cars over the Toledo & Indiana Railway Company's line from Bryan to Toledo and when the new railway is completed there will be a through service from Fort Wayne to Toledo. Capital stock, \$100,000. Incorporators: E. A. Tennis, Garden City, Kan.; C. H. Baker, Philadelphia, Pa.; R. L. Bastress and others. [E. R. J., July 24, '09.]

Hornell-Bath Railway, Hornell, N. Y.—Incorporated to construct an electric railway from Hornell to Bath, 24 miles. Capital stock, \$250,000. Directors: Charles Adsit, C. H. Armsted and John M. Finch, Hornell, and J. F. Turk, Hammondsport. [E. R. J., Jan. 30, '09.]

Cleveland (Ohio) Traction Company.—Incorporated to build an electric railway in Cleveland. It is stated that Herman J. Schmidt, who has applied for franchise rights in Cleveland, proposes to transfer his grants to this company. Capital stock, \$10,000. Incorporators: H. J. Schmidt, Arthur F. May, O. F. Leisey, T. G. Fitzsimmons and James Lawrence. [E. R. J., April 10, '09.]

Umatilla Railway & Electric Power Company, Pendleton, Ore.—Incorporated for the purpose of constructing about 200 miles of electric railway in Umatilla County, one branch of the system to extend south from Pendleton through Pilot Rock, Nye, Alba, Ukiah and into Dale; the other branch to extend northwest from Pendleton to Umatilla. Power is to be developed from Camas Creek. Surveys are now being made for the proposed lines. Capital stock, \$100,000. Incorporators: C. J. Smith, Pendleton; Douglas Belts and A. R. Turner. [E. R. J., July 17, '09.]

***Westmoreland Railroad, Houston, Tex.**—Chartered to build a railway other than steam power from Houston to Bellaire, a distance of 7 miles. Capital stock, \$40,000. Incorporators: W. W. Baldwin, Max Eggert, A. J. Condit and R. B. Henderson.

FRANCHISES

Auburn, Cal.—An application for a franchise for a narrow-gage electric railway to run from Colfax to Bath, 1 mile east of Forest Hill, has been made by W. S. Fletcher, Pasadena, to the Board of Supervisors in Auburn. The railway will be 16 miles in length. [E. R. J., July 10, '09.]

Fresno, Cal.—The franchise applied for by the Fresno, Hanford & Summit Lake Interurban Railway for an electric railway in Fresno will be sold by the Board of Trustees on Aug. 16 to the highest bidder. [E. R. J., June 26, '09.]

Santa Rosa, Cal.—The City Council has granted a franchise to the Sonoma & Lake County Railroad to construct an electric railway in Santa Rosa. The railway is to connect Cloverdale, Preston and Lakeport. A. E. Dickinson, Ukiah, president. [S. R. J., Nov. 30, '07.]

Wilmington, Cal.—The Board of Trustees has granted to the Pacific Electric Railway a 50-year franchise to construct a railway on certain streets of Wilmington.

Pueblo, Col.—The Kansas-Colorado Railroad has petitioned the City Council asking that its franchise be changed so as to provide for the construction of a steam railroad instead of an electric railway. S. H. Atwater, Canon City, president. [E. R. J., Dec. 19, '09.]

Jackson, Ga.—The City Council has granted a franchise to the Middle Georgia Interurban Railway to build an electric railway into Jackson. W. F. Smith, Flovilla, who is promoting the railway, is now engaged in grading it from Indian Springs to Jackson. The franchise allows the company three years in which to build the railway, which is to be extended from Jackson to Griffin. [E. R. J., March 27, '09.]

Aurora, Ill.—The City Council has granted to the Aurora, Elgin & Chicago Railroad a franchise to build an electric railway through Aurora.

Carpenterville, Ill.—The City Council has granted to the Elgin, Woodstock & Lake Geneva Railroad a 50-year franchise to operate a street railway through Carpenterville. The franchise provides that the company must complete the railway within a year and file a bond of \$10,000 within 60 days after the passing of the ordinance. J. A. Kirkland, Elgin, is interested. [E. R. J., March 27, '09.]

Chenoa, Ill.—The Joliet & Southern Traction Company has applied to the City Council for a franchise to enter Chenoa. Lee Fisher, electrical and chief engineer.

Galesburg, Ill.—The City Council has granted to S. F. Atwood, secretary of the Peoria & Galesburg Railway, a 25-year franchise to operate a street railway in Galesburg. [E. R. J., July 24, '09.]

Genoa, Ill.—The Board of Trustees has granted to the Woodstock & Sycamore Traction Company a 50-year franchise to build a street railway at Genoa.

Kankakee, Ill.—The City Council has granted a 20-year franchise to the Kankakee Electric Railway to extend its electric railway on certain streets of Kankakee.

Ironwood, Mich.—The Twin City Railway has applied to the City Council for a franchise to extend its railway to Bessemer.

Baker City, Ore.—The City Council has granted to Anthony Mohr a franchise for a street railway in Baker City. [E. R. J., June 19, '09.]

***Jacksonville, Ore.**—A franchise has been granted to the Jackson County Light & Power Company over the roads of the county, the company intending to construct an electric railway traversing the Rogue River Valley.

Wheeling, W. Va.—The Wheeling Rapid Transit Company has applied for a franchise to the Board of Commissioners to operate an electric railway through Ohio County. A. M. Schenk, president. [E. R. J., June 26, '09.]

TRACK AND ROADWAY

Beebe, Ark.—The proposed electric railway from Conway to Beebe via Vilonia, a distance of 36 miles, has been taken up by the business men of these cities. The estimated cost of construction and equipment is approximately \$500,000. The railway is to be extended to Des Arc, 62 miles. J. N. Simpson and Senator G. Bush are interested. [E. R. J., July 3, '09.]

Pacific Electric Railway, Los Angeles, Cal.—Work has been started for the extension of this railway from Upland to Claremont and then on to Pomona at a point near Lordsburg, where the Pomona City route will be joined onto the Southern Pacific Railroad tracks of the Covina branch.

Meriden, Middletown & Guilford Railway, Meriden, Conn.—This company, which proposes to build an electric railway from Meriden to Guilford, a distance of 20 miles, has been organized with the following officers: Frances Atwater, Meriden, president; Joseph Merriam, Middletown, vice-president; Eugene F. Hall, Meriden, secretary, and Charles E. Jackson, Middletown, treasurer. Directors: I. E. Palmer, Jos. Merriam, D. Luther Briggs and C. E. Jackson, Middletown; A. H. Auger, F. Atwater, J. H. White and others. [E. R. J., July 10, '09.]

Carmi-Fairfield Traction Company, Burnt Prairie, Ill.—The ELECTRIC RAILWAY JOURNAL is officially advised that this company, which is not yet chartered, will construct an electric railway, connecting Carmi, Sumpter, Liberty and Fairfield, a distance of about 25 miles. Construction will be begun on or about Sept. 1. The company will operate 8 passenger cars and 24 freight cars. The power station and shops will be located at Burnt Prairie. Power will be furnished for lighting. Capital stock authorized, \$50,000, preliminary. E. S. Lawrence, St. Louis, Mo., chief engineer. [E. R. J., July 17, '09.]

Danville, Kankakee & Crescent Traction Company, Crescent City, Ill.—It is reported that this company will operate gasoline motor cars on its proposed railway, which will connect Jamesburg, Potomac, Rankin, Cissna Park, Crescent City and Kankakee. The company has purchased land in Crescent City for a depot. J. B. Hansbrow and J. P. Sterrenberg, Crescent City, are interested. [E. R. J., May 29, '09.]

Murphysboro Electric Railway, Heat, Light & Power Company, Murphysboro, Ill.—John G. Hardy, secretary and treasurer, announces that this company expects to place, during the next two months, contracts for building one-half mile of track, road bed, etc., and that contracts have been let to extend one-fourth mile of track to Iron Mountain station.

Oil Belt Traction Company, Oblong, Ill.—This company has begun grading on its proposed electric railway from Charleston to Bridgeport. G. E. Groves, Oblong, is interested. [E. R. J., July 10, '09.]

Peoria (Ill.) Railway Terminal Company.—This company announces that it expects to place, during the next six weeks, contracts for laying about 2½ miles of double track.

Yorkville & Morris Railroad, Yorkville, Ill.—Hugh G. Palmer, president and chief engineer, writes that this company, which is about to be reorganized and new officers

ected, will soon resume work on its proposed electric railway connecting Yorkville, Lisbon and Morris, a distance of 22 miles. The railway, which is to be standard gage, will eventually be extended down the Fox River to Ottawa. The company will operate 18 gasoline motor cars. The repair shops are to be located in Yorkville. Capital stock authorized, \$500,000; bonds authorized, \$500,000. The company desires to communicate with financial interests to sell its bonds. [E. R. J., July 17, '09.]

Pittsburgh & Kansas City Railway, Pittsburgh, Kan.—This company advises that it expects to build immediately an extension a distance of $2\frac{3}{4}$ miles to Mulberry.

Boston (Mass.) Elevated Railroad.—This company has placed an order with the Pennsylvania Steel Company for 1500 tons of girder rails.

***Clinton, Miss.**—The Business Men's League, of Clinton, is said to be interested in a plan to construct an electric railway connecting Clinton and Jackson. R. H. Henry, chairman.

North Missouri Central Railroad, Mexico, Mo.—At a meeting at Ashland, 15 miles southeast of Columbia, \$10,000 was raised as a bonus for the building of this railway from Mexico to Jefferson City, 60 miles. Already \$6,000 has been raised and \$200,000 must be raised before construction will be started. O. F. Spaete, St. Louis, president. [E. R. J., July 24, '09.]

Springfield (Mo.) Traction Company.—It is stated that this company has contracted for 20,000 lbs. of cement from the Seamon Coal, Cement & Sand Company, to be used in the proposed extensions which will be made during the year.

New York & Long Island Traction Company, Hempstead, N. Y.—It is reported that this company is planning to extend its railway from Hicksville through Woodbury and Coldspring Harbor to Huntington.

Oklahoma City (Okla.) Railway.—This company writes that it expects to construct about 5 miles of city track.

Nipissing Central Railway, North Cobalt, Ont.—The ELECTRIC RAILWAY JOURNAL is officially advised that this company, which is to build a standard gage electric railway to connect Cobalt Port, Cobalt and Haileybury, has completed the road bed and is now ready to lay track and ties. The company will furnish power for lighting. Capital stock authorized, \$1,000,000; issued, \$250,000. Officers: J. W. Fitzpatrick, North Cobalt, president; P. L. Utley, Escanaba, Mich., vice-president; S. Alfred Jones, Haileybury, secretary; R. B. Stack, treasurer, and Clarence B. Henry, electrical and chief engineer, North Cobalt. [E. R. J., July 17, '09.]

Coos Bay, Oregon & Idaho Railway, Marshfield, Ore.—The ELECTRIC RAILWAY JOURNAL is officially advised that this company, which proposes to build a railway, operated by steam or other motive power, from North Bend and Marshfield, Ore., to Boise, Idaho, is now making surveys. Officers: P. Hennessey, Marshfield, president and general manager; Wm. Grimes, Marshfield, vice-president; J. R. Smith, North Bend, secretary; J. V. Pugh, North Bend, treasurer, and F. A. Haines, Marshfield, chief engineer. [E. R. J., July 10, '09.]

***McKeesport & Portvue Street Railway, McKeesport, Pa.**—It is stated that construction work will be started within a few days on the proposed street railway between McKeesport and Portvue by the Realty Company, McKeesport, which is promoting the project. It is the plan to eventually extend the line to Clairton and Elizabeth. Officers: James F. Woodward, president; Israel A. Simon, secretary and treasurer; Thomas W. White, engineer.

Duquesne & Dravosburg Street Railway, Pittsburgh, Pa.—T. F. Van Kirk, 1210 Ridge Avenue, Coraopolis, secretary, writes that this company will commence construction on its double-track electric railway from Duquesne to Dravosburg via Duquesne Annex within a few weeks. It will be about 3 miles long. Power will be purchased. Capital stock, \$50,000. Headquarters, 1351 Frick Annex, Pittsburgh. Officers: Fred W. Scott, 1351 Frick Annex, Pittsburgh, president; J. C. Cato, Aliquippa, vice-president; Adam J. Krill, Aliquippa, treasurer, and Douglas & McKnight, Union Bank Building, Pittsburgh, chief engineers. [E. R. J., July 3, 1909.]

Pittsburgh (Pa.) Railways.—This company will soon begin operating cars over the old Pittsburgh & Castle Shannon Railroad from Mt. Washington Street to Castle Shannon, 7 miles. The company purchased the Pittsburgh & Castle Shannon Railroad some years ago, and has now entirely reconstructed the roadbed and electrified the line.

Chattanooga, Tenn.—Bowdre Brown and associates, who are promoting the proposed electric railway between Chat-

tanooga and its suburbs, announce that they have not yet incorporated and that they have just applied to the City Council for a franchise. A franchise has been secured from the County Court. The railway, which is to be about 50 miles in length, will be standard gage and construction will be started within six months. The company will operate 50 cars and will purchase power from the Chattanooga & Tennessee River Power Company. Officers have not yet been elected. [E. R. J., July 17, '09.]

Russell-Prater Railway, Bessie, Va.—C. M. Crawford, Ironton, Ohio, secretary, advises that this railway, which is to be built in Dickinson County, connecting with the Carolina, Clinchfield & Ohio Railway, will be operated by steam and not by electricity, as stated in a recent issue. [E. R. J., July 17, '09.]

***Big Stone Gap, Va.**—An electric railway 60 miles in length, connecting the agricultural districts of Lee County with the Wise coal fields, is being agitated by capitalists represented by Alexander McD. Allen, Toronto, Ont. The power will be furnished from the Powell River at a point near Jonesville.

Cle Elum-Roslyn Railway & Power Company, Roslyn, Wash.—This company has started the final survey for its interurban electric railway from Roslyn to Cle Elum via Jonesville, a distance of 17 miles. [E. R. J., June 26, '09.]

Lake Washington Electric Railway, Seattle, Wash.—J. R. McLaughlin, 1108 American Bank Building, Seattle, president, advises that this company, which was incorporated June 24, 1909, will commence construction work, within a few months, on its railway in Seattle. The railway will be operated by electricity, which will be purchased. Headquarters, 1108 American Bank Building, Seattle. Capital stock, \$50,000. Officers: F. F. Mead, vice-president, and Paul C. Murphy, treasurer, 505 American Bank Building, and E. T. Clark, secretary, 1108 American Bank Building, Seattle. [E. R. J., July 17, '09.]

Spokane (Wash.) Traction Company.—Construction work has been started by this company on the Lincoln Heights extension, which is to run to Twenty-ninth Avenue and Freya Street, a distance of over 3 miles.

Merrill Railway & Lighting Company, Merrill, Wis.—It is stated that this company plans to make a number of improvements to its railway. Several new lines will be built.

SHOPS AND BUILDINGS

Connecticut Company, Bridgeport, Conn.—It is stated that C. W. Blakeslee & Sons, New Haven, who have been awarded the contract by the Connecticut Company for the construction of its proposed car house at Bridgeport, will commence work within a few days. The buildings, which will cost approximately \$250,000, will be fireproof structures of reinforced concrete. As previously reported in the issue of Aug. 8, 1908, there will be two large one-story buildings, one for repair shops, etc., north of the railroad station fronting on Congress Street, with a second story on that side for quarters for motormen and conductors. The second building will be built east of the railroad station, and will be used chiefly for storage for open and closed cars in season.

Chicago, South Bend & Northern Indiana Railway, South Bend, Ind.—It is reported that this company has selected a site in Mishawaka on Third Street and Main Street on which to erect an interurban railway station.

Syracuse (N. Y.) Rapid Transit Company.—The new repair shops now being erected by this company on Wolf Street, Syracuse, are expected to be completed by Oct. 1, according to W. J. Harvie, chief engineer. The shops will have a capacity of about 25 cars a month.

Seattle, Renton & Southern Railway, Seattle, Wash.—This company has purchased ground in Renton, on which it shortly will begin the erection of car houses and shops.

POWER HOUSES AND SUBSTATIONS

Peoria (Ill.) Railway Terminal Company.—This company is considering the purchase of two units and three boilers for its power station.

Pittsburgh & Kansas City Railway, Pittsburgh, Kan.—It is announced that this company will soon erect a power station near Franklin, Mo.

Meridian (Miss.) Light & Railway.—This company expects to build an addition to its power house and install a 1500-hp engine and a 1000-kw generator.

Albany & Hudson Railroad, Hudson, N. Y.—It is stated that this company will install a steam turbine at its Stuyvesant Falls power station.

Scioto Valley Traction Company, Columbus, Ohio.—This company has recently purchased a 500-hp boiler, a stoker and shop tools for its power house and shops.

Manufactures & Supplies

ROLLING STOCK

Sabraton Railway, Morgantown, W. Va., expects to purchase one car.

Chicago (Ill.) City Railway is planning to purchase 50 city cars and two funeral cars.

Kansas City Railway & Light Company, Kansas City, Mo., is reported to be in the market for 25 motor and 10 trail cars.

Peoria (Ill.) Railway & Terminal Company is in the market for a combination snow plow, sprinkler and line car.

Maryland Electric Railways, Baltimore, Md., will purchase three cars at an early date.

Southern Pacific Railroad (Electric Division), Oakland, Cal., contemplates purchasing 80 cars, 40 of which will be motor cars and 40 trailers.

Colfax Springs (Ia.) Railway has purchased two trail cars and one 10-ton coal car from the Dorner Railway Equipment Company, Chicago.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has ordered two express cars from the Niles Car & Manufacturing Company, Niles, Ohio.

Cedar Rapids & Iowa City Railway & Light Company, Cedar Rapids, Ia., has purchased four 50,000-lb. M. C. B. box cars and two refrigerator cars from the Dorner Railway Equipment Company, Chicago.

Metropolitan Street Railway, New York, N. Y., recently placed an order with the General Electric Company for 250 airbrake equipments to be used on cars being remodeled for pay-as-you-enter service on its lines.

Nashville (Tenn.) Interurban Railway has decided not to buy second-hand equipment, as reported in the *ELECTRIC RAILWAY JOURNAL* of June 19, 1909, and has placed an order for cars with The J. G. Brill Company and for equipment with the General Electric Company.

Lawrence Railway & Light Company, Lawrence, Kans., has just ordered seven open motor cars from the St. Louis Car Company to be mounted on St. Louis No. 9 trucks. These cars are in addition to those mentioned in the *ELECTRIC RAILWAY JOURNAL* of July 10, 1909.

Louisville & Eastern Railway, Louisville, Ky., has completed arrangements for taking possession of the five large interurban cars which were built on its specifications several months ago by the American Car & Foundry Company. This company will also purchase three interurban express cars.

Keokuk Electric Railway & Power Company, Keokuk, Ia., has purchased three second-hand 20-ft. motor cars, mounted on Brill 21-E trucks, from the Dorner Railway Equipment Company, Chicago. Mention of the contemplated purchase of these cars was made in the *ELECTRIC RAILWAY JOURNAL* of April 24, 1909.

Augusta Railway & Electric Company, Augusta, Ga., mentioned in the *ELECTRIC RAILWAY JOURNAL* of April 17, 1909, as being in the market for cars, has placed an order with the St. Louis Car Company for six semi-convertible, single-truck cars, 21 ft. long, for delivery on Oct. 1, 1909. Brill 21-E trucks will be used with these cars.

Louisville (Ky.) Railway has placed an order for 33 city car bodies with the St. Louis Car Company. The trucks have not yet been purchased. These cars are to be equipped with Westinghouse motors and with National Brake & Electric Company's air brakes. Mention of the contemplated purchase of these cars was made in the *ELECTRIC RAILWAY JOURNAL* of June 26, 1909.

Jacksonville (Fla.) Electric Company, mentioned in the *ELECTRIC RAILWAY JOURNAL* of May 1, 1909, as contemplating the purchase of some pay-as-you-enter cars, has ordered five cars from the Cincinnati Car Company. The bodies will be 31 ft. long, mounted on Standard Motor Truck Company's type 0-50 trucks, equipped with GE-81 four-motor equipments and General Electric airbrakes, and will be built under the license of the Pay-as-You-Enter Car Corporation.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has placed an order for 100 city cars and trucks with the St. Louis Car Company. The cars are to be 50 ft. over all, be built of steel below the window rail and are to be of the pay-as-you-enter type and to have steel wheels. They will be heated by Peter Smith Heater Company's No. 1-c heaters, which are especially designed for these cars. Hale & Kilburn seats were specified. The cars will each have a seating capacity of 50. Six of the cars are to be delivered on Nov. 15, and six additional are to be delivered each succeeding week until the order is filled.

TRADE NOTES

Ray D. Lillibridge, New York, N. Y., has removed his office to 100 Broadway, suite 20, 21, 22, and has taken into partnership William L. Rickard. Continuing to devote themselves to technical publicity, Messrs. Lillibridge and Rickard will conduct the business as Ray D. Lillibridge.

Falk Company, Milwaukee, Wis., has filled orders for its hardened centers, steel bound, and special work and solid manganese railroad crossing which were received early in the season from the group of roads controlled by the Huntington Syndicate in Los Angeles, Cal., the Northern Electric Company and the Fresno Traction Company. The Falk Company has recently received orders from the Los Angeles (Cal.) Railway for 14 solid manganese crossings and several layouts. It is building a large extension to its foundry, increasing its pattern storage facilities and otherwise enlarging its plant to better handle its increased business.

John A. Roebling's Sons Company, Trenton, N. J., has an interesting exhibit at the Alaska-Yukon-Pacific Exposition in Seattle, Wash. It includes a model showing a span of catenary construction with a miniature trolley car beneath. The span is 14 ft. 6 in. long, divided into 14 equal spaces. The supporting strand is 3/16 in. in diameter; the trolley hangers are made of galvanized wire and a grooved copper wire of small size represents the trolley wire. The exhibit also contains a display of bare and insulated wires and electrical cables of all kinds, the different processes undergone in the manufacture of wire being shown by samples, beginning with ore and continuing through pig iron, ingots, billets and rods to drawn wire. The samples of wire range from the largest diameter to a diameter of 0.001 in. More than 50 different kinds of wire ropes are also shown. The exhibit is located in Machinery Hall.

ADVERTISING LITERATURE

Eureka Tempered Copper Works, North East, Pa., have issued a very handsomely printed catalog of trolley wheels of various types made of high-grade bronze. A number of complimentary letters from users of these wheels are reprinted.

Goldschmidt Thermit Company, New York, N. Y., is distributing a booklet on the butt welding of wrought iron and steel pipes by the thermit process and a pamphlet entitled "Metals and Alloys Free from Carbon Produced by the Thermit Process."

D & W Fuse Company, Providence, R. I., is mailing its July price-list for Deltabeston magnet wire. The company is manufacturing coils with Deltabeston magnet wire insulated with pure asbestos materials throughout and rendered both heat-proof and moisture-proof by a new process of the company.

Industrial Progress for July, published at Milwaukee, Wis., is devoted largely to articles descriptive of important projects on the Pacific Coast. Among the articles which appear are the following: "High Head Reaction Turbine, 9700 Hp at the Centerville Plant of the California Gas & Electric Corporation," "Industrial Growth on the Pacific Coast," "Our Trade with the Countries Bordering on the Pacific" and "San Anselmo Substation of the Northwestern Pacific Railroad."

Trolley Supply Company, Canton, Ohio, has printed a 60-page catalog, with a complete description and illustrations of the various electric railway supplies which it manufactures. These include the Knutson trolley retriever No. 2, Peerless retriever, Peerless roller bearing trolley base, National roller and ball bearing trolley base No. 2, Ideal trolley catcher, Star headlight, New Climax combination arc and incandescent headlight, plain arc headlight and the semaphore incandescent headlight. Each of the articles and its repair parts are illustrated and accompanied by directions for their operation. The publication also contains a wiring diagram for the combination arc and incandescent and plain arc headlight.

Wonham, Magor & Sanger, New York, N. Y., sole agents of the American Automatic Switch Company, New York, N. Y., have issued catalog "C" descriptive of the American electric switch-throwing machine. There is a short introduction on the value of throwing switches by electricity and a review of the past methods of switch throwing. The description of the machine covers the switch-throwing mechanism, the stuffing box, the relay and fuse boxes and the line contactor. Directions are given for installing the machine and for inspecting it. Its operation is also explained under a separate heading, wiring diagram accompanying the text. The machine as installed in Washington, D. C., was described in the issue of the *ELECTRIC RAILWAY JOURNAL* of April 17, 1909.