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

Separate Cars for Women

The practicability of reserving for the exclusive use of women the rear car of a train in rush hours where traffic is heaviest will be given a thorough trial by the Hudson & Manhattan Railroad, of New York. Upon the result of this experiment will depend the introduction of a similar innovation by the Interborough Rapid Transit Company in the trains of the New York subway, although the conditions under which the two systems are operated are dissimilar in the vital point of congestion. The Hudson River tunnel system started the experiment in recognition of a public agitation before the New York Public Service Commission, First District, that measures be taken to overcome the crowding of women in subway trains during rush hours, and it is entitled to the credit which it has received for acquiescence in what has seemed to be a public demand. Following this action of the Hudson & Manhattan road, the Interborough company signified its willingness to make a similar experiment if the commission should so direct, and observations will be taken to determine the effectiveness and value of the plan during the preliminary trial on the Hudson tunnel system. It is, of course, possible that the scheme might work to advantage with the relatively light traffic carried at present by the Hudson tunnel, but that it might be a dismal failure if applied to the serious congestion which makes the superb operation of the New York subway so difficult to maintain. It would undoubtedly be an advantage if women could be spared undue crowding, but a transportation company is under the necessity first of providing service for the majority of its patrons, and in a city as crowded as New York the real problem arises from the fundamental urgent need of keeping the traffic moving.

Fare Increase in Schenectady

The action of the Schenectady Railway in discontinuing the sale of six tickets for 25 cents on its city lines, maintaining the cash fare of 5 cents, is an important movement designed to produce a larger revenue from existing urban passenger traffic. As stated in previous issues of the ELECTRIC RAILWAY JOURNAL, the company filed new tariffs of passenger rates with the New York Public Service Commission, Second District, and, after a complaint regarding them had been filed by citizens of Schenectady, a formal answer was made to the commission. An official explanation of this change in the rate of fare, made by Edward F. Peck, general manager of the company, states that the officials have not been satisfied with the earnings of the road for some time. Without any allowance for depreciation, the company earned in 1908 less than 2 per cent on its investment, and the increase in fixed charges and in taxes had made impossible, with prevailing rates of fare, an adequate return on the capital invested in the property. Mr. Peck added that during the last year every possible economy had been instituted to reduce operating expenses, but the result had been disappointing, and the management had been forced to take steps to increase the revenue of the company. The 5-cent cash fare became effective on March 1. The significance of the statement made by Mr. Peck regarding the inability of the company to earn 2 per cent on the investment last year, when no provision was made for depreciation, will be

better understood when it is remembered that the classification of operating expenses prescribed for street railroad corporations by the Public Service Commission contains accounts covering depreciation of equipment and of way and structures. These accounts must be followed by the railways, in compliance with the order of the commission, beginning July 1, 1909. Since the introduction of the depreciation accounts will add another element to operating expenses, it is evident that with the greater requirements, arising from the introduction of the new system of accounts, the revenues in 1909, if there were no improvement over 1908, would be farther from adequate than they were last year. The movement instituted by the Schenectady company follows the advances in fares made by various Massachusetts lines. The tendency clearly defined throughout the country, but more marked in the East, is toward a higher level of fares.

Advertising and the Engineering Department

This is the era of publicity, and many corporations, even the most conservative, are announcing their plans and making public news of their affairs and purposes to an extent never before experienced. In the adoption of this new policy public service companies, including electric railway companies, have been particularly prominent, and it is interesting to note that in many cases announcements of proposed improvements include engineering data and drawings to elucidate to the lay mind the benefits to be derived from the changes proposed. This is illustrated, for instance, in a recent advertisement published in the daily papers by the Boston Elevated Railway Company for the purpose of acquainting the public with the advantages of the modified plans of the present Dudley Street station of the elevated division in connection with the extension of the train service to Forest Hills. A reproduction was given of the engineering department's plan and elevation of the modified station, showing the arrangement of tracks, platforms, passageways and waiting rooms, with a tabulated statement of the advantages of the plan and a note of the single disadvantage which the layout entailed, as the price of the improvement. The company pointed out the separation of the entering and leaving passengers, the new platforms and extensions of the old platforms made available, the trebling of the present platform area, train and surface car accommodations, facility of transfer, protection of passengers from the weather, and avoidance of congestion—all made possible by the plan. Another example of the policy to which we refer was the carefully executed but simplified drawing of the proposed station improvements of the New York Central Railroad, issued to the press while Mr. Wilgus was vice-president of that company in charge of this work.

By utilizing its engineering plans in this way, a company enables the public to study any proposed arrangement in the fullest detail and thus creates a favorable sentiment and sound understanding of the situation. Such a method, of course, is intended for the more intelligent readers among the public, but to them it appeals more strongly than a written description of the proposed improvement, and the thinking element in the community is, after all, that which a company is most anxious to reach. There is undoubtedly room in other cases for the application of similar means of instruction through the co-operation of the engineering and advertising departments of electric railways.

Detriment to the Public in Franchise Controversy

Albion E. Lang, president of the Toledo Railways & Light Company, in an interesting address before the Toledo Transportation Club, on March 20, considered the detriment to the public interests inevitable when the date of expiration of the limited franchise of a public utility company approaches. Mr. Lang recognizes the condition that, under the Ohio laws, no street railway franchise can be authorized for a period exceeding 25 years, but assumed that the laws provide a way for the renewal of the franchise and that reliance can be placed upon the public intent to deal fairly with the company under these conditions. Any other policy would be detrimental to the reputation of the community for fair dealing, and difficulty will always arise when subsequent attempts to secure funds for development are made by the community affected. States in the Far West have suffered for years and will continue for a long time to feel the effects of their failure in the past to give adequate protection to capital which was lured from financial centers and invested in the development of facilities that contributed to the advantage, health and comfort of the community.

The situation in Toledo, as presented by Mr. Lang, is that of 69 miles of streets occupied by the railways of the company, the right to use 20 per cent expires in about two years and the remainder in subsequent years. The near terminations of grants "enable the capitalists advancing money for the construction" of roads to "exact high rates of interest and heavy discounts." No developing community of size and importance should tolerate a state of affairs which makes impossible the upbuilding of its public utilities with capital borrowed at reasonable rates. It is desirable in the highest degree that the financing of public utility corporations shall be conducted on a basis that will maintain the integrity of their capital investment and secure a reasonable return thereon.

An effort was made a few years ago to secure an extension of franchises by those who formerly controlled the company represented by Mr. Lang, but the failure to agree upon an ordinance "had been so thoroughly advertised throughout the country that the impression prevails in the minds of capitalists and financiers that the city declines to treat this great industry fairly," and "insists upon conditions quite impossible for the company to assume." While capitalists will withhold funds from investment, in the opinion of Mr. Lang, until agreement is reached upon an ordinance fair to the city and the public, it was made clear in the address that an early and speedy decision regarding the franchise question would stimulate rapid advancement of the commercial, manufacturing and industrial growth of Toledo. As that city, with its natural advantages and other facilities, needs industries, and is seeking to induce capital to increase its manufacturing interests, the removal of the street railway problem from its central position as an element of controversy would be desirable and for the good of the city.

Taking up the history of the Toledo system, it was shown that in 1881, when Mr. Lang became interested in the urban railway properties of the city, seven independent street railway corporations were in operation. No double track existed then, except at switches, and the maximum ride possible for a single fare was 3.75 miles. In the intervening years transfer privileges have been inaugurated and extended from time to time until there is possible today a ride of 12 miles for one fare. Combined ownership and control have been, therefore, of decided benefit to the entire community.

After showing that the business of the combined property had been practically at a standstill for the last five or six years, because of the threat of expiring franchises, Mr. Lang proceeded to outline the improvements which were needed, the cost of which is estimated, as the result of a recent exhaustive examination, at above $3,000,000. These include the reconstruction of many miles of track, the construction of several miles of double tracks, the purchase of additional cars and a large interurban station in a central location.

To deny that these important improvements would be of benefit to the citizens, taxpayers and traveling public would be to question the advantage of progress in the service that can be rendered by public utilities if they are allowed fair remuneration for their efforts. It will be in the interest of Toledo if it arranges a fair settlement and avoids the long-continued and distressing conflict on this subject which is part of the history of Chicago and Cleveland.

Smoke Prevention and Electrification

The elimination of smoke from locomotives is one of the arguments which is usually cited in favor of terminal electrification of steam railways. The agitation against the smoke nuisance in Chicago practically forced the Illinois Central to the determination to change its terminal and suburban district to electric operation, and in the New York and Baltimore entrance tunnels the total elimination of smoke was the controlling motive for the change. Elsewhere the conditions may not be so imperative against its abolition, but smoke-producing locomotives are not popular in any community and the steam railroads are keenly alive to the importance of smoke reduction. This is evidenced by a paper recently prepared by A. W. Gibbs, general superintendent of motive power of the Pennsylvania Railroad, at the request of the American Civic Federation.

Mr. Gibbs first points out the great difficulty of controlling the emission of smoke from a locomotive in which the boiler is fired far beyond the maximum of stationary boiler practice and is subject to sudden and violent fluctuations of load. He then discusses four possible methods of reducing the smoke, namely: (1) Use of smokeless fuel; (2) use of devices which assist in creating more perfect combustion; (3) education of the men operating locomotives and careful and constant supervision of their work; (4) conversion to electric traction. After considering the merits of each, he concludes that thorough instruction in methods of firing coal and operating the locomotives, followed by systematic supervision and discipline for violation of instructions constitutes the best method of smoke prevention.

Mr. Gibbs expresses doubt about the immediate possibilities of electrification because of its enormous cost and meager return on the investment, and also because of the unsettled state of the art of heavy electric traction. Among the objections raised are that the cost of electric apparatus is very large, the charge for electric locomotives, for example, being twice as much as steam locomotives; that the cost of operation is increased; that both the overhead conductor and third-rail systems present serious difficulties from an operating standpoint; that the change from electric to steam locomotives on through trains at the end of the terminal district involves excessive delays and introduces difficulties in heating trains by steam, and, finally, that electric locomotives are still in the experimental stage. He concludes with the assertion that capital diverted toward electrification could be employed far more usefully in other directions.

Some of the author's objections are valid; others are generalizations so broad as to be open to argument. It is true that electrification is expensive; nevertheless in many cases it is possible to earn a fair return on the additional investment required. A study of the problem as relating to one of the railroads entering New York which handles a large suburban traffic as well as considerable through freight and passengers showed a probable return of between 7 per cent and 10 per cent on the additional investment. This was after very liberal allowances had been made for all contingencies and maintenance provided for. The Southern Pacific electrification of its Sierra Nevada mountain division is to be undertaken instead of double-tracking the road in order to increase the carrying capacity of the single line of rails. The cost will be great, but the return is expected to justify the outlay. Other similar instances might be quoted. Although many have freely criticized both overhead and third-rail conductors, the New Haven with the former system and the New York Central with the latter are operating without any serious difficulty. Each is apparently satisfied with its own system. The change of locomotives at the end of the electric zone also is being accomplished by both roads without serious delays.

The design of high-speed electric locomotives is yet far from being wholly satisfactory, as Mr. Gibbs says. Nevertheless, the experimental work done by the locomotive builders and the experience gained through the operation of the locomotives of the New York Central, the New Haven and the Grand Trunk is fast clearing up some of the unsettled points. The author remarks that the multiple-unit system has been worked out fairly well—a significant statement, in view of the fact that the Pennsylvania electrification so far has been only with this type of equipment. This is an encouraging sign, as we pointed out in discussing this subject in these columns a few weeks ago. We trust that after electric locomotives have been put in service hauling Pennsylvania trains in and out of New York, Mr. Gibbs will find it possible to speak equally as well of them as the New Haven and New York Central engineers have done in the many discussions on heavy electric traction during the last two years.

THE CHICAGO, LAKE SHORE & SOUTH BEND RAILWAY

One of the most important single-phase installations now operating in the United States is the Chicago, Lake Shore & South Bend Railway, extending from South Bend, Ind., to Pullman, Ill., a distance of 77.5 miles. This new road furnishes direct communication in connection with the Illinois Central Railroad suburban service, between Chicago, Pullman, Kensington, Hammond, East Chicago, Indiana Harbor, Gary, Michigan City and South Bend. The territory around the south shore of Lake Michigan has recently shown such a remarkable growth in its industries and population that it evidently will afford traffic to support a line built in the most modern manner.

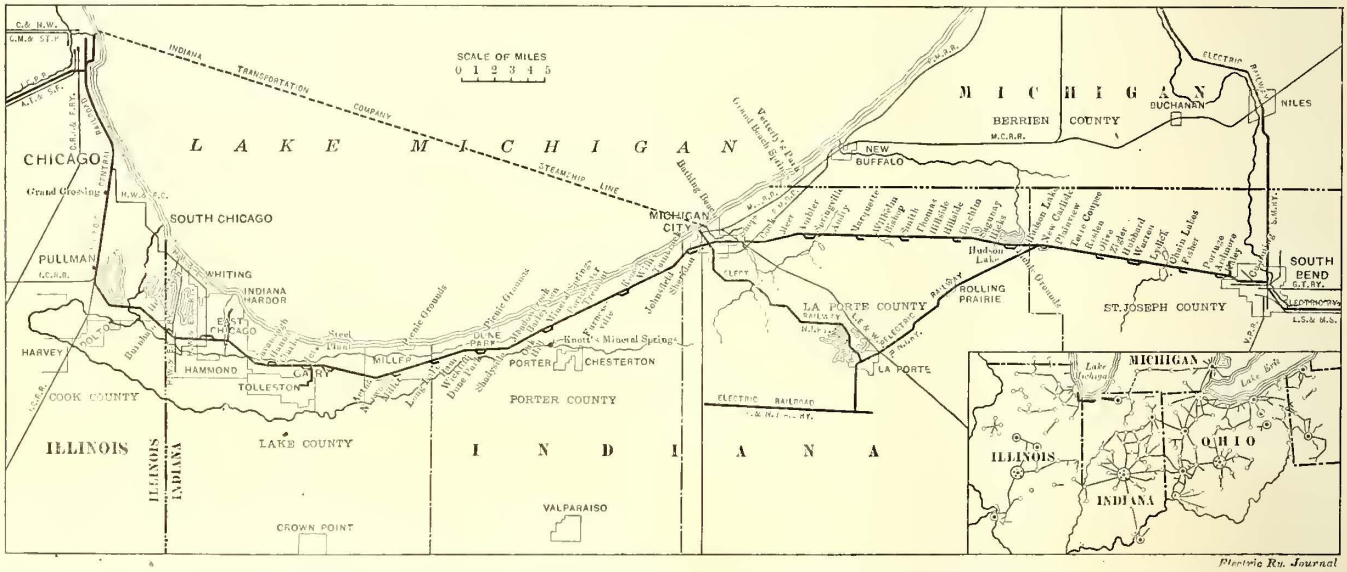
Several years ago a syndicate of Cleveland capitalists, recognizing the value of a road through this territory, obtained franchises and grants of especial value, including private rights of way through the new town of Gary. The Illinois Central Railroad Company agreed also to construct and equip that portion of the new line in Illinois and give the electric road the exclusive use of this track from Hammond to Pullman, Ill., at which point the electric line joins the Illinois Central suburban system.

chise in South Bend and private right of way within the city limits. In nine minutes after leaving South Bend terminal the cars can reach a point on the private right of way where a car can be run safely at high speed.

The western terminus is at Pullman, Ill., where, for the present, passengers will transfer from and to the suburban trains of the Illinois Central Railroad, which run at intervals of 40 minutes to and from the heart of Chicago. An overhead footbridge has been constructed here for the convenience of the public, connecting the interurban platform with the suburban platform of the Illinois Central Railroad and permitting joint use of the depot at Pullman The train schedules are arranged so that cars of the new road make close connections with the Illinois Central suburban trains, offering quick and convenient service to the downtown district of Chicago at the Randolph and Van Buren Street stations of the steam road.

ROADBED AND TRACK

The roadbed has been constructed according to modern steam railroad practice; a maximum gradient of 2 per cent exists in but one place, which is the approach to a steam railroad crossing. Outside of cities the maximum



Chicago, Lake Shore & South Bend—Map of Route Traversed Between South Bend and Pullman, Showing also Connections with Other Interurban Lines in Northern Indiana and Illinois

The financing of the railway was undertaken and completed by Cleveland capitalists representing several of the leading trust companies in that city. A syndicate management was formed, with M. H. Wilson, vice-president of the Cleveland Trust Company, as the head. During the recent financial depression, when nearly all railway construction was either greatly restricted or entirely suspended, the work on this line was carried forward without delay, and all obligations were taken care of promptly.

The construction of the roadbed, inclusive of bridges, was done by a construction company organized for the purpose. The construction of the electrical distribution system, power house equipment and buildings was supervised by the Cleveland Construction Company, of Cleveland, Ohio, as consulting engineer. After careful examination of the different methods available for operation of the new line, the engineers recommended the use of the single-phase distribution system, which was adopted.

ROUTE

The eastern terminus is in the center of South Bend, Ind., directly in front of the Oliver Hotel, near the City Hall and Court House. The company owns a street fran-

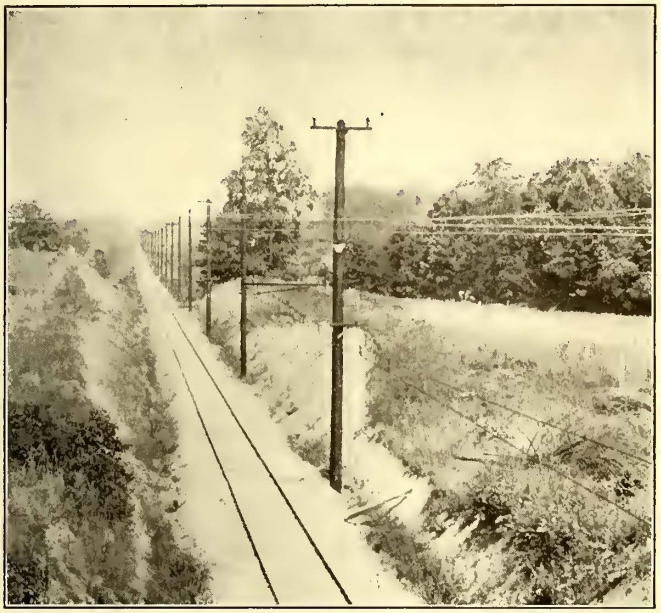
curvature is 3 deg., with the exception of one 6-deg. curve. Tangents of 7, 8 and 14 miles exist, and all track work was designed for safe operation at the high speeds.

The main line track comprises 70-lb., A. S. C. E., 33-ft. rails laid on 6-in. x 8-in. x 8-ft. white oak ties spaced on 24-in. centers. The track in city streets is laid with 80-lb. Shanghai rails in 60-ft. lengths, with steel rail braces placed every 10 ft. All special track work is arranged for the standard M. C. B. flange and tread. Standard steam road spring frogs are used throughout. The switchstands are of the semaphore type, equipped with long-burning oil lamps with red and green lenses. At all crossings with main line steam tracks the grades are separated, except in cities, where derailers are installed. A grade crossing with the Chicago Outer Belt Line Railroad near East Chicago is protected by an interlocking plant, with a signal tower.

All bridges over other railways are of steel designed for Cooper's E-50 loading. Highway bridges are of reinforced concrete. There is but one section of pile trestle on the property, and this comprises the approaches to the Calumet River bridge. This wood trestle will be partly filled with sand and partly replaced by a steel viaduct.

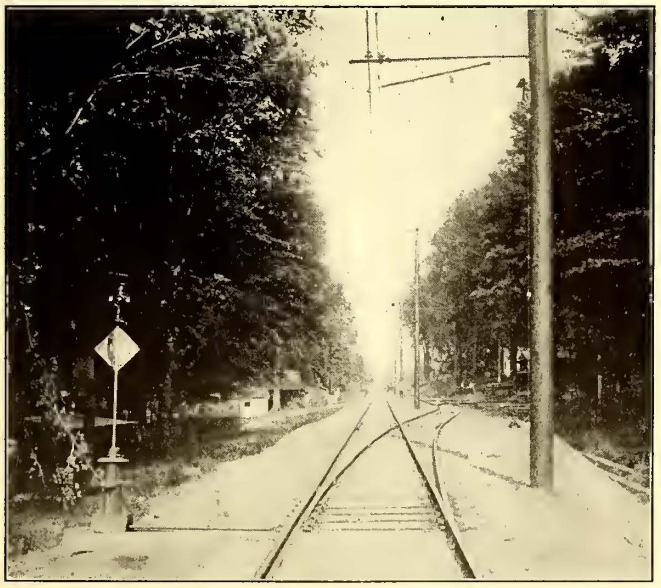
Large culverts and cattle passes are of reinforced concrete. A minimum clearance of 17 ft. 6 in. above the rail is maintained under all structures over the track, to allow for catenary construction and the use of a pantograph.

The rail bonds outside of cities are No. 0000 copper, with ⅞-in. solid terminals placed under the base of the rails.



Chicago, Lake Shore & South Bend—A Long Tangent

The holes for the terminals were made with hydraulic punches which left cone-shaped openings with their larger diameter at the top. The bonds were inserted from underneath and the terminals expanded into place with hydraulic compressors at a pressure of about 15 tons per square inch. After four months of use by heavy ballast trains and 70-ton locomotives operating over the unballasted track not one loose terminal has been found, al-



Chicago, Lake Shore & South Bend—Siding and Standard Switchstand

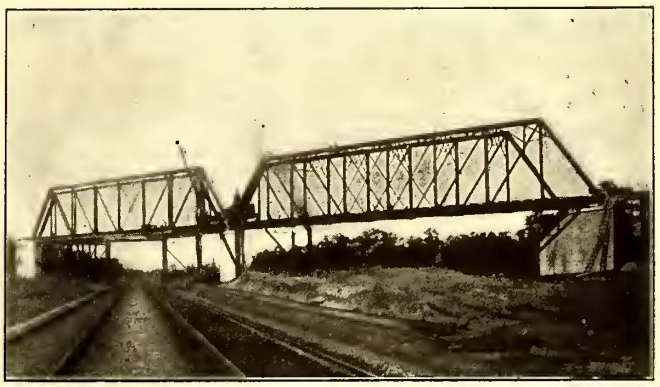
though a considerable number of bonds have been broken by the excessive movement of the loose joints.

No. 0000 cross-bonds were spaced 700 ft. apart. On account of the industry of copper thieves it was found impossible to maintain these bonds in the vicinity of Gary, and now it is proposed to replace the stolen bonds with heavy iron bars extending between the rails and connected to both by the ordinary rail bonds. The incentive for theft will thus be reduced to a minimum. All special work is shunted by two No. 0000 wires attached to cross-bonds at each end.

TRANSMISSION LINE

All the power for the operation of the entire road and the shops is generated in the Michigan City power station, which will be described in a later article. The trolley wire is fed near the station at the generating pressure of 6600 volts and the ends are also fed by two step-down transformer stations located respectively 24 miles east and west of Michigan City. The transmission voltage is 33,000 and the single-phase high-tension circuit from Michigan City to each of the two substations mentioned is carried on the tops of the same poles which support the trolley brackets. The pole line is exceptionally substantial. It is constructed of 45-ft. creosoted Southern pine poles with 9-in. tops. Each pole is set 6 ft. in the ground. Into each hole two barrels of concrete were placed, equally divided and tamped firmly at the top and bottom of the hole to afford a secure bracing.

One of the engravings shows the details of a pole top of standard design. Stranded aluminum conductors of No. 2 copper equivalent are used for high-voltage circuits. The two wires are spaced 65 in. apart at the ends of a 4-in. x



Chicago, Lake Shore & South Bend—Through Truss Bridge Crossing Tracks of the Pennsylvania Lines West and the Wabash

5-in. creosoted cross-arm. In place of cross-arm braces of iron, triangular blocks or gussets were spiked to the poles under the high-tension cross-arms, and to prevent the tearing of the wood the usual lag-screw fastenings were replaced by galvanized hinged spikes with wedge-shaped points specially made by the American Steel & Wire Company.

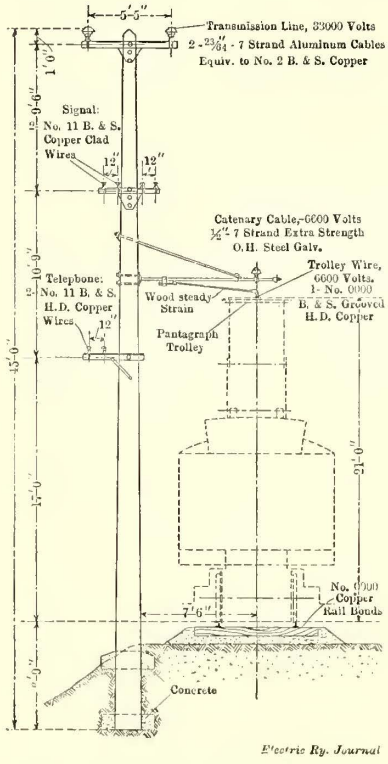
The insulators on the transmission system are 33,000-volt porcelain, spray tested to 80,000 volts, and were supplied by the Ohio Brass Company. They are supported on special wooden pins impregnated by the vacuum process with a bituminous compound similar to that used for insulating railway motor fields. The transmission line as here described is about 50 miles long.

TROLLEY LINE CONSTRUCTION

A trolley voltage of 6600 is used throughout. Arrangements are made so that in East Chicago, Indiana Harbor, Michigan City and South Bend, where it may be necessary to work on the trolley wire, it can be fed with 700-volt current distributed through single-phase transformers. The shop and yards are normally supplied with 700-volt current. No direct current is used in the trolley system. This use of alternating current only is important since it

entirely avoids the complication of control apparaus required where car equipments must be operated on both direct and alternating trolley currents.

The trolley wire throughout is No. 0000 GE grooved section, supported by a ½-in. extra-strength double-galvanized catenary cable, except in city streets, where span construction is used. Special care was taken in the specifications for the catenary cable to insure high strength and proper galvanizing. The cable has an 18-in. sag between supports, which are 166 ft. apart on tangents and closer on curves in proportion to the rate of curvature. The trolley hangers are rods of ⅝-in. galvanized round iron with sister hooks at the top. They are spaced 12 ft. apart. A wedge clamp serves to secure the trolley wire to the hangers. The overhead fittings were supplied by the Ohio Brass Company.



Chicago, Lake Shore & South Bend—Standard Track and Trolley Construction

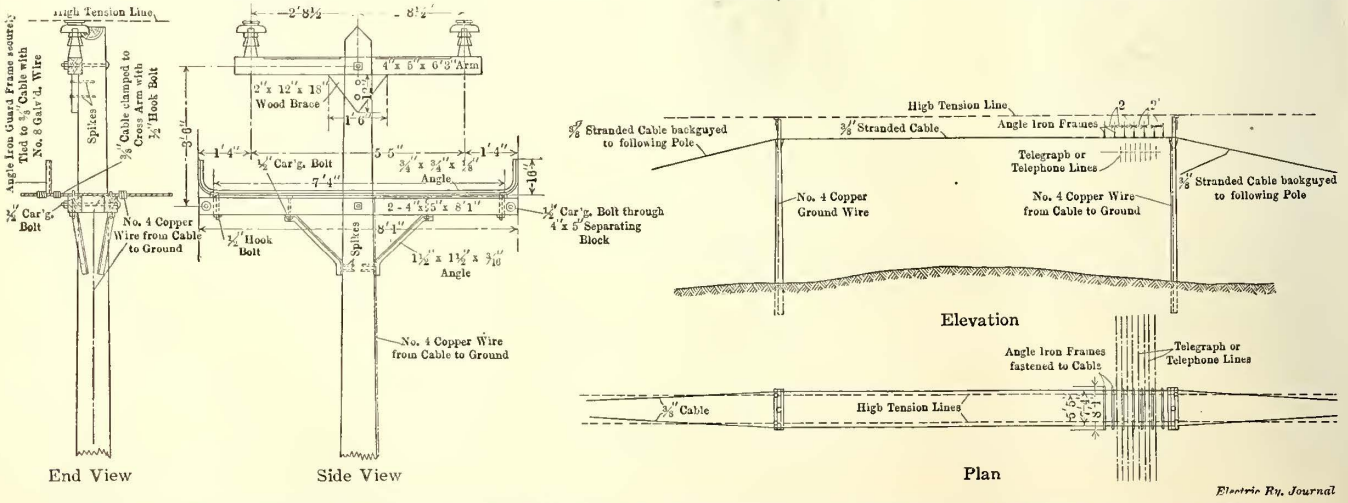
The catenary cable is supported on porcelain insulators tested to 20,000 volts, attached to T-iron pole brackets 9 ft. long with ⅝-in. overtruss rods. The trolley is further supported transversely by wood steady strains placed at every second pole on tangents and every pole on curves. When the catenary insulators were screwed to the iron bracket pins the pins were first wrapped with rubber tape. This affords some elasticity between the porcelain and the metal and has prevented a breakage of insulators which has been serious in several other installations. During four months of operation not one trolley or high-tension insulator has broken down in service.

The trolley and catenary cable are anchored at both ends of every curve and at 1-mile intervals between curves. An extra pole is set for each anchorage and the trolley and messenger are held against movement in either direction, thus preventing the falling of a length of wire in case of breakage. The catenary cable is anchored on each side of all overhead structures and the section between anchors carries no current.

To obtain an even deflection on curves 14-in. Detroit type trolley clamps are used. The trolley splices are of cold-drawn copper tubing 36 in. long soldered the entire length. To permit satisfactory operation of the pantagraph collectors at the very high speed desired (max. 75 m.p.h.) it was found necessary to maintain the trolley exceedingly taut and the original splices, 24 in. long, pulled out about as fast as they could be put in. It was found necessary to pull up the line with a dynamometer so that the messenger and the trolley wire had the correct and uniform tension.

The trolley wire is sectioned about every 10 miles by a high-tension insulator with impregnated wood for insulation. Each breaker has a grounded brass band encircling the center of its insulation. This feature is of especial value at junction points of high and low voltage sections, because it assures safety from high voltage to any one working on the low-tension section. As the trolley and messenger are of the same potential porcelain spool section breaks are also installed in the catenary cable directly over the trolley section insulators. From either side of such a section-break a No. 0000 wire is run to a disconnecting switch on the pole opposite. Under ordinary operating conditions these switches remain closed, but in case of line trouble any switch can be opened by the dispatcher at Michigan City. The standard semaphore operating equipment of the Telegraph Signal Company is used for this purpose.

In cities where a span wire suspension is used the construction is of standard type with heavy fittings. Steel poles are used in the downtown district in South Bend and high-tension porcelain strain insulators are used in spans and guys next the poles. Because of the excessive drop in both rail and overhead conductor within the cities when a potential of only 700 volts is used the length of the trolley sections is limited to about a mile. Transformers in fireproof stations are spaced accordingly and are fed from the 6600-volt trolley which is carried past each low-tension section on the poles at one side. Each section of No. 0000 trolley, which is arranged so that high or low voltage may be used, is supplemented by two No. 0000 stranded feeder

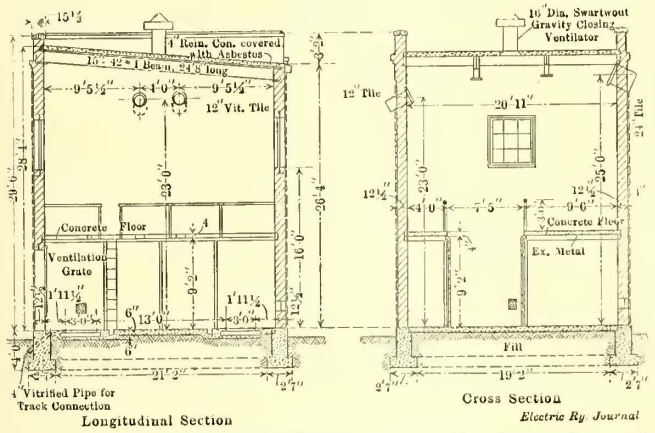


Chicago, Lake Shore & South Bend—Details of Standard Catenary Trolley and High Tension Pole Line

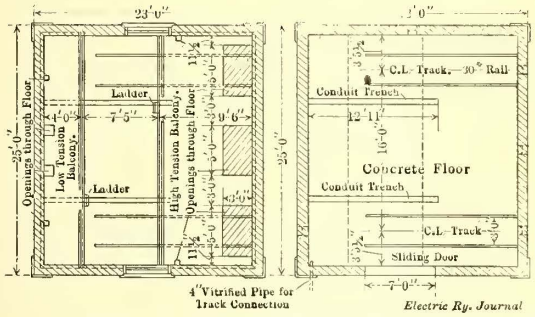
cables, which parallel the trolley for substantially its entire length.

SUBSTATIONS

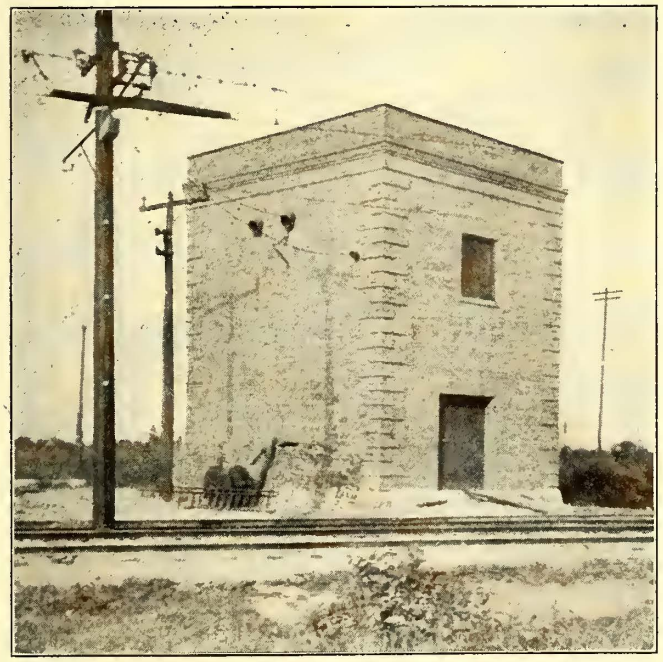
There are nine substations, two at the terminals of the 33,000-volt line, reducing to 6600 volts to supply the outer



Chicago, Lake Shore & South Bend—Sections Through Static Transformer Substation Building



Chicago, Lake Shore & South Bend—Plans of Upper and Lower Floors of Static Transformer Substation Building



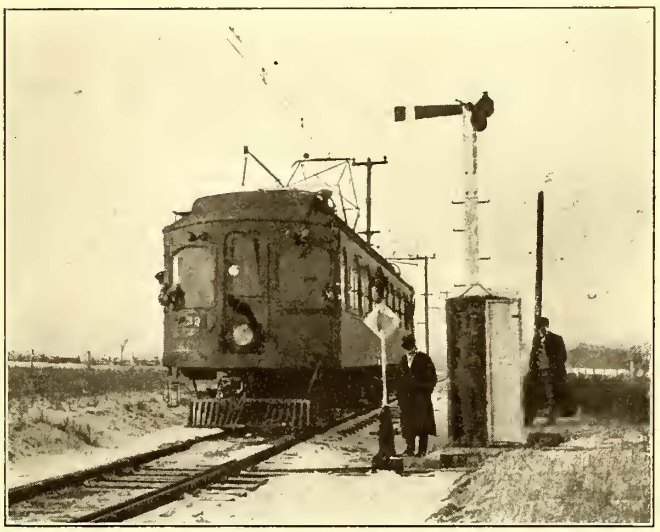
Chicago, Lake Shore & South Bend—Static Transformer Substation

ends of the road, and eight available for supplying low-tension sections in towns if desired and at the car shops near Michigan City. The latter are connected between the trolley wire and track on both primary and secondary sides.

The larger high-tension substation at East Chicago contains three 500-kw oil-insulated self-cooling single-phase transformers and the smaller, at Terre Coupee, contains two of the same units with room for a third. In these large substations the 6600-volt circuits have oil switches, but the 33,000-volt switches are the Westinghouse stick type using enclosed expulsion fuses.

The low-tension substations are located as follows: Three in East Chicago to supply 2 miles of main-line and 2 miles of branch-line trolley; two in Michigan City to supply 2.25 miles of main-line trolley; two in South Bend to supply 2 miles of main track and one at the car shops. All the low-tension substations are similar in equipment. That at Michigan City has duplicate equipments in one building. Each installation includes one 200-kw oil-insulated, self-cooling transformer with a stick-type, 6600-volt circuit breaker and low equivalent lightning arrester and an automatic oil circuit breaker in the connections to the low-tension trolley. The latter switch has a time lag which is materially shorter than that of the stick breaker.

It was not practicable to equip the substation buildings with cranes and therefore the following expedients were



Chicago, Lake Shore & South Bend—Dispatcher's Signal and Telephone Booth at Siding

used to assist in handling the transformers: In the high-tension substations the transformers are all set on trucks running on rails in the floor so they can be pulled out under a steel beam in the roof to which a chain hoist can be attached and any transformer lifted from its case. In the low-tension substations the track was not thought necessary, but each transformer was set on a concrete pedestal with a similar steel beam overhead so that the working part can be lifted out of the case and lowered to the floor. All the substation transformers are set high enough above the floor so that a standard oil tank can be rolled under the oil outlet when it is desired to drain the case.

The stick-type circuit breakers with enclosed fuses were adopted for the substation primary circuits because no substation attendance was expected; such breakers when seldom operated are less likely to get out of order than oil switches. The heavy time lag is also desirable so that the generating station breakers may have every chance to open first on an overload.

The substation buildings are simple fireproof structures. Accompanying engravings illustrate their general dimensions and design. During the past summer while the transformers were being dried out the trolley line 75 miles long

was fed at its midpoint and the cars were satisfactorily operated over its entire length without using the transformer stations.

TELEPHONE LINE

There is one telephone circuit throughout the length of the line and a duplicate from Gary to Pullman, 17 miles.

Chicago, Lake Shore & South Bend—Interior of Passenger Car

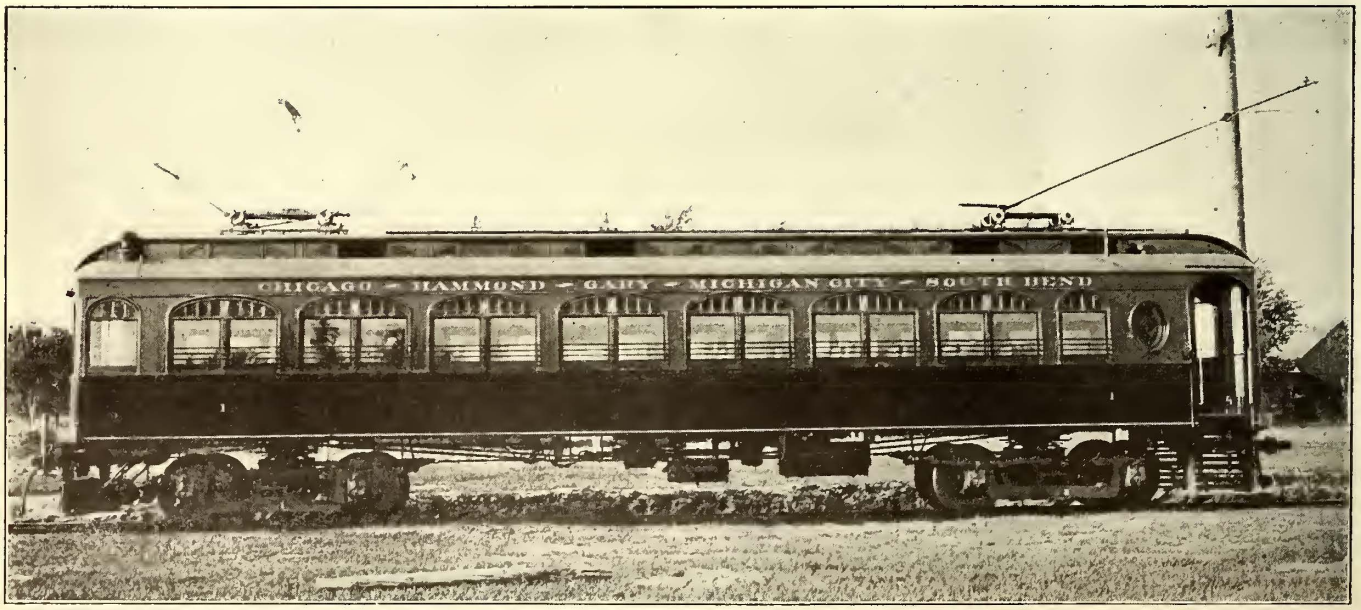
Each circuit consists of a pair of No. 11 copper-clad steel wires supplied by the Duplex Metals Company. The telephone circuit is half spiraled every second pole with vertical double insulator brackets. Owing to the fact that the telephone line is on the same poles with the 33,000-volt transmission line and also with the 6600-volt trolley, extreme care was exercised in its construction. In addition to the transpositions a 1-to-1 ratio transformer, insulated for 30,000 volts and with a grounded core, was installed for each telephone. These transformers perform two valuable functions: They eliminate substantially all of the noise due to induction and leakage and also protect the telephone instruments from high-tension current. It is said that it is possible to cross one of the telephone wires with the 6600-volt trolley wire and still maintain ordinary conversation.

In South Bend, owing to the obstruction of trees along the line, arrangements have been made with one of the local telephone companies to support the two railway wires through the city to the ticket office on the telephone company's poles. A transformer similar to those mentioned above was installed at the city limits, thus protecting all the local wires in case of a cross or ground.

Telephone booths of sheet steel are placed at each siding and at important stops. These booths contain a telephone instrument, block signal apparatus, described later, and an Egry autographic register for trainmen's use in taking and recording orders. All wires are brought into the booths under the tracks in steel conduit and a switch is located in the booth interlocking with the door. When entering the booth a party desiring to use the telephone must first close this switch and again he must open the switch as he leaves or the door of the booth cannot be closed. All booth telephones are without ringers and current is taken from the lighting system of the office building at Michigan City to operate the dispatcher's ringer. The switchboard at the dispatcher's office has provisions for extra lines and is connected to the long-distance Bell lines.

SIGNAL SYSTEM

To assist the dispatcher in handling trains with the telephone the Telegraph Signal Company's system, made by the Stromberg-Carlson Telephone Manufacturing Company, of Rochester, N. Y., was installed. A system of synchronous clocks, one located at each meeting point, and a master clock in the dispatcher's office, control the semaphore blades along the road. Any one of these boards may be thrown by the dispatcher. The semaphores indicate stop by a horizontal position of the arm by day and a red light by night in the usual manner. When a car is blocked by a semaphore the conductor proceeds to the 'phone, obtains his order by the Egry register system and upon receiving an order from the dispatcher sets the signal again to safety by pulling down a lever within the booth.



Chicago, Lake Shore & South Bend—Standard Motor Passenger Car

The clocks are operated by weights and require winding about once in 30 days. The signal circuit consists of two hard-drawn copper wires. This installation has given full satisfaction.

CARS AND EQUIPMENT

The rolling-stock equipment includes 24 large passenger cars, one high-powered utility car, four smaller cars for local service, 20 Hart convertible cars, 3 box and 12 flat cars and 1 Russell No. 1 snow plow. The passenger cars were described and illustrated in the ELECTRIC RAILWAY REVIEW for May 23, 1908, page 628. Express cars are now being constructed. The passenger cars were built by the Niles Car & Manufacturing Company.

From the following general dimensions presented it will be noted that the passenger-car bodies are of the regular steam coach width, which is a desirable feature that few interurban railways have been able to obtain.

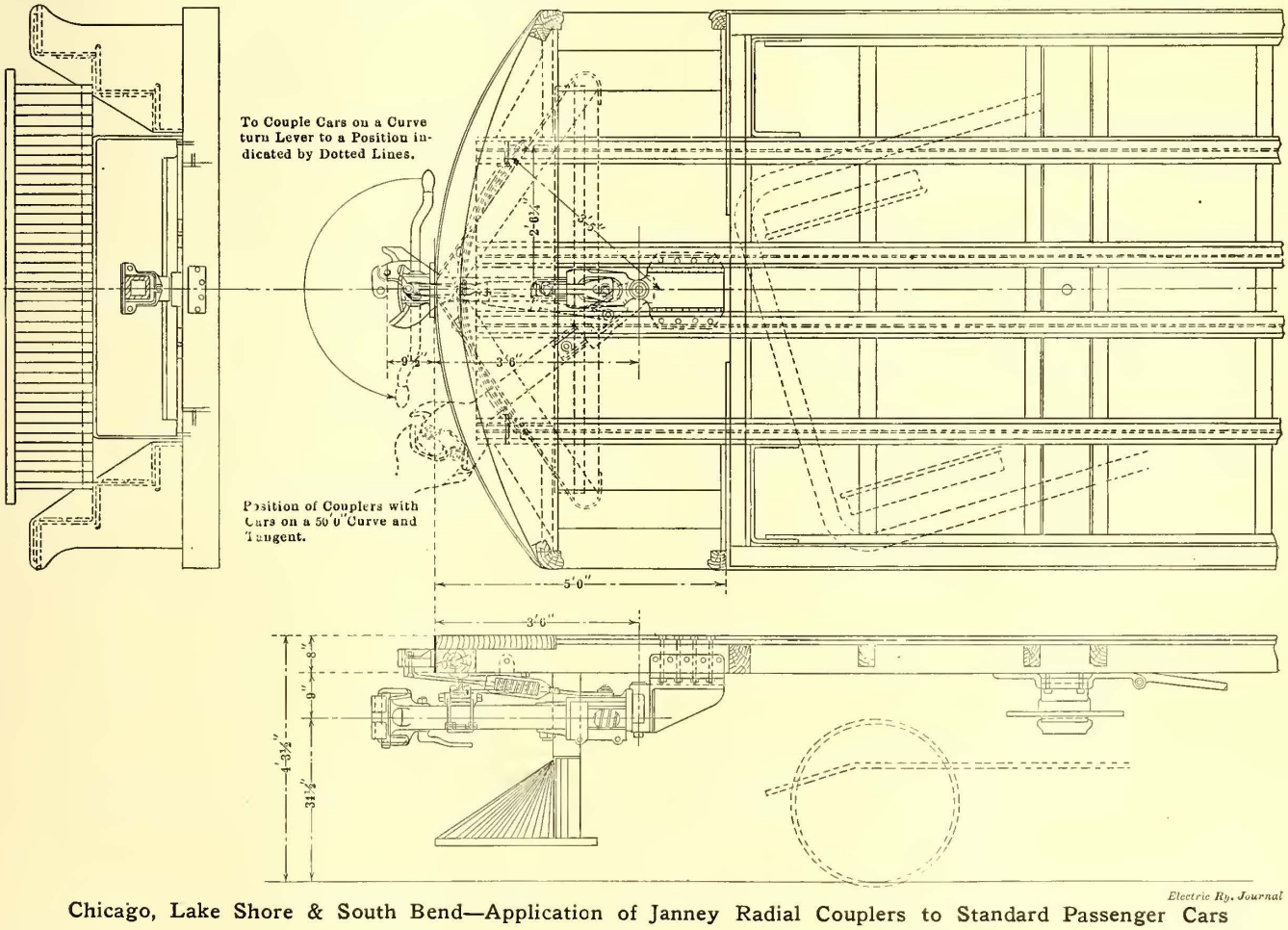
Length over all	57 ft.	2 in.
Length over body	47 ft.	4 in.
Width over all	10 ft.	
Height from floor to top of roof	9 ft.	5 in.
Truck centers	35 ft.	6 in.
Width of aisle		24 in.
Width inside	9 ft.	7½ in.

The underframing of the passenger cars is of semi-steel construction with double outside sills that have ⅝-in. x 10-in. steel plates bolted between them. The four center and intermediate sills are 6-in. I-beams and extend the full length of the car from buffer to buffer. End doors in the vestibules with spring buffer platforms are provided so that passengers may pass from car to car. Over the vestibule step openings are self-opening trap doors manufactured by the O. M. Edwards Company.

The interiors of the car bodies are richly finished in polished dark mahogany. The ceilings are full Empire style, artistically decorated and illuminated with incandescent lamps enclosed in Holophane bowls. An individual lamp is also supported over each seat by an artistic bronze bracket. The passenger cars have a seating capacity for 60 persons; the seats, manufactured by Hale & Kilburn, have stationary backs, foot rests, bronze grab and offset handles and arm rests and are upholstered in leather. The cushions are 38-in. long and the seats measure 48 in. from the inside of the car to the outside of the arm rests. A toilet room is located at the rear of the main passenger compartment.

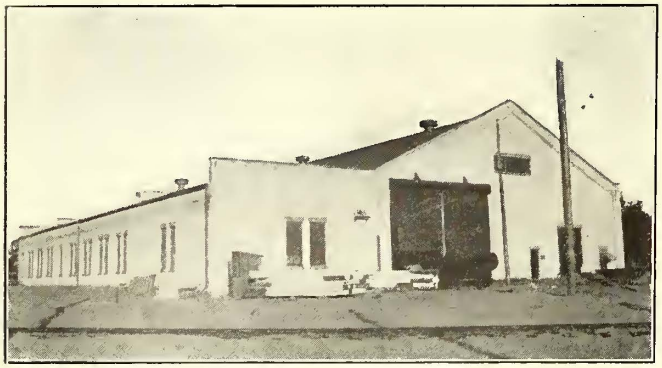
These cars are mounted on Baldwin Locomotive Works,

Chicago, Lake Shore & South Bend—Russell Snow Plow Pushed by Standard Passenger Car



Chicago, Lake Shore & South Bend—Application of Janney Radial Couplers to Standard Passenger Cars

Class 90-35 M. C. B. trucks with 7-ft. 6-in. wheel base. Each truck was designed for a working center plate load of 35,000 lb. Standard Steel Works solid steel wheels, 38 in. in diameter, are mounted on axles 6½ in. in diameter at the center, 7½ in. at the gear seat and 7 in. at the wheel seats. The journals are 5½ in. x 10 in., inclosed in Syming-



Chicago, Lake Shore & South Bend—Repair Shops at Michigan City

ton journal boxes. Ball-bearing center bearings are used on all trucks.

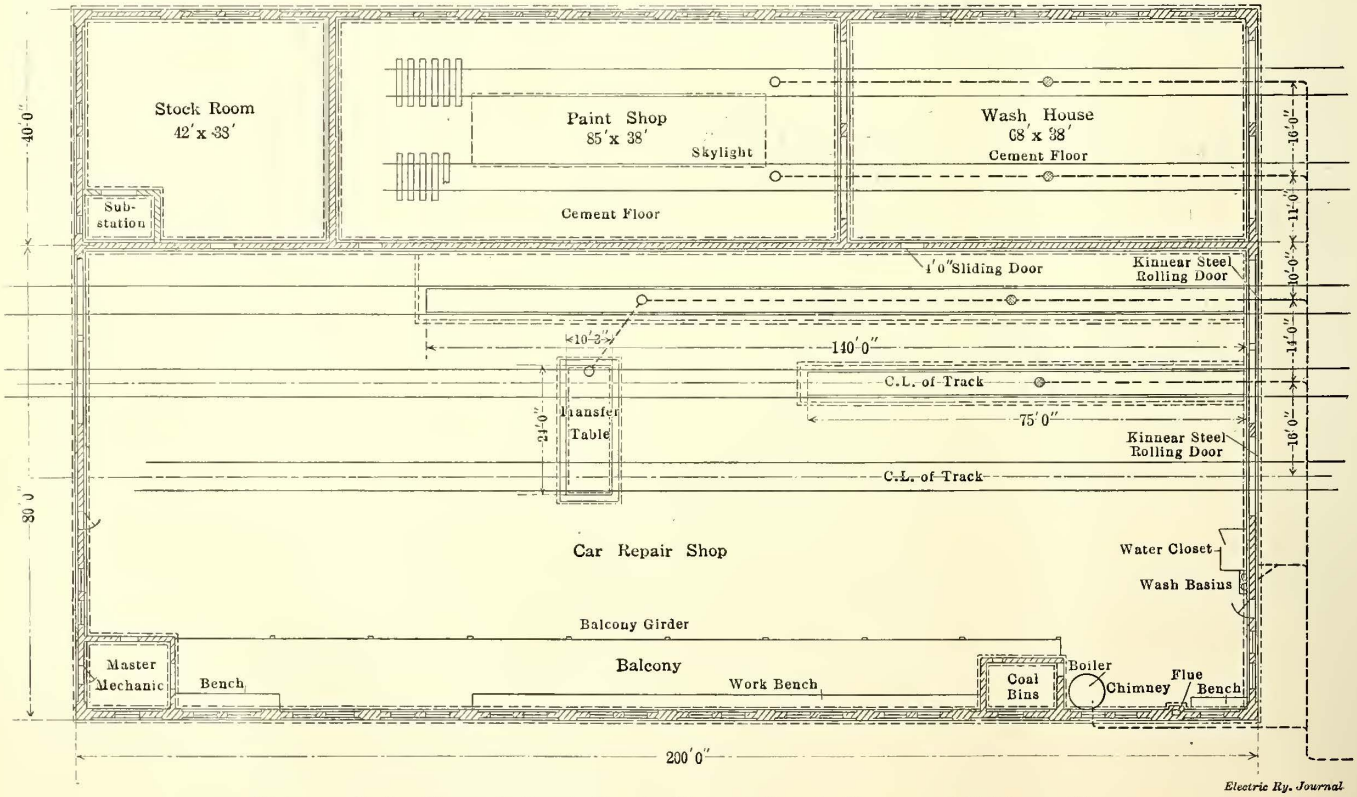
The electrical equipment includes four Westinghouse No. 148 single-phase motors rated at 125-hp capacity each and multiple-unit control. The special equipment of the cars includes Peter Smith hot-water heaters, Westinghouse automatic air brakes, Peacock hand brakes, Lintern markers and classification lights and Knutson trolley retrievers.

All the cars are equipped with Janney radial M.C.B. coupler equipment made by the McConway & Torley Company, of Pittsburg, Pa. The coupler head is the same as that used extensively on the passenger coaches of steam railroads. Wide lateral movement of the coupler is required, owing to the severe curves over which the cars travel, while to automatically hold the coupler in the central position on the car for coupling on straight track, a special centering bar and spring are mounted immediately over and parallel with the drawbar. At the forward end of this centering device is a cam and lever, by means of which the compression can be removed from the centering spring, after which the coupler may be moved to any point required for coupling on curved track. On the side of the coupler head is a horn or bracket made to engage the guard arm of the opposing coupler, its object being to minimize the tendency of the couplers to buckle and to strengthen them in pushing cars around curves.

As security against any electrical injury the roofs of the cars are covered with 16-oz. sheet copper well grounded. The exteriors of the cars are painted in three shades of maroon with silver lettering. This exterior finish is similar to that of the Chicago & Alton limited trains. Each passenger car is provided with two wheel trolleys and a pantograph collector, the latter being used on 6600-volt current only. By means of a change-over switch either trolley can be operated on either voltage as desired.

The utility car is a combination equipment which can be used for a construction locomotive or for hauling freight trains. The underframing of this car is built of heavy steel with continuous sills 40 ft. long. The electrical and braking equipment is similar to that of the passenger cars. This car has been fitted with a box body. Both ends of the body have double doors through which such large pieces of freight as theatrical scenery may be loaded.

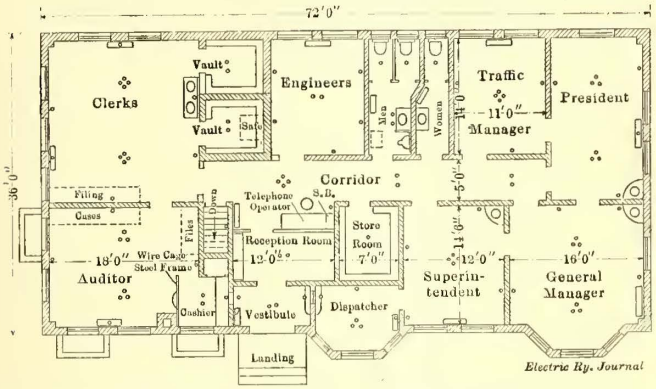
The interurban rolling-stock equipment since the beginning of operation in the summer has given excellent satisfaction. The cars start easily and accelerate with little noise to speeds of more than 60 m.p.h. For 14 miles west of South Bend the electric railway is parallel with and adjacent to the main-line track of the Lake Shore &



Chicago, Lake Shore & South Bend—Plan of Repair Shops at Michigan City

Michigan Southern Railway. Frequent races take place between the steam and the electric equipments and it is said that the electric cars have time and time again outdistanced the steam trains, including the famous Twentieth Century Limited.

The four small cars earlier mentioned are in service in East Chicago and Indiana Harbor on about 4 miles of low-tension line. These cars are 42 ft. long, of the Brill semi-convertible type, and are equipped with Brill and Baldwin trucks. The motor equipment consists of two



Chicago, Lake Shore & South Bend—Floor Plan of General Office Building at Michigan City

75-hp Westinghouse single-phase motors with platform control so arranged that the cars may be operated on the 6600-volt sections.

REPAIR SHOPS

The repair shop of the system is located at East Michigan City and consists of a large building of sand-lime brick with a steel truss roof. It includes a general motor repair shop, armature room, store room, paint shop and wash room, all steam heated and well lighted. Two pits and a transfer table are provided, together with swinging cranes, compressed air and all the necessary tools for car repairs, including a 400-ton wheel press and a wheel-turning lathe. The tools are driven by 30-hp Westinghouse induction motors. Fire protection is provided by a 25,000-gal. tank erected on a 60-ft. tower and a centrifugal pump of 500 gal. per minute capacity, operated by an induction motor installed in a fireproof building 50 ft. distant from the main building. There is also a separate fireproof building adjacent to the shop for storing sand, oil and wrecking tools. The main repair shop presents an unbroken space without columns or partitions.

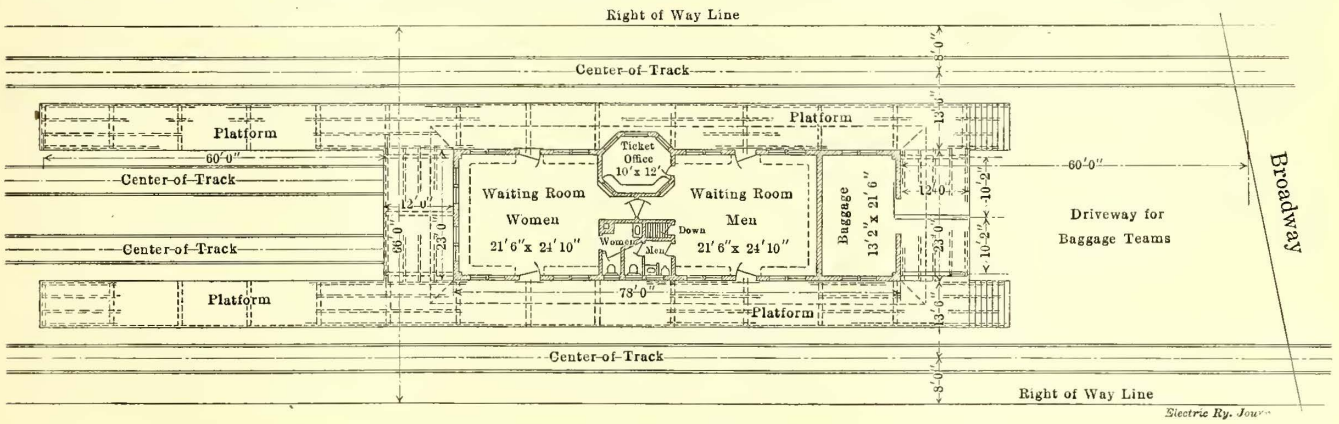
OFFICE AND STATION BUILDINGS

The general offices are also located at East Michigan City, adjacent to the repair shops. The office building is of white brick with red tile roof. It is one story high with a basement and contains offices for the general manager, auditor, electrical engineer, traffic manager, engineers, accountants, cashier, superintendent and train dispatchers, as well as telephone desk room, reception room, general store room, toilets, fireproof vaults, etc. The water supply is provided from the general storage tank for the shops and the lighting from a step-down transformer feeding from the 6600-volt trolley. The office building is splendidly located, being substantially at the center of the system and but 10 minutes' ride by local cars from the business district of Michigan City.

Chicago, Lake Shore & South Bend—General Office Building at Michigan City

At Gary, Ind., is a substantial brick station building 23 ft. x 78 ft., with tile roof, similar in general appearance to the office building previously described. This contains a ticket office, waiting rooms, baggage room, etc. The location is near the plant of the United States Steel Corporation at the head of Broadway and is close to several steam road stations. A 200-ft. platform, level with the car floor, is provided for the use of passengers and the handling of freight and express. It is expected that the business between Gary and Hammond, East Chicago and Chicago will be extremely heavy and a storage yard and "Y" for turning have been provided.

At South Bend a large waiting room and ticket office have been secured on Main Street, close to the Oliver Hotel, opera house, county building, city hall and the terminus of the other traction lines. Arrangements also have been made here for the proper handling of freight and express, for which the company is now making especial preparations.

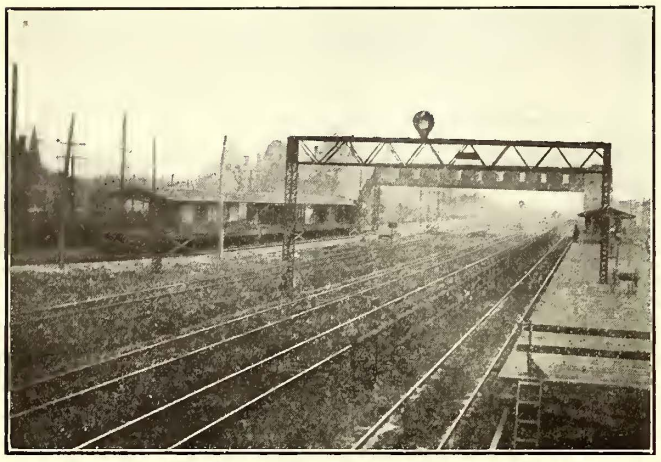


Chicago, Lake Shore & South Bend—Plan of Station and Platform at Gary, Ind.

At Michigan City the depot for the present is located in a store building adjacent to the tracks in the center of the city. The waiting room in this building is 20 ft. x 57

ft. in size and at the rear is a freight and baggage room 20 ft. x 30 ft. Local ticket offices also are being installed in all of the larger cities and towns through which the road passes.

Neat wooden waiting stations and platforms are located at the principal highway crossings and stopping places. The road crossings have been named so that there may be no confusing of numbers. At each road intersection, crossing post or way station is posted a time-table showing when trains are due to stop at that point. These time-



Chicago, Lake Shore & South Bend—Terminal at Kensington on Illinois Central Railroad

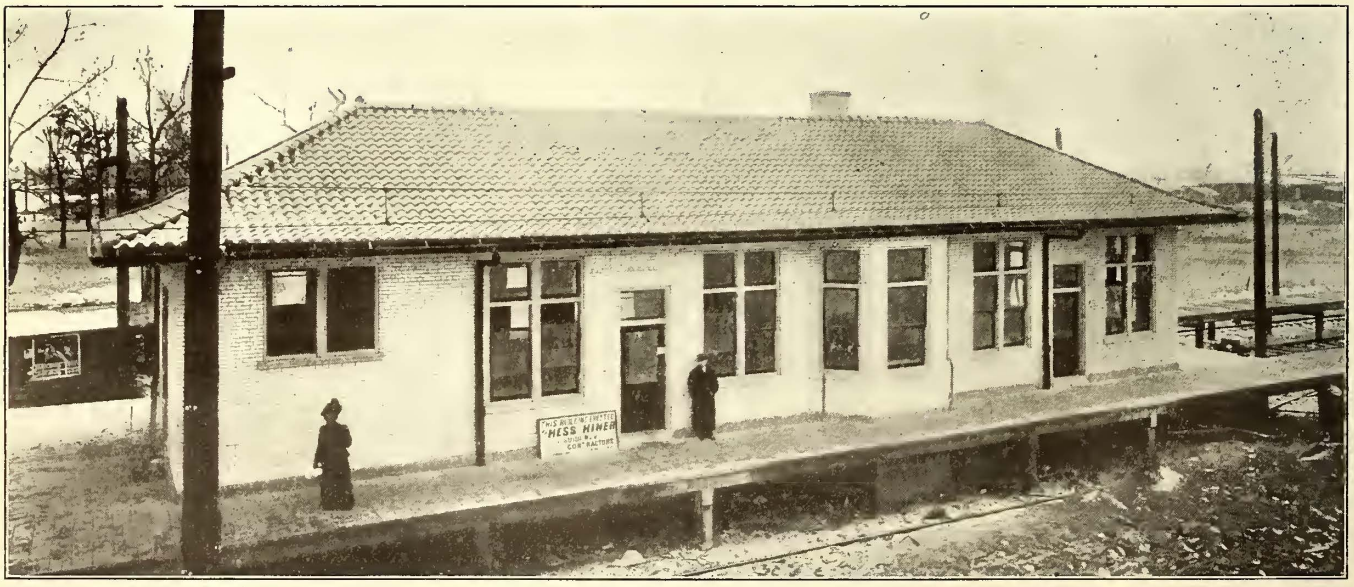
tables are painted with white letters and black background on a piece of tin about 6 in. x 8 in. in size. The permanent-way fixtures have all been installed with regard to the best high-speed service. Semaphores and switch targets are clear of the pole line, whistle posts are placed for each highway and at each local stop posts have been set so that the motorman may more easily stop the car with the rear platform at the best loading point. The name of the next station is painted clearly on each whistle post and every fifth pole is numbered so that car crews may accurately report location.

The schedules offer a local train in either direction every two hours and limited trains in between. On the west end between Gary and Pullman the local service is on 40-minute headway to connect with each Illinois Central Railroad suburban train going into Chicago. An accompanying engraving exhibits the mileages and the one-way and round-trip fares between all stations on the new road. Because of the excellent roadbed the cars of this road can make fast time. The limited trains between Pullman and South Bend make the run of 77 miles in 2 hours and 15 minutes. It requires 45 minutes to travel by the Illinois Central suburban express trains from Randolph Street to Pullman, a distance of 15 miles. Thus

MILES	South Bend, Ind.	Chain Lakes.	Lydick.	Terre Coupee.	New Carlisle.	Hudson Lake.	Smith.	Springville.	Michigan City.	Furnessville.	Mineral Springs.	Dune Park.	Miller.	Aetna.	Gary.	East Chicago.	Hammond, Ind.	Hegewisch, Ill.	Pullman.	FARES
		.10	.15	.20	.25	.30	.40	.55	.65	.80	.85	.65	1.10	1.10	1.15	1.25	1.25	1.30	1.35	South Bend, Ind.
		.20	.25	.35	.45	.50	.70	.90	1.00	1.20	1.35	1.55	1.75	1.75	1.85	2.05	2.05	2.15	2.25	
6.0			.05	.10	.15	.20	.32	.44	.55	.70	.75	.85	1.00	1.00	1.03	1.15	1.15	1.20	1.25	Chain Lakes.
			.10	.20	.25	.35	.50	.70	.90	1.10	1.25	1.45	1.65	1.65	1.75	1.95	1.95	2.05	2.15	
7.0	1.0			.10	.10	.15	.30	.42	.55	.70	.75	.85	1.00	1.00	1.03	1.15	1.15	1.20	1.25	Lydick.
				.20	.20	.25	.50	.70	.90	1.10	1.25	1.45	1.65	1.65	1.75	1.95	1.95	2.05	2.15	
12.0	6.0	5.0			.05	.08	.24	.32	.40	.55	.60	.70	.85	.85	.90	1.00	1.00	1.05	1.10	Terre Coupee.
					.10	.15	.35	.55	.70	.90	1.05	1.25	1.45	1.45	1.55	1.75	1.75	1.85	1.85	
14.0	8.0	7.0	2.0			.05	.15	.28	.40	.55	.60	.70	.85	.85	.90	1.00	1.00	1.05	1.10	New Carlisle.
						.10	.25	.50	.70	.90	1.05	1.25	1.45	1.45	1.55	1.75	1.75	1.85	1.85	
16.0	10.0	9.0	4.0	2.0			.14	.25	.35	.50	.55	.65	.80	.80	.85	.95	.95	1.00	1.05	Hudson Lake.
							.20	.45	.60	.80	.95	1.15	1.35	1.35	1.45	1.85	1.85	1.75	1.85	
22.0	16.0	15.0	10.0	8.0	6.0			.12	.25	.40	.45	.55	.70	.70	.75	.85	.85	.90	.95	Smith.
								.20	.40	.60	.75	.95	1.15	1.15	1.25	1.45	1.45	1.55	1.65	
28.0	22.0	21.0	16.0	14.0	12.0	6.0			.15	.30	.35	.45	.60	.60	.65	.75	.75	.80	.85	Springville.
									.20	.40	.55	.75	.95	.95	1.05	1.25	1.25	1.35	1.45	
34.0	28.0	27.0	22.0	20.0	18.0	12.0	6.0			.15	.20	.30	.45	.45	.50	.60	.60	.65	.70	Michigan City.
										.20	.35	.55	.70	.75	.85	1.05	1.05	1.15	1.25	
41.0	35.0	34.0	29.0	27.0	25.0	19.0	13.0	7.0			.08	.18	.28	.30	.35	.45	.45	.50	.55	Furnessville.
											.15	.60	.50	.50	.60	.80	.80	.80	1.00	
45.0	36.0	38.0	33.0	31.0	26.0	23.0	17.0	11.0	4.0			.08	.20	.20	.30	.40	.40	.45	.50	Mineral Springs.
												.15	.35	.40	.50	.70	.70	.60	.60	
49.0	43.0	42.0	37.0	35.0	33.0	27.0	21.0	15.0	8.0	4.0			.12	.15	.20	.30	.30	.35	.40	Dune Park.
													.20	.25	.35	.55	.55	.65	.75	
56.0	50.0	49.0	44.0	42.0	40.0	34.0	28.0	22.0	15.0	11.0	7.0			.05	.08	.18	.18	.23	.28	Miller.
														.10	.15	.35	.35	.45	.55	
57.0	51.0	50.0	45.0	43.0	41.0	35.0	29.0	23.0	16.0	12.0	6.0	1.0			.05	.15	.15	.20	.25	Aetna.
															.10	.30	.30	.40	.50	
60.0	54.0	53.0	48.0	46.0	44.0	38.0	32.0	26.0	16.0	15.0	11.0	4.0	3.0			.10	.10	.15	.20	Gary.
																.20	.20	.30	.40	
67.0	61.0	60.0	55.0	53.0	51.0	45.0	39.0	33.0	26.0	22.0	16.0	11.0	10 0	7.0			.05	.10	.15	East Chicago.
																	.10	.20	.30	
69.0	63.0	62.0	57.0	55.0	53.0	47.0	41.0	35.0	28.0	24.0	20.0	13.0	12.0	6.0	2.0			.05	.10	Hammond, Ind.
																		.10	.20	
71.0	65.0	64.0	56.0	57.0	55.0	46.0	43.0	37.0	30.0	26.0	22.0	15.0	14.0	11.0	4.0	2.0			.05	Hegewisch, Ill.
																			.10	
77.0	71.0	70.0	65.0	63.0	61.0	55.0	49.0	43.0	36.0	32.0	28.0	21.0	20.0	17.0	10.0	6.0	6.0			Pullman.

Light face type figures show single fares. Heavy face type figures show round trip fares.

Chicago, Lake Shore & South Bend—Through Passenger Tariff and Mileage Chart



Chicago, Lake Shore & South Bend—Station at Gary, Ind.

the trip between Chicago and South Bend, 92 miles, can be made in three hours. Limited trains make stops in but six towns in the 77-mile run. Local trains stop on signal at all highway crossings in the country and at all street crossings in the cities, and make the 77-mile run in 2 hours and 55 minutes.

The personnel of the managerial and operating staff of the Chicago, Lake Shore & South Bend Railroad includes: H. U. Wallace, general manager and purchasing agent; G. A. Buchanan, superintendent; Fred Hume, electrical engineer; T. R. Cummins, engineer maintenance of way; George F. Faber, traffic manager.

PUBLICITY SERVICE IN NEW JERSEY

The Public Service Corporation of New Jersey is another of the large companies which has recently established a publicity campaign to enlighten the public on some of the difficulties of conducting a railway and lighting business, and thus create more friendly relations with the community which it serves. The announcements which it has been publishing have taken the form of a series of advertisements in the Newark papers at intervals of about once a week, commencing with Jan. 25. The company supplies electric lighting, gas and railway service, so that the topics discussed relate to all three of these utilities. One of the early articles says:

We are well aware of the fact that many of the criticisms leveled at us have been unjust and unmerited because they were based on a misapprehension of the facts. We are not finding fault with honest criticism. On the contrary, when just criticism is offered in a spirit of fairness, we will welcome it and try to profit by it, but we do not think that we should be measured by the standard of the irresponsible critic who puts surmises forth for facts, lets prejudice supplant judgment or permits a plain grouch to take the place of reason.

Another article says:

When you hear a man talking about what he would do if he were only running the trolley roads it doesn't necessarily follow that the speaker is endowed with superior talent which would enable him to stand out pre-eminently as an operator in the street railway world. Maybe, when it came right down to facts, the same fellow wouldn't be able to tell the difference between a deck sign and a switch iron.

But we all talk, and it seems to be one of the weaknesses of human nature that makes men believe they could do so much better than the other fellow if they were in the other fellow's place. That's why so many people think they could run a hotel, a newspaper or a base ball team.

The articles point out that since 1903 the company has expended more than $30,000,000 in improving its railway and gas and lighting systems; has built or rebuilt 156 miles of track; has added 860 cars to its rolling stock equipment; has increased its power station capacity from 47,700 kw to 102,900 kw; is carrying annually about 300,000,000 passengers; that about 65 per cent of each day's riding is done within five hours; and that the cost of supplies of every kind and the cost of living have increased, but that more transportation is being given for 5 cents in the district served by the company than ever before.

The advertisements are two newspaper columns in width and average about 10 in. in length. The series has not been concluded.

The City of Launceston, Tasmania, has voted in favor of establishing a municipally owned tramway system to cost $300,000. Water power owned by the city will be used to generate electricity to operate the lines.

HEARING ON MILWAUKEE FARE CASE BY WISCONSIN RAILROAD COMMISSION

Included in the material presented to the Railroad Commission of Wisconsin as evidence on behalf of the Milwaukee Electric Railway & Light Company in the case involving the rates of fare in the city of Milwaukee, is a report by Dickinson, Wilmot & Sterrett, certified public accountants. Testimony regarding the report was given on Feb. 26 and 27 by Charles J. Marr, resident partner at Chicago of this firm. An abstract of Mr. Marr's testimony was published in the account of the hearing contained in the Electric Railway Journal of March 20, 1909. An abstract of the testimony given by the accountant for the city in this case, Edward E. Gore, was published in the issue of Aug. 1, 1908.

The report of the accountants resulted from an examination of the books of the Milwaukee Electric Railway & Light Company, made for the purpose of ascertaining the investment in the street railway property of the company and the net income from operation in the 10 years from Jan. 1, 1897, to Dec. 31, 1906.

The scope of the examination was defined by the accountants as follows:

The facts to be ascertained are:

The cash investment of the company in the railway property, divided into—

(a) Physical property, i.e., real estate, buildings, plant, railroad and equipment;

(b) Other assets, representing the cash cost to the company of the acquisition of the various properties necessary for the consolidation into a unified electric system of the various separate companies with inferior systems of traction which existed prior to the date as of which our investigation commences.

The gross earnings from operation for the period of 10 years.

The operating expenses proper, comprising those expenses which are generally included under the head of operating expenses, such as maintenance of way and structures, maintenance of rolling stock, conducting transportation and general expenses, but not taxes or depreciation.

The legitimate deductions to be made in respect of—

Taxes;

Depreciation or wear and tear of the operated property;

Provision for depreciation or extinguishment of other assets;

Other deductions.

COST OF PROPERTY

The report then refers to the history and organization of the company. After describing the steps leading to the acquisition of the property by the present company and the basis of the issue of securities, the report continues:

On the showing of these facts and precise figures, which were put in evidence in the 4-cent fare case in 1897 and accepted by the court as authentic and conclusive, we have adopted the figure of $10,511,581.78 as the total cash invested in the property at the inception of the present company, of which $8,885,644.17 is applicable to the railway and $1,625,937.61 to the lighting property. The figure of $8,885,644.17 is somewhat less than that arrived at by the city's accountants, and it is perhaps unnecessary to explain exactly how the difference arises.

With regard to the additions or expenditures since Jan. 1, 1897, these amounted to a total of $5,432,868.41, and are made up thus:

New construction charged in the books to:		
Construction account	$5,029,972.06	
Depreciation reserve	861,149.94	
		$5,891,122.00
Less credits to cost of property account in respect of sales in excess of purchases of real estate, etc		458,253.59
		$5,432,868.41

These figures will agree with the city's accountants'

figures if we include therewith the amount of $861,149.94 reported by them as having been charged to depreciation reserve and the balance of purchases and sales of property charged and credited direct to cost of property ($458,253.59), and not to construction account. A comparison of our figures with those of the city's accountants follows:

	City's accountants' figures.	Our figures.	Excess of their figures over ours.
Original cost	$9,020,146.51	$8,885,644.17	$134,502.34
Construction and improvement expenditures, 1897-1906	5,489,187.67	5,432,868.41	56,319.26
	$14,509,334.18	$14,318,512.58	$190,821.60

The difference of $134,502.34 is due to a difference in the method of ascertaining the first cost of the property, and the second difference, of $56,319.26, is due to a clerical error on their part. In both cases the construction and improvement expenditures include the cost of the Public Service Building.

In their comments relating to the amount on which the company is entitled to a return, however, the city's accountants would take exception to the inclusion in the original investment of any items not represented by physical property at the time the present company was formed. This treatment appears to us to be unsound, and also to be contrary to the ruling of the court in the earlier 4-cent fare case, where precisely the same question arose. * * * Upon the various considerations stated the court reached the conclusion that a substantial sum over and above the cost of reproduction was entitled to equitable consideration as being really and necessarily invested, though it was not essential for the purpose of that case to fix the precise amount.

Accepting this view, it next becomes necessary to consider whether the whole of the excess of the original investment over the value of physical property then existing was both really and necessarily invested in the enterprise. Seeing that the purchase of the several old lines was essential to the consolidation of the railways, which was the object of the formation of the Milwaukee Street Railway and which has resulted in so greatly improved service and facilities for the citizens of Milwaukee, it would seem not unreasonable to claim that the amount of the bonded debt of that company and of the underlying mortgages, which the new company was compelled to assume or provide for, fairly represents the amount really and necessarily invested. On this basis the investment would be $9,921,700, or $1,036,055.83 more than is shown by us. Our figure represents as nearly as can be ascertained the actual outlays on the property in cash, and it seems to us that no possible exception can be taken to this figure as being really and necessarily invested in the property.

In effect it seems to us that out of the needs of the public for a new and improved service and out of the readiness of the investors to provide for these needs there grew in effect a well understood and clearly defined partnership or community of interest, in which one party, the city, expected to receive, and did receive, very great practical benefits without assuming any risk, and the other party, at its own risk, contributed in good faith a large sum of money for the purpose of providing those benefits. It would be in the highest degree inequitable for the city to deny those contributing the necessary capital any return on a portion thereof merely on the ground that it is not now represented by physical property.

GROSS EARNINGS AND OPERATING EXPENSES

The books and records of the company show the gross earnings to have been $21,683,929.39 for the 10 years, ranging from $1,409,017.04 in 1897 to $2,973,443.17 in 1906.

The books and records of the company show the operating expenses to have been $11,158,573.12, ranging from $1,007,019.64 in 1897 to $1,455,763.88 in 1906. These comprise all expenses ordinarily comprised under the head of operating expenses, but not taxes or any provision for depreciation or accruing renewals. The figures ascertained and reported by the city's accountants differ from the book figures by an aggregate amount of $750,441.97, they having eliminated items amounting to $750,441.97, which they consider to have been improperly charged to operating expenses in the books.

After giving a summary of the items thus eliminated by the city's accountants, Dickinson, Wilmot & Sterrett continue as follows:

With regard to the items of $136,337.98 and $4,342.47, the city's accountants, while excluding these items from operating expenses, have not included them either in construction or reconstruction. We have, however, in our accounts taken them into the reconstruction account, and inasmuch as the difference between the total construction and reconstruction expenditures on the one hand and the appraised value of the property on the other is dealt with by us as depreciation, the effect of the transfer of the items to reconstruction is to increase the amount of the charge for depreciation, and it follows that the elimination of the items from operating is of no ultimate effect on the question of net earnings.

TAXES

The taxes charged to the railway in the books and accounts of the company have amounted to $1,014,669.35. This is the aggregate amount reserved for taxes in the 10 years, in conformity with the policy of the management to provide monthly for charges of this nature by means of reserves based on certain definite percentages of the gross earnings. On the basis of the taxes actually paid and chargeable in each year the total charge amounted to only $932,001.84, and the city's accountants have adjusted the amount accordingly, and no exception is taken to the adjustment.

DEPRECIATION

In taking up the subject of depreciation the report enters fully into the theories and conclusions of the city's accountants, saying in part:

It has been the practice of the company since the commencement to set aside annual reserves for depreciation beginning with arbitrary sums of $180,000 each in 1898, 1899 and 1900 and thereafter based on 10 per cent of the gross earnings. The total so set aside in the 10 years ended Dec. 31, 1906, has amounted to $2,063,511.16, equivalent to an average of $206,351.11 per annum. The city's accountants take exception to the charge as excessive and in their adjusted accounts have substituted therefor a provision of $1,734,714.35, equivalent to $173,471.43 per annum, the reserve so allowed by them being calculated at 8 per cent of the annual gross earnings, which they state is "regarded as sufficient by some authorities who have carefully investigated the subject."

The identity of these authorities is not disclosed in their report, but it may perhaps be assumed that one of them was the case of the City of Chicago. Two objections to this case as an authority are:

Firstly—That the rates fixed in the ordinance are to be regarded as minima only since special provision is made that the amount of .14 per cent fixed for the maintenance, repairs and depreciation is not to be held as limiting in any way the obligation of the company to expend whatever sums may be necessary.

Secondly—That the regular fare in Chicago is 5 cents per passenger, whereas in Milwaukee, by reason of the sale of 25 tickets for $1 and 6 tickets for 25 cents since 1900, the rate has averaged 4¾ cents per passenger for the whole term of 10 years. It is obvious that the same percentage of gross earnings will not provide for depreciation regardless of the rates charged, and the arguments which would justify a charge of 8 per cent in Chicago would indicate a rate of 8.421 per cent in Milwaukee, either charge being equivalent to $0.004 out of each fare collected.

While the rate of fare has averaged 4¾ cents for the whole term of 10 years, it is necessary to explain that in 1905 and 1906 the averages were only 4.35 cents and 4.32 cents, respectively, which would justify a reserve of 9.238 per cent.

Clearly the only proper way in which depreciation can be provided for by a percentage of gross earnings is as a matter of convenience after the actual depreciation has been ascertained from a study of physical facts. Comparisons with other properties and a consideration of the

adequacy of any given percentage in this particular case must, therefore, if they are to be sound, be based on the relation between the amount provided by the percentage and the value of the property subject to depreciation and the estimated life of the different parts of that property.

The report states that this phase of the question was practically untouched by the city's accountants "and such references as are made to physical facts are such as not only would be absolutely inconclusive, if correct, but are also unsound in principle and erroneous as statements of fact." The report then analyzes the references in the report of the city accountants.

ACTUAL DEPRECIATION

Taking up the subject of actual depreciation of the property the report says in part:

For the purpose of determining the actual depreciation in this case the depreciated value at Dec. 31, 1906, as reported by the valuation staff of the Railroad Commission predecessor company show that approximately $3,000,000 was expended in cash on the property (excluding real estate purchased) between the years 1891 and 1893. The depreciation on this property may for the present purpose fairly be assumed as 5 per cent per annum for three years, which would give a value at Jan. 1, 1897, for the property so acquired of about $2,550,000

To this there should be added the real estate shown in the Clark appraisal 450,000

And also the value of the mileage (20 miles) and of the equipment, estimated at 60 cars, and of the plant and buildings of the West Side Railroad, which was electrically equipped about the year 1890. This value may be taken at $30,000 a mile, or $600,000, less depreciation for, say, six years at 5 per cent, $180,000. 420,000

$3,420,000

Allowing for the Whitefish Bay dummy line and equipment and for miscellaneous buildings and other property

THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY

TABLE OF RATES OF DEPRECIATION SUGGESTED AS APPLICABLE TO ELECTRICAL STREET RAILWAY PROPERTIES, SUBMITTED WITH REPORT OF DICKINSON, WILMOT & STERRETT, ACCOUNTANTS FOR THE COMPANY

	J. I. Beggs		Engineer of Valuation Staff of R.R. Commission		Chicago Union Traction Company				Third Avenue, N. Y.	Cardiff (Eng.) Company	Glasgow Tramways	Officials of the M. E. R. & L. Co.	Rate adopted in adjusted accounts
					Adopted by Company		Recommended by Stone & Webster						
	Life	Rate	Life	Rate	Life	Rate	Life	Rate	Rate	Rate	Rate	Rate	
Track and Roadway:		Per cent	.....	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
Track, Ties, Bonding, etc.	12	8.5	.....	.....	12.85	7.75	13.86	7.2	8 to 9	5	8	7.5	7.5
Special Work and Installation	12	8.5	8–14	12.5–7	12.85	7.75	13.86	7.2	.....	5	.....	12	8
Paving and Grading:													
Granite Block	12	8.5	.....	.....	16	10–4	16	10–4	.....	5	.....	10	8
Cobble Stone	.....	.....	.....	.....	25		25		.....	.....	.....	.....	.....
Asphalt	.....	.....	.....	.....	10		10		.....	.....	.....	.....	.....
Ballasting	12	8.5	.....	.....	.....	.....	.....	.....	.....	5	.....	5	.....
Rolling Stock:													
Bodies and Trucks	15	6.66	15–20	6.66–5	20	5	20	5	5	10	7.5	7.5	5
Electrical Equipment	12	8.5	.....	.....	12–15	8.5–6.66	12–15	8.5–6.66	.....	10	7.5	6	7.5
Fenders, Registers, Lights, Clocks, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	.....	10	10
Overhead System:													
Poles	12	8.5	.....	.....	.....	.....	.....	.....	.....	.....	3.06	7.5	5
Iron	.....	.....	40	2.5	20	5	20	5	.....	.....	.....	.....	.....
Cedar	.....	.....	12–15	8.33–6.66	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wiring, Fittings, etc.	12	8.5	.....	.....	7–10	14–10	7–10	14–10	.....	.....	3.06	7.5	10
Underground System:													
Conduits	.....	.....	.....	.....	.....	.....	.....	.....	3	3	3.06	2	2
Feeders, Cables, etc.	.....	.....	25	4	.....	.....	.....	.....	3	3	3.06	5	4
Power Plant Equipment:													
Engines	.....	.....	15–20	6.66–5	15	6.66	20	5	4	5	5	5	5
Boilers	.....	.....	12–15	8.5–6.66	15	6.66	20	5	.....	5	5	7.5	7.5
Heaters, Economizers, Pumps, etc.	.....	.....	.....	.....	15	6.66	20	5	.....	5	5	5	7.5
Piping	.....	.....	20	5	15	6.66	20	5	.....	5	5	7.5	5
Traveling Crane	.....	.....	.....	.....	15	6.66	20	5	.....	5	5	3	5
Belting, Shafting, Ropes, etc.	.....	.....	.....	.....	15	6.66	20	5	.....	5	5	7.5	5
Coal and Ash Conveyors and Hoist Wagons	.....	.....	5	20	15	6.66	20	5	.....	5	5	10	5
Dynamos	.....	.....	20	5	15	6.66	20	5	.....	5	5	7.5	5
Generating Apparatus	.....	.....	20	5	15	6.66	20	5	.....	5	5	5	5
Storage Battery	.....	.....	.....	.....	15	6.66	20	5	.....	5	5	10	10
Switchboard and Cables	.....	.....	50	2	15	6.66	20	5	.....	7.5	5	5	5
Shop Tools and Machinery	.....	.....	10–30	10–3.33	20	5	20	5	.....	7.5	7.5	7.5	7.5
Buildings and Improvements	.....	.....	50	2	50	2	50	2	2	2.5	2.5	3	2
Power Plants	.....	.....	.....	.....	20	5	50	2	.....	.....	.....	.....	.....
Telephone System	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.5	7.5
Furniture and Fixtures	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.5	5	5
Engineering and Superintendence	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
Miscellaneous	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5

Notes.—The rates mentioned by Mr. Beggs were those quoted by him in the Milwaukee Railway 4-cent fare case in 1897.

The rates appearing in the column headed "Engineer of Valuation Staff" are the rates quoted by W. D. Pence, the engineer who had charge of the valuation of the Milwaukee Electric Railway & Light Company's property.

The rates quoted for the Third Avenue (N. Y.) Railroad Company are the rates testified to by M. G. Starrett and others in the franchise tax case.

of Wisconsin may be adopted as the fair present value, and the report of the city's accountants as to the amounts expended for construction and reconstruction (corrected as to palpable accounting errors) may be accepted as a sufficiently correct statement of the amount expended on the property in the 10 years; thus two out of the four factors required to ascertain the depreciation during that period are known, and it only remains to ascertain the depreciated value of the property in service at Jan. 1, 1897.

In connection with the 4-cent-fare case in 1897 testimony was given by W. J. Clark that the "value new" of the property in existence at Jan. 1, 1897, was $5,153,268.76 and this testimony was accepted by the court as substantially correct. Unfortunately this valuation does not include any statement of the depreciation accrued or the depreciated values at that date, and it is, therefore, necessary to estimate the amount of that depreciation.

Much of the property included in the Clark appraisal must have been comparatively new, as the accounts of the taken over and adding, say, 12 per cent for engineering and superintendence, interest during construction and contingencies, it would seem that a fair depreciated value to be placed upon the property at Jan. 1, 1897, would be not less than $4,000,000. This value would be equivalent to 77.62 per cent of the new value, including real estate, or practically the same proportion that the depreciated value at Dec. 31, 1906, reported by the valuation staff bears to the new value at that date, which, to a certain extent, confirms the result already arrived at, since the property, being to a large extent new in 1896, cannot be supposed to have fallen in value to a smaller percentage of cost than the property in 1906.

Accepting the foregoing estimate as correct, the report adds to the $4,000,000 stated the expenditures on the property during the 10 years, excluding repairs charged to operating expenses, these expenditures amounting in the aggregate to $7,277,146.18. There was deducted

$458,253.59 for sales in excess of purchases of real estate and other property, making together a total expended on the property of $6,818,892.59, or a final total of $10,818,892.59. From this total the value of property in existence at Dec. 31, 1906, in its then existing condition as estimated by the valuation staff, $7,161,926, was deducted, leaving as the balance or difference, being the loss or waste by depreciation in the 10 years, $3,656,966.59. The report adds:

We should explain that the report of the appraisers does not anywhere specify the precise figure of $7,161,926 above quoted. It gives the values "new" and "depreciated" of the operated property of the two railway companies together and separately, but it does not separate the values of the non-operated property. We have, therefore, for the purpose of the present report, adopted the figures quoted by the city's accountants in this connection, which are $9,410,177 for "new" and $7,161,926 for "depreciated" values of the Milwaukee Electric Railway & Light Company, as compared with the corresponding figures in the valuation staff's report of $8,931,317 and $6,742,271 for operated property only, and we have assumed that the city's accountants were correctly informed of the division of the values of the non-operated property. We have further assumed that on the whole the division by the valuation staff of the values of the property common to both railway and lighting has been made in the same relative proportions as that made by the city's accountants, which latter was based on the proportion of the current supplied to the two departments.

DEPRECIATION AND MAINTENANCE

It will be generally recognized that the depreciation of a property depends to a considerable extent on the way in which it is maintained and it may, therefore, be useful now to consider the charges for depreciation in conjunction with those for maintenance. In doing so a valuable standard of comparison is to be found in a report made by Stone & Webster, engineers, under instructions of Judge Grosscup, of the United States Circuit Court, in Chicago. In a lease of the North and West Chicago Street Railroad Companies to the Chicago Union Traction Company it was provided, among other things, that there should be deducted from the gross income "a reasonable charge for depreciation of the plant and equipment" and, exception having been taken by the lessor companies to the deductions made by the lessee company under this head and the lessee company being at the time in the hands of a receiver, Stone & Webster were retained by the court to report what would be a reasonable deduction for depreciation. It will be seen, therefore, that that report was made by a strictly impartial authority, acting under instructions of the court, and not in the interests of either party to the suit, and, in view of these facts and of the high standing of the engineers, it may be regarded as authoritative.

The provision for depreciation recommended by the engineers was equivalent to 5.59 per cent of the original cost in the case of the North Chicago lines and 5.68 per cent of the original cost in the case of the West Chicago lines. The total charge in respect of maintenance and depreciation recommended by them was equivalent to 21.77 per cent and 23.70 per cent of the gross earnings of the North and West Side lines, respectively. For the purposes of comparison with the Milwaukee company, Dickinson, Wilmot & Sterrett said, it was necessary to allow for the difference in the rate of fares. To provide the same amount as would be derived from 22.73 per cent (being the average of Stone & Webster's figures) of a 5-cent fare would require 23.93 per cent of a 4.75-cent fare, which is the average received in the city of Milwaukee in the 10 years ending with 1906.

The provision for depreciation arrived at by Dickinson, Wilmot & Sterrett is equivalent to 5.37 per cent on the cost of the physical property, the percentage being determined thus:

	Additions.	Balances.	
Reproductive value of physical property at Jan. 1, 1897 (per Clark valuation)	.....	$5,153,268.76	
New credits, year 1897	*$248,007.75	4,905,261.01	
Additions, year 1898	221,482.22	5,126,743.23	
Additions, year 1899	379,555.72	5,506,298.95	
Additions, year 1900	593,261.50	6,099,560.45	
Additions, year 1901	529,635.49	6,629,195.94	
Additions, year 1902	730,466.46	7,359,662.40	
Additions, year 1903	931,403.18	8,291,065.58	
Additions, year 1904	930,015.15	9,221,080.73	
Additions, year 1905	598,500.11	9,819,580.84	
Total additions	$4,666,312.08	.....	
Total balances		$68,111,717.89	
Average balance		$6,811,171.78	
Total depreciation		$3,656,966.59	= 5.37 per cent
Average depreciation		$365,696.65	= 5.37 per cent

*Debit.

The report continues:

The combined depreciation and maintenance arrived at by us are equivalent to 25.37 per cent of the gross earnings, as will be seen from the following table:

Depreciation during the 10 years	$3,656,966.59
Add:	
Maintenance of road and structures, included in operating expenses	915,949.77
Maintenance of rolling stock, included in operating expenses	929,360.11
Total maintenance and depreciation	$5,502,276.47
Gross earnings for 10 years	$21,683,929.39
Percentage maintenance and depreciation to gross earnings	25.37 per cent

On the other hand, the depreciation provided by the city's accountants is 2.55 per cent on the cost of the physical property and their combined allowances for maintenance and depreciation just 16.5 per cent of the gross earnings.

The question of depreciation is not frequently a difficult one to deal with—we do not mean the question of deciding whether depreciation has or has not accrued, because the inevitableness of depreciation must be recognized like any other economic truth—but the matter of determining the amount of depreciation which has taken place and of making adequate provision for it as it accrues from year to year. Fortunately in the present case the ascertainment of the depreciation which has accrued and the amount it is necessary to provide out of revenue to make good that depreciation is less of a theoretical question than it frequently is, because of the fact that we have reliable data as to the property at the beginning and end of the period, as well as in regard to the expenditures during the period.

Amortization or Extinguishment of Amount Invested in Intangible Assets.—The company's franchises expire in December, 1934, and, if it be conceded that the company is entitled to a return on the amount necessarily invested in intangible assets, it follows that provision should be made for repayment of the principal so invested. * * * In view of the uncertainty of the future and the impossibility of forecasting events over so long a period as 38 years, it would be reasonable to claim that the company should recoup itself for its investment by equal annual installments over the period rather than by a sinking-fund plan. Inasmuch as the latter plan would provide for increasingly larger contributions as the years elapsed and for the return of the amount only at the end of the franchise in one lump sum, the return of any substantial proportion of the investment is made dependent on the future, and having regard to all the contingencies that may arise in the future, the company would be justified in expecting a return of the capital ratably over the whole period if, indeed, it might not fairly claim that it should recoup itself over a shorter term.

Difference in Investment in Physical Property at Expiration of Franchise and Scrap Value Thereof.—In our accounts no provision has been made for the loss which may arise under this head, but as the franchise contains no provision by which the city is obligated to pay for the fair value of the tangible property as a going concern at the expiration of the franchise, it would seem proper to consider what the realizable value of that property would be and to provide by annual installments out of income for the difference between that value and the value as a going concern at that date. * * * The property employed in

the operation of a railroad will wear out at different times and must then be replaced and it is found that there is a certain standard of efficiency up to which the property must always be kept to permit of its operation and particularly to permit of its operation so as to give a return on capital such as is under consideration in the present case.

CERTAIN PERCENTAGE OF ORIGINAL COST SHOULD BE MAINTAINED

The report of the valuation staff shows that the property is now worth about 76 per cent of its original cost, and while it is possible that, in view of the expiration of the franchise, the property might be allowed to run down below the standard, there is a certain percentage of original cost, which is probably not lower than 60 per cent, beyond which the property could not be allowed to deteriorate and continue to be operated with safety.

During the 10 years under consideration out of a total depreciation of $3,656,966.59 no less than $1,386,024.18 has been made good by reconstruction expenditures, and this is in spite of the fact that at the commencement of the period a large part of the property was practically new and that the investment has been materially increased during the period.

At any given date the property of the company as a going concern should be worth a percentage of its cost, which may fluctuate within extreme limits of, say, 60 per cent and 85 per cent, and the provisions for depreciation if made on sound principles should be such that at all times there would be in the fund a credit balance substantially equal to the difference between the actual value as a going concern and the new value of the tangible property. We have no figures as to the probable scrap value of the property, but we are of the opinion it would be entirely legitimate to provide a fund which would at the expiration of the franchise amount to a sum sufficient to take care of the difference between the scrap value and, say, a minimum of 60 per cent of the original cost as representing its operating value.

Reserve for Interest on Average Working Capital.—While ordinarily the working capital of a street railway company would not amount to a very considerable sum, seeing that it is largely a cash business, still in actual practice some working capital would be found to be absolutely necessary and the difficulty in the present case is to estimate the amount so required.

RESERVES FOR CONTINGENCIES

The report discusses very fully the reserves which have been set aside from earnings of the company and expresses the following conclusions:

Injuries and Damages.—To deal with these liabilities only as and when they are paid must result in burdening the accounts of one year with expenses which do not belong in that year and in relieving the accounts of prior years of expenses properly chargeable to those years. To allow considerable liabilities of this nature to overlap from one year to another would be evidence of bad management and bad bookkeeping. In view of the fact that in the operation of most carriers there is at all times a considerable liability in respect of pending claims and that at any time the liability may by some unfortunate accident assume very considerable proportions, it is generally recognized as wise to set aside liberal reserves for contingencies and it was a wise step on the part of the management of the Milwaukee Electric Railway & Light Company at the outset to adopt a policy of building up substantial reserves of this character.

Insurance Reserve.—It seems to us that your company is entitled, and as a business proposition is compelled, to maintain reserves to meet possible contingencies of fire or accident. Losses under both of these headings are largely a question of average and a disaster may easily occur in either direction in some year, against the possibility of which a prudent management would carry a reserve.

APPORTIONMENT OF EARNINGS AND EXPENSES BETWEEN THE TWO COMPANIES

The city's accountants having raised a question as to the apportionment of the earnings and expenses between the Milwaukee Electric Railway & Light Company and the Milwaukee Light, Heat & Traction Company, this point is discussed by Dickinson, Wilmot & Sterrett, who say in part:

The earnings credited to the traction company are, of course, the actual earnings which are readily segregated from those of the parent company and no difficulty should arise in this connection, except that it may be well to state that all passengers carried in suburban cars while operated within the city fare limits are considered city passengers and the fares collected from them for their transportation to and fro within the city limits are counted as city fares.

With regard to the division of expenses which are common not only to the two railway companies, but as to some part thereof to the lighting businesses as well, the basis is, generally speaking, as follows:

General Expenses.—After first deducting from the total expenses such items as pertain directly to the railway business, such as reserves for damages and legal expenses, etc., there is then deducted and charged to the lighting business that proportion of the general expenses which the total earnings of the lighting business bore to the total earnings of the railway business in the previous year. The balance remaining for division between the two railway companies is then subdivided between them in the proportion that the car-hours of each company bears to the total car-hours of both companies.

Conducting Transportation.—This comprises wages (consisting mainly of wages of motormen and conductors) and cost of power, i. e., the cost of the power actually supplied to the railway department, and the lighting department having been previously charged with the cost of the power supplied to that department, the whole of the expense of "conducting transportation" is, therefore, chargeable to the two railway companies and is charged to them on the basis of car-hours.

Maintenance of Way and Structures—Maintenance of Rolling Stock.—All expenses under these two heads are applicable to the railway companies and the lighting department is not concerned therein, and, like conducting transportation and general expenses, the maintenance accounts are divided between the two railway companies on the basis of car-hours.

It is possible that some of the expenditures such as "wages of motormen and conductors" or "maintenance of way and structures" could be distributed on some basis other than that of car-hours, such as car-miles, for instance, but we are not prepared to say that the adoption of any of these other bases would lead to more correct results, as this is an important qustion and one requiring careful consideration. The facts will show, however, that heretofore the expenses have been divided in accordance with a carefully thought-out rule, which has been strictly applied, and that there has been no attempt to favor one company at the expense of the other as is suggested by the city's accountants.

THE ARGENTINE CENTENNIAL TRANSPORTATION FAIR IN 1910

The Argentine Republic is extending invitations to manufacturers of railway apparatus and accessories to exhibit at its International Exhibition of Railways and Land Transport to be held in Buenos Ayres, May 25, 1910, to Nov. 25, 1910, in honor of the centennial of Argentine independence. Buenos Ayres has a population of 1,200,000, and is the chief city of a country with 3,000,000 sq. km of fertile territory. It now has 25,000 km (15,500 miles) of railways, but it is hoped to increase this to 100,000 km (62,000 miles) within the next generation. The republic depends upon foreign manufacturers to supply the bulk of this railway material. Applications for space at the exhibit should be sent to the Buenos Ayres executive committee, of which A. Schneidewind, C.E., is president and Ed. Schlatter, C.E., secretary.

BLOCK SIGNALS IN DES MOINES

A simple and reliable block and danger signal has been in use on the lines of the Des Moines City Railway Company and Interurban Railway Company for the past two years. Having tried various makes of signals on the city and interurban lines during the past seven or eight years with indifferent success and feeling the necessity of a simple and dependable signal, E. R. Cunningham, after considerable experimenting, designed a one-wire signal which has been adapted to a number of interesting uses.

The signal is built to be operated either electrically or mechanically by the trolley or car wheel. On city lines it is preferable to operate the signals either electrically or mechanically by the trolley wheel, but for high-speed interurban service, where there are no turnouts, it is preferable to operate them mechanically by the car wheel.

Fig. 1 is the wiring diagram of one complete block between two turnouts, *A* and *B*, designed to be operated mechanically by the trolley wheel. The car entering the block at station *A* passes under the lever 10, raising the movable armature or core 14, the upwardly projecting shaft 16 and the disk 18. Disk 18 then closes contacts 20, 21 and 22. Current passes through the trolley connection 26 to contact 20, through the disk 18 to contacts 21 and 22 in multiple. From contact 22 current passes through the connection 27 to holding solenoid 15, through the connection 28 to contact 29 of the non-interfering relay, through the disk 60 of this relay (providing danger signal 57 is not set, in which case disk 60 would be up and setting circuit would be open between contacts 29 and 30) to contact 30, through the connection 30 to safety signal 32, through the connection 33 to line wire 34 and through polarized relays cut in the line wire at all curves and dangerous points along the line, thence through the line wire to station *B*. The polarized relays set intermediate direction signals which may or may not be used between block stations. At station *B* current passes through the danger signal 35 and the connection 36 to non-interfering relay solenoid 37, through the connection 38 to contact 39, through the disk 40 to contact 41, through the connection 42 to releasing switch 43 and through the connection 44 to ground, 45.

It will be observed that current in passing through solenoid 37 raises disk 47, opening contacts 51 and 52 and

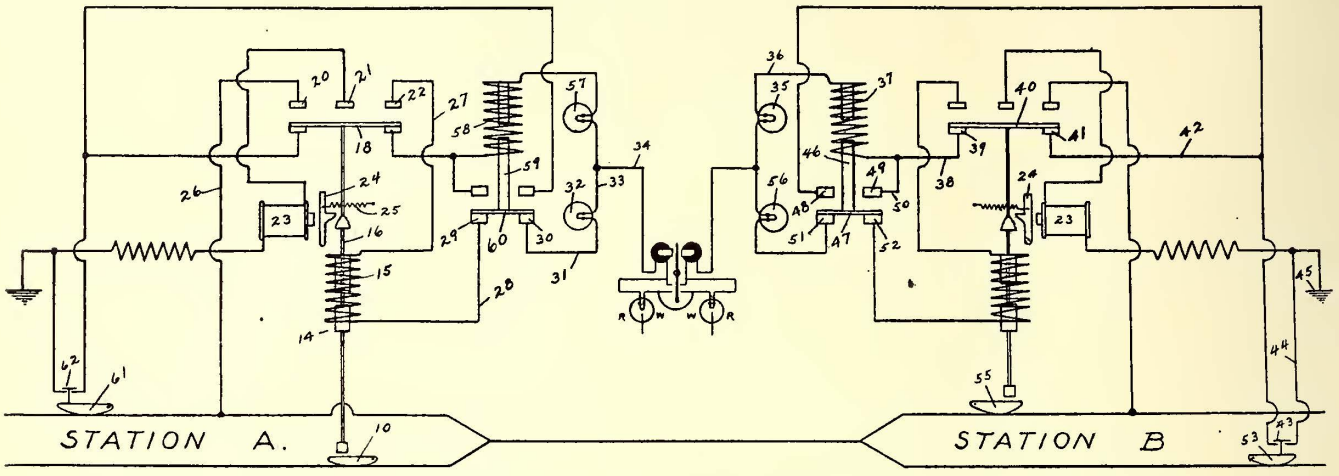


Fig. 1—Diagram of Circuits for Single Block, with Mechanical Trolley-Operated Switches

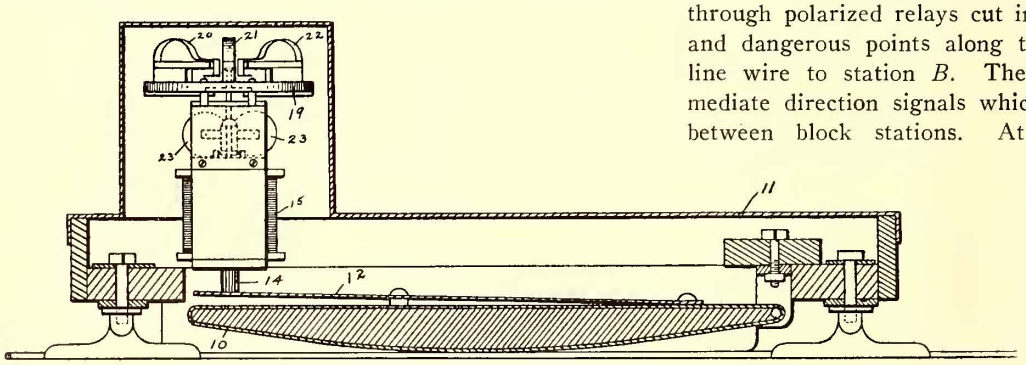


Fig. 2—Mechanical Trolley Setting Switch

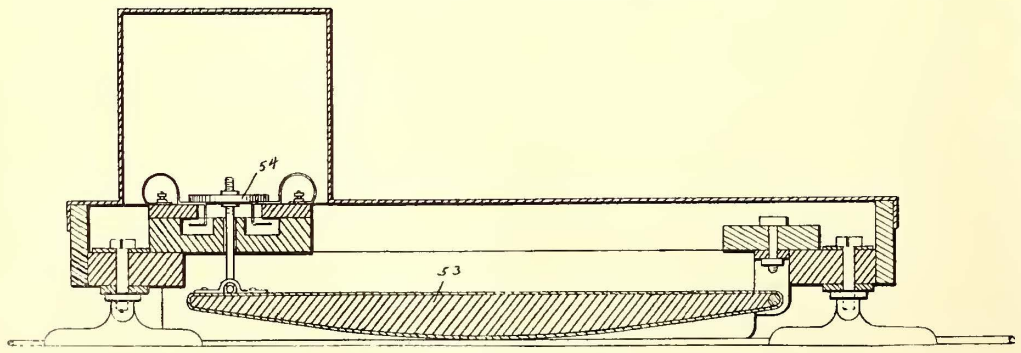


Fig. 3—Mechanical Trolley Releasing Switch

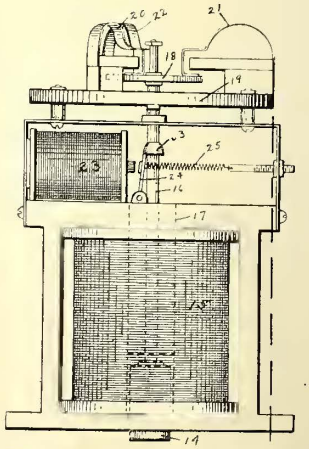


Fig. 4—Detail of Setting Switch

closing contacts 48 and 49, thus cutting out the setting switch at station *B* so that an opposing car at station *B* cannot get a safety signal or release the danger signal by passing under the setting lever 55.

The safety signal 32 at station *A*, the direction signals within the block and the danger signals at station *B* will remain set until the car passes out of the block under the lever when the setting switch is closed, the lock lever is pulled over by the coil spring 25 and engages with lock flange as shown in Fig. 4, when the power goes down on the line. When the setting switch is released by a car passing out of the block by way of the releasing switches, power is retained on the lock magnet until the lock flange has fallen below the lock lever. This is ac-

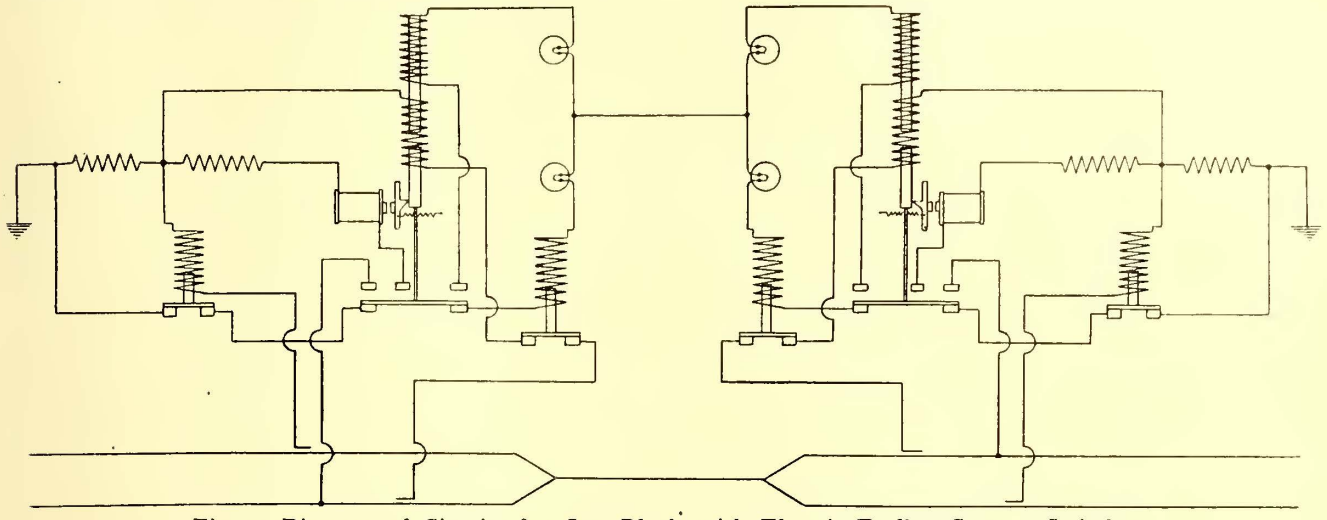


Fig. 5—Diagram of Circuits for One Block, with Electric Trolley Contact Switches

releasing lever 53, which momentarily opens the circuit by means of releasing switch 43. The opening of the circuit by means of the releasing switch allows the moveable portion of setting switch at station *A* to fall by gravity, restoring all signals to position indicating a clear block.

A car entering the block at station *B* by way of setting switch 55, would set safety signal 48 at station *B* and current would flow in the opposite direction through the line wire and polarized relays, setting opposite direction signals through the block and at station *A* would set danger signal 57 and cut out the setting switch at this station by raising disk 60 of the non-interfering relay and would release the signals by passing under the releasing switch lever 61.

The trolley operated setting lever and switch is shown in Fig. 2 and the trolley operated releasing lever and switch is shown in Fig. 3.

If power should go down while a car is in the block the setting switch is automatically locked in position. This is done by means of lock lever 24 engaging with lock-flange 63 of the setting switch (Fig. 4). When the power goes down on the line the holding power of the solenoid 15, which holds the movable portion of the setting switch up, and the holding power of lock magnet 23, which holds the lock lever away from the lock flange 63, are removed simultaneously, and since the inertia of the lock lever is less than that of the movable portion of the setting switch and since the lock flange rests about ⅛ in. above the lock

complished by the spring contacts 20, 21 and 22 following the disk 18 down about ¼ in.

When the signals are operated mechanically by the car wheel the same wiring and connections are used as when operated by the trolley wheel, the only difference being in the design and location of the operating levers and the location of the setting and releasing switches.

The operating levers of the mechanical wheel-actuated switches are located at the side of the rail and are so designed that when a car enters a block the flange of the car wheel runs over the lever, giving it a downward or vertical movement, and when it runs out of the block the flange of the wheel runs between the rail and lever, giving it an outward or horizontal movement. The same lever is connected to both the setting and releasing switches, which are located on a post at the side of the track in such a manner that the vertical movement operates the setting switches and the horizontal movement operates the releasing switches. This gives the track operated signals an advantage over the trolley operated signals, for the reason that if the car enters a block and then backs out it will release the signals. With the trolley operated signals, when a car has entered a block and set the signals it must pass through the block to release them unless an extra releasing switch is provided in advance of the setting switch. The track operated switches can be operated at a higher rate of speed than the trolley operated switches and can be used on lines operating both steam and electric cars.

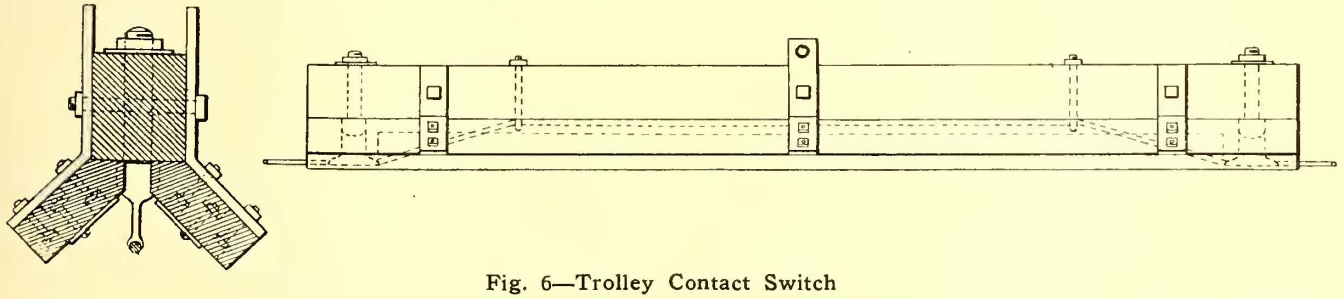


Fig. 6—Trolley Contact Switch

The electrically operated signals operate on the same principle as the mechanically operated signals except that they are set and released by electrically operated solenoids energized by means of a trolley contact. The wiring plan of the electrically operated signals is shown in Fig. 5.

These signals are used in Des Moines not only as block signals on single track, but are used for protecting curves on double tracks that are too close for double-truck cars to pass on the curve. When used for this purpose but one setting and releasing switch is required, as the signals are placed on one track only, usually on the in-bound track, giving the in-bound car the right of way. The setting switch is located on the in-bound track a sufficient distance from the curve so that an in-bound car as it approaches the curve will set a danger signal at the curve far enough in advance to warn the out-bound car and hold it back a safe distance from the curve until the in-bound car has passed around the curve and released the signal. This saves the inconvenience and danger arising from one car having to back up when both have approached too close to the curve to clear each other in passing.

The same setting and releasing switches are used for operating crossing and danger signals, such as bells, semaphores and lights. They are also used to warn towermen in advance of an approaching car, so that they will have plenty of time to operate the interlocking switches; and are also used at stations and car barns to notify the station agent or barn foreman in advance of the arrival of a car so that he may be ready with any orders or supplies that he has for the crew.

The distinguishing features of these signals are their simplicity and the speed at which they can be operated; and since but one wire is used, it is absolutely impossible to set both safety and danger signals at the same time.

The polarized relays used along the line are not a necessary part of the signal, but may be used as an extra precaution to set direction signals at all curves and dangerous points through the block when desired.

STATISTICS OF SURFACE AND ELEVATED ELECTRIC RAILWAYS IN ILLINOIS

A copy of the introduction to the annual report of the Railroad & Warehouse Commission of Illinois for the year ended June 30, 1908, has been received from William Kilpatrick, the secretary. The total number of miles of main line and branches of surface and elevated electric railroads was 1303.91. The interurban electric railways increased their main track mileage by 119.28 miles. The mileage of this class of roads projected for completion during the present year is very large, the report states. An abstract of features of the report relating to surface and elevated electric railways follows:

The statistics contained in the tables relating to electric railways are only applicable to purely interurban lines, incorporated under the general railroad act, and contain nothing in regard to street railways, the latter roads being specifically exempt by statute from the jurisdiction of this commission. The interurban electric road is becoming a very potent factor in the transportation business of our State, and these roads are constantly extending their facilities so as to include sleeping car, express and freight service, adding materially to the convenience of the public.

The capital stock and funded debt of this class of roads for the year ending June 30, 1908, was $209,929,526, an increase of $32,486,519.

The average capitalization, capital stock and funded debt per mile of road of surface and elevated electric railways for the year was $161,000.

The average capitalization (capital stock and funded debt) per mile of surface roads was $83,230. The average per mile of road for the elevated roads was $1,778,631.

The total income from operation of the surface and elevated electric railways for the year was $16,570,381, an increase of $2,614,171. The operating expenses were $9,814,966, an increase of $2,067,634. The income from operation was $6,804,309, an increase of $595,431. Income from property and other sources was $1,020,195, an increase of $127,329, making a total income from all sources of $7,817,865, an increase over the previous year of $716,121.

The fixed charges were $6,464,155, an increase of $1,477,990, leaving a net income of $1,901,035, a decrease of $480,763. This decrease may be accounted for largely by the fact that, in accordance with the requirements of the Interstate Commerce Commission's rules, some of these roads have charged off large amounts to depreciation account.

The total amount paid in dividends by the surface and elevated electric railways for the year ending June 30, 1908, was $1,141,190, an increase over the previous year of $6,825.

The total assets and liabilities (capital stock and funded debt) of the surface and elevated electric railways were: Assets, $222,484,143; increase, $27,009,922; liabilities, $221,158,186; increase, $30,160,145. The net surplus of assets over liabilities was $1,325,957.

PASSENGER AND FREIGHT SERVICE

The total income from passenger service of the surface and elevated electric railways for the year, including mail, express, advertising, etc., was $13,350,168, an increase of $978,472. The total received from freight service was $426,057, a decrease of $168,314. This is largely accounted for by the fact that the Chicago & Milwaukee Electric Railroad showed a large sum as freight earnings for the year ending June 30, 1907, and none at all for the year ending June 30, 1908.

The total earnings and income of the surface and elevated electric railways from all sources for the year were $15,392,609, an increase of $998,052.

The total expenditures in Illinois of the surface and elevated electric railways for the year for maintenance of way and structures, maintenance of equipment, conducting transportation and general and unclassified expenses and fixed charges, were $14,181,546, an increase of $1,822,046.

The number of passengers carried yielding revenue by the surface and elevated electric railways was 210,516,171, an increase of 12,734,260. The number of tons of revenue freight was 854,032, a decrease of 598,086 tons. This decrease, as in the item of freight earnings previously referred to, was largely accounted for by the Chicago & Milwaukee Electric Railroad and by the result of the commercial depression.

The passenger earnings per mile of road were $11,052, an increase of $502. The freight earnings per mile of road were $553, a decrease of $267. The gross earnings per mile of road were $12,914, an increase of $1,362. The operating expenses per mile of road were $7,700, an increase of $1,142. The net earnings per mile of road were $5,314, an increase of $220.

RAILROAD EMPLOYEES IN ILLINOIS

The number of officers and employees on the surface and elevated electric railways for the year was 7467, an increase over the previous year of 790. There was paid in salaries to these employees a total sum of $5,111,572, an increase over the previous year of $631,830.

For the year the average for all classes, including general officers, was $2.25 per day, which is an increase over the preceding year of 6 cents per day.

During the year 743 tons of steel rails were laid and 63,092 new ties were laid on the surface and elevated electric railways in the State. The number of stations on these roads is 391, being a decrease of 50 stations.

The number of highways crossed at grade is 2688, an increase of 213 for the year. The number of overhead highway crossings is 170 and under-highway crossings 138.

The number of miles of road equipped with block signals is 154.79 miles.

The number of passengers killed by the surface and elevated electric railways for the year was 29, an increase of 10; the number of employees killed was 16, a decrease of 3; other persons killed, 68; an increase of 30. Total number of passengers injured, 536; an increase of 58; number of employees injured, 198; an increase of 49; other persons injured, 107; an increase of 39. Total number killed, all classes, 113; an increase over the previous year of 37; total number injured, all classes, 841; an increase for the year of 133.

The amount of taxes paid for the year was $723,476.18, an increase of $39,153.25.

NEGOTIATIONS FOR NEW ORDINANCE IN CLEVELAND

At the meeting of the council committee of the whole, on April 2, Mayor Johnson took the position that if the city should ever exercise the option to purchase the property of the Cleveland Railway, which he proposes shall be incorporated in the franchise, the contract should not contain the provision that the city will be directly liable for the bonded indebtedness of the company. He said that such an agreement would make municipal ownership impossible, or, at least, endanger it, as the State Legislature, in any statute that may be enacted, was not likely to so word it as to include liability for the debts of a street railway company whose property might be purchased. In case the statute did not fit the contract made with the company now, it would be impossible for the city to secure the system, even though it might be willing to do so. He said further, that while the city might be able to raise enough money on new bonds to purchase the stock, it might not be possible to secure enough to pay off the bonds. He objected to any plan that would make the city directly liable for the payment of the bonds, but said that the property itself should be good for them.

President Horace E. Andrews stated that if the company should sell the property to the city, the stockholders would want to transfer all the business and relieve themselves of further responsibility, and would insist that no loophole be left by which the property might be thrown back into their hands. He said he could not understand the idea of the Mayor in insisting that the city should not assume the indebtedness absolutely if it should take over the road at any time.

Attorney John G. White, who drew the new ordinance, said that the Legislature of Ohio would never authorize cities to own street railway systems without making it possible to pay for them.

City Solicitor Newton D. Baker suggested that instead of wording the ordinance as Mr. White had, providing that the city should assume the bonded indebtedness, it should read, "The city shall provide for the bonded indebtedness," or something to that effect. He said that the city could not purchase the property and fail to make provision for the payment of the entire sum agreed upon, including both stock and indebtedness.

The amount of current liabilities the company might have at any time was also discussed at this meeting. At first it was suggested that it should not exceed the amount of cash to be allowed for the interest fund to start with, $500,000, but several other suggestions were discussed. Mr. Andrews said that the sum suggested seemed small, as the business of the company would probably increase with the growth of the city, and that the margin of unfunded debt should vary with the needs of the railway. He suggested that the limit be fixed by allowing a certain percentage on the gross earnings. Mr. Johnson said he felt that 6 per cent would be sufficient, but Mr. Andrews objected on the ground that this would be too small. Secretary Henry J. Davies said that the basis for reckoning the sum should be the capital valuation, and this proved satisfactory to both Mr. Andrews and Mr. Johnson, although the rate was not determined. Mr. Johnson said that the company might expend as much as it pleased and cover it in this form of indebtedness, but that the difference between the amount of the debt and the maximum allowed in the contract should be deducted from the price in the event of purchase by the city. Mr. Andrews contended that this would put the company in the light of breaking its contract, which did not seem right to him. The rate will be discussed later.

CONTROL BY CITY

On the evening of April 2 the question of city control occupied the attention of the committee again. With Mayor Johnson contending that the City Council should have complete control of the schedules and routing of cars, on the plea that it would be to the interest of the owners of the property to keep up the fare, an impartial board of arbitration was proposed to take charge of this phase of the business, one member to be chosen by the city, another by the company and the third by these two. Both the Mayor and City Solicitor Baker opposed this plan, and stated that the City Council should have full control. Judge Tayler made the following statement regarding the subject of city control:

Fundamentally, and so far as this plan of settlement is concerned, the company is not concerned in the control over the service. I think that a large control over the nature of the service and the routing of the cars should repose with the City Council, but the Council is human, and I do not think we can always trust ourselves. The community will feel safer and in better humor with the plan if it is provided that in the event of differences between the railway company and the Council the decision should be left to impartial arbitration. I do not think that serious differences should occur for the reason that the company is guaranteed 6 per cent on its investment, and is under no impulse to increase or reduce the service on its own account. The company will be ready to do as asked by the Council.

So, also, the Council has no interest but that of efficient service that will satisfy the people. But other influences may in time operate either upon the company or the Council. In that event the community would feel safer if it were known that the differences would be settled by an impartial board of arbitration whom we could trust better than ourselves.

Mr. Johnson said he did not agree with Judge Tayler, and insisted that there be no appeal to any other power after the Council had acted. President Andrews expressed a preference for a permanent board of arbitration to pass upon service questions.

Regarding the rate of fare, Mr. Andrews stated that the initial fare should be six tickets for 25 cents or 5 cents cash for a ride. He said that the company would be compelled to raise a large amount of money at once, as improvements were needed badly and 450 pay-as-you-enter cars must be furnished within a few months. A lower fare would not take care of the expenses of operation under the circumstances and yield 6 per cent on the investment. Nothing less than six tickets for 25 cents would meet the necessity at the beginning.

The question of grants in the suburban towns was taken up again. Mr. Johnson stated that the city should have something to say in this matter if the grants affected the car-mile cost of operation; in fact, the Council should have the right to veto any action thus taken. Mr. White said

he was opposed to any kind of a zone system, and that matter should be left to a board of experts to decide.

ENTRANCE OF INTERURBAN LINES

There was also some discussion of the interurban lines and their entrance over the tracks of the local company. Mr. Andrews, in answer to a question, said that the wear on the tracks by the heavy interurban cars was much greater than that by city cars. Mayor Johnson proposed that some limitation as to weight and depth of flange be made to prevent this. A suggestion that the cars be stopped at the city limits did not meet with a hearty reception. Cincinnati had an arrangement of that nature for a long time, but now an effort is under way to get the terminals of all lines into the business section of the city, because of the advantage to business houses and manufacturers.

One of the subjects considered at the meetings on April 3 was the assertion of Mr. Andrews that he would concede a 4-cent fare with 1 cent for transfers, as the maximum in the new ordinance, instead of either the six or seven tickets for 25 cents with the transfer conditions attached, as provided in the two drafts of ordinances under consideration.

Although questioning the advisability of doing so, President Andrews stated that he would concede the matter of putting on 450 pay-as-you-enter cars within a few months after the settlement. He said that about 200 new cars would have to be secured, and that the expenditure would be about $1,000,000. Mr. Andrews believes that the service will have to be increased from 15 to 20 per cent over that existing at present to give satisfaction. On the other hand, he said that the price at which the city should take the property at the end of a fixed period, if it so desires, ought to be 120 instead of 110, as proposed by the Mayor.

Mr. Andrews stated that the company wanted protection against the cutting of service by the City Council to secure very low fare. City Solicitor Baker stated that he would be willing to insert in the franchise a condition that the city should not require so much service as to interfere with the 6 per cent dividend to the stockholders and also make it possible to enter into a new contract if it should be found that the maximum fare was too low. Mr. Andrews said that protection is needed both ways. The company did not want the city to have power to cut the service to such an extent that the people would not be satisfied.

In making improvements and betterments Mr. Andrews said he thought the company should be allowed to proceed without delay. Mr. Johnson said that all the city desired was that the company should not increase its capital account without the consent of the Council.

In making the settlement, City Solicitor Baker said that the Johnson-Goff valuation should be used as the basis. The $2,000,000 allowed for good-will, he said, rather represented consolation to the company for disputes and disagreements in the settlement, and the $6,000,000 for unexpired franchises had been offset to a great extent by the fact that the people rode for nine months at a 3-cent instead of a 5-cent fare.

Vice-President J. J. Stanley and A. B. duPont will begin work on the schedules with the idea of ascertaining a proper car-mile charge for operation to be incorporated in the new franchise.

At the meetings on April 1 the most vital question discussed was that of city control of service and schedules. Mr. White stated that he had modified the Baker ordinance to some extent because of the fact that the City Council, in its desire to secure lower fare, might do great damage to the city by cutting down the service or, for personal reasons, might favor one part of the city as against another. He stated that the referendum vote was against the franchise under which the Municipal Traction Company operated because of the poor service that was given. This was proof that the people wanted a good service, even though the fare was more than 3 cents.

The duty of the Street Railway Commissioner, for which provision is made in the Baker ordinance, would be to furnish information to the City Council. His salary would be $1,000 a month.

The question of suburban lines was raised in this connection. Mr. White said that if the lines to the suburbs were to be treated differently from those inside the city, they would have only the value of junk when the franchises expired. Both Mr. Andrews and Mr. White want the system treated as a whole in anything that is done.

PAY-AS-YOU-ENTER CARS

Mr. Andrews stated that he was not in favor of the provisions of either the White or the Baker ordinance regarding the pay-as-you-enter cars. He said that he had been making a study of pay-as-you-enter cars, and he was not yet sure of their success. In some instances a saving of from 8 to 10 per cent was shown by their use, while in others there was no difference. This class of cars is undergoing development, and he said he would not want to equip the whole system with a certain kind or any kind within a year, and then find that they were not up to date. The subject was passed for the time.

Regarding the date at which a new ordinance should go into effect, the suggestion of City Solicitor Baker that the ordinance terminate on May 1, 1934, was adopted. As provided in the White ordinance, it was agreed that the Neutral Street Railway lines be included in the consideration of the new franchise. The extension of several lines and contracts with interurban railway companies were discussed, but the decisions were left for a future time. The free territory, as provided in the White ordinance, was also discussed, without arriving at a decision. Mayor Johnson suggested a specific valuation of $20,000 a mile in arriving at the cost of joint use of tracks, with a larger amount for special work. Mr. Andrews said that the valuation in future years might be as high as $100,000 a mile, because of the use of underground or elevated tracks. Mr. Baker suggested that the valuation of tracks in free territory be left to arbitration.

Judge Tayler has stated that the greatest difference between the two ordinances is the quality and quantity of supervision to be exercised by the city over the operation of the system. He said that it may cost a certain rate at present to transport a passenger, but in 10 years it may cost half as much or it may cost twice as much. No one can tell anything about it, and for this reason he holds that the sliding scale of rates is the only correct measure to adopt.

REPORT OF SPECIAL MASTER ON CLAIMS

The recapitulation of a partial report made by Special Master Irving Belford to Judge Tayler, of the United States Circuit Court, is as follows:

Claims allowed as preferential		$212,225.37
Claims allowed as preferential, objected to by Cleveland Railway		89,321.57
General claims (extensions, betterments and improvements)		3,542.53
General claims		37,347.63
Claims dated April 27, 1908, and prior:		
Cleveland Railway	$33,844.60	
Municipal Traction Co.	15,334.39	
Forest City Railway	872.45	50,051.44
Disputed claims, subject to further consideration		35,540.02
Personal injury claims, adjusted		5,980.50
Notes of Cleveland Railway—endorsed		182,000.00
		$616,009.06

PROPOSAL OF INTERURBAN ROADS

The discussion on the morning of April 5 related to the questions of admitting interurban cars over the tracks of the local company. President E. W. Moore, of the Lake Shore Electric Railway, and officers of other roads were present. Mayor Johnson said that he did not want to stop the cars at the city limits, but did want the companies to bear their share of the cost of operation. Receivers of the local properties stated that the cost of operating an interurban car was about 10 per cent more than a city car. Mr. Andrews placed the cost somewhat higher. Mayor Johnson proposed that an amount be fixed as the cost of operating the cars of the five interurban companies over the city tracks. If there was a surplus after collecting the fares in the city, it should go to the interest fund to reduce city fares, but if there was a deficit it should be made good by the companies. Attorney T. H. Hoggsett, representing the interurban roads, said that if the companies were to make deficits good they should have the advantage of any surplus that might accrue also. A pooling arrangement among the interurban roads, with a sliding rate of fare was proposed by E. W. Moore, of the Lake Shore Electric Railway. The consideration of the subject was put over for a week, after protests had been made against interference with interurban traffic by the Chamber of Commerce and the Retail Board of the Chamber of Commerce.

A resolution was adopted instructing Prof. E. W. Bemis to make a report on the value of the property, including franchises at the present time. This is the beginning of a contest for a lower basis of valuation; certain members of the council claim that the property has depreciated and the value of the franchises has become less during the past year.

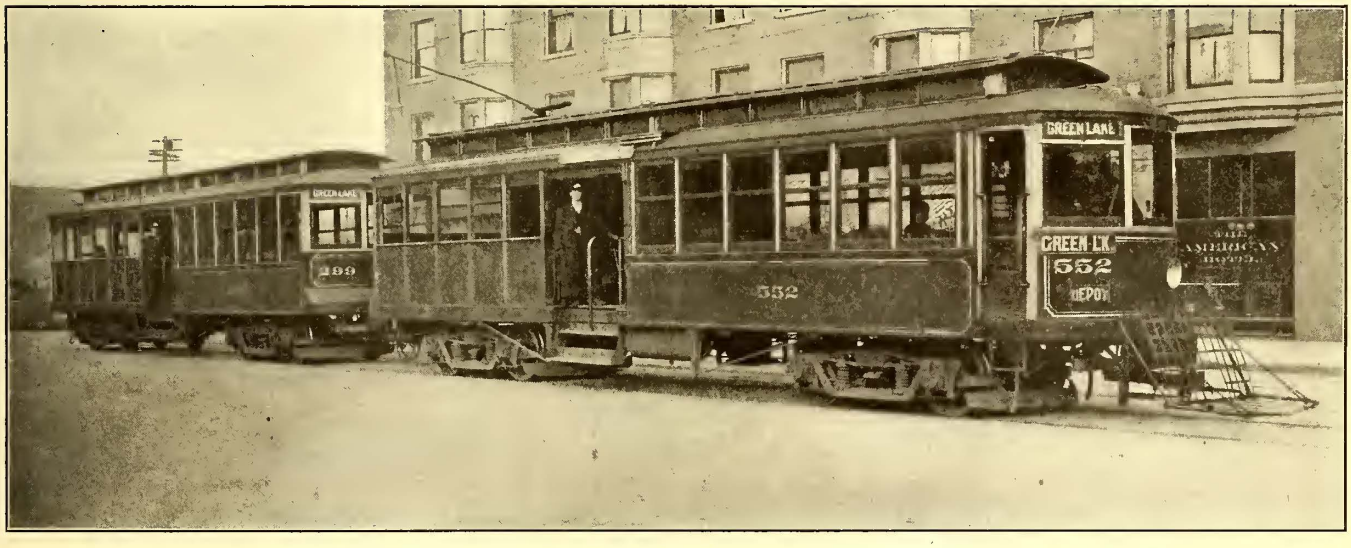
City Solicitor Baker said that if this was true, the people would have to stand it, as there should be no reduction in valuation from that computed when the property was leased to the Municipal Traction Company. Mr. Andrews said that if the council should insist upon a valuation lower than the one fixed it would prevent a settlement, because neither he nor his stockholders would be willing to make any reduction. He said that all the depreciation of the last year, if there had been any, took place after the property was forced out of the hands of the company and that it would have to be borne by the people or anybody else they want to consider liable for it.

STREET RAILWAY ARRANGEMENTS TO HANDLE ALASKA-YUKON-PACIFIC EXPOSITION TRAFFIC IN SEATTLE

The purpose of the Alaska-Yukon-Pacific Exposition, which will be held at Seattle, Wash., from June 1 to Oct. 16, 1909, is to exploit the resources of Alaska and the Yukon territory and to promote trade on the Pacific Coast. The exposition grounds cover 250 acres on the campus of the University of Washington, which will make use of many of the buildings after the exposition closes. The State of Washington has appropriated $600,000 for buildings which will later be used by the University and $400,000 for State buildings. The United States Government has appropriated $650,000 for representation, and citizens of Seattle have subscribed $1,000,000 stock. Work on the buildings has progressed rapidly, and it is believed the exposition will be ready at the time set for the opening.

In anticipation of handling large crowds of visitors to the exposition, the Seattle Electric Company has expended during the last two years a total of nearly $1,750,000 for additional lines to the fair grounds, new cars and additions to its generating equipment. Seattle is growing rapidly, especially in the direction of the university grounds, and while the exposition traffic is expected to bring some immediate returns on the investment in new tracks and cars, the natural growth of the city would probably have required the betterments to be made within a short time.

Seattle has a very hilly and broken surface contour, being built on long, narrow ridges lying between Puget Sound on the west side and Lake Washington on the east side. Lake Union, a large body of water connected by canal with Lake Washington, is situated in the heart of the city, just north of the business section. All of the street car lines which run north and south, parallel with the ridges, are operated by electricity, but there are three crosstown lines operated by cable and running from Puget Sound back to Lake Washington over the steep dividing hills. The exposition grounds are situated on the shore of Union Bay, an arm of Lake Washington, about 5 miles northeast of the center of the city. They are accessible, therefore, by boat trip on Lake Washington as well as by street car. In addition, the main line of the Northern Pacific runs through the grounds, and there is a suburban station and entrance at Brittnall Place, near the south end of the grounds. The Northern Pacific, however, will not run exposition trains from the Union Station in Seattle, unless the street rail-



Two-Car Train to Be Used for Exposition Traffic in Seattle

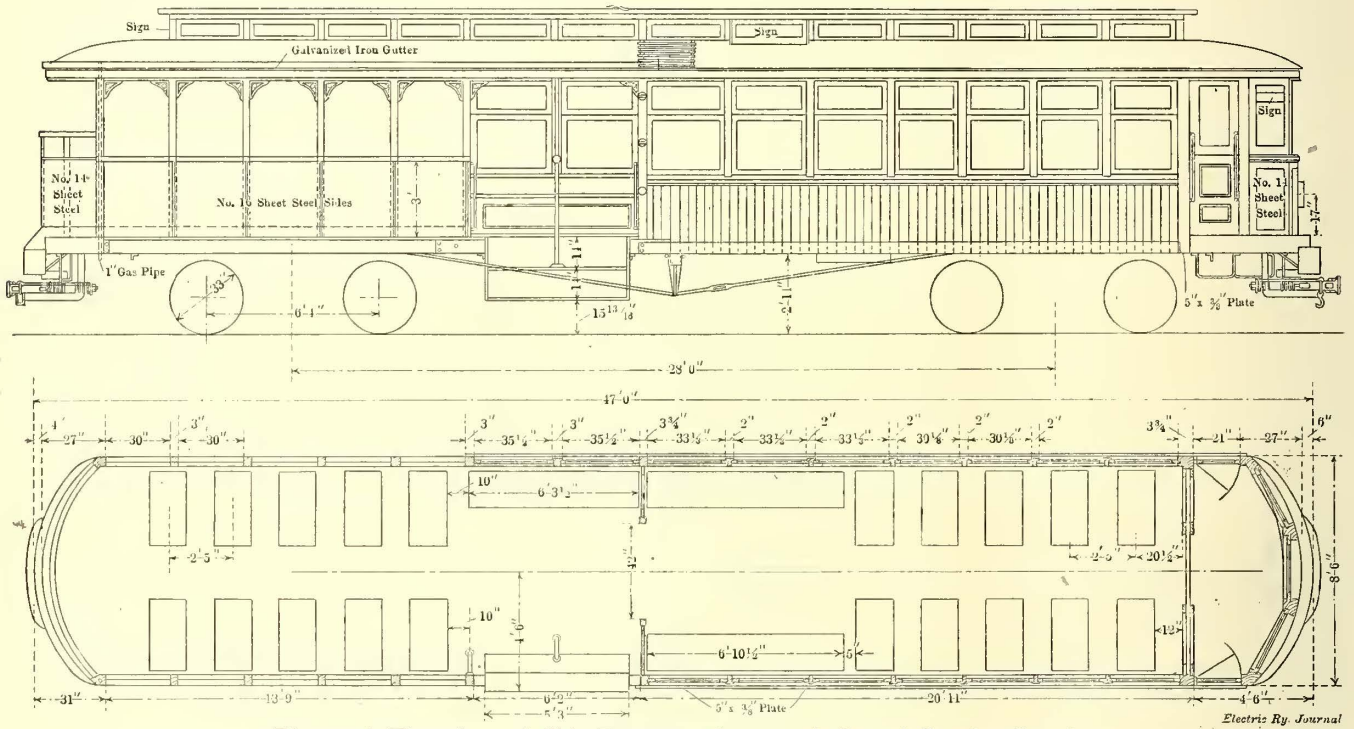
way lines are unable to handle all of the traffic. Local excursion trains from nearby towns will be unloaded at the Brittnall Place entrance, but all overland trains from the east will be run through to the Union Station.

The Seattle Electric Company has three double-track lines leading directly to the main entrance of the exposition grounds. Two of these lines run downtown within one block of the Union Station, so that there will be good service to the grounds for visitors alighting from incoming trains. From the center of the city the Wallingford line makes a wide detour around Lake Union, but the Broadway and Eastlake Avenue lines run parallel to each other straight north until they converge at a bridge crossing the canal connecting Lake Union with Lake Washington. After crossing this bridge the line turns east ½ mile to the exposition grounds. The Wallingford line is less direct, but as it is carried for 1½ miles on a trestle along for storing cars near the grounds and the dangerous grade crossing at Brittnall Place will be removed. An additional improvement made necessary by these changes will be the double tracking of the trestle bridge over the canal.

In addition to these three double-track lines leading to the main entrance of the grounds a fourth double-track line will be built this spring running north from the center of the city on Twenty-fourth Avenue and terminating in a loop near the boat landing wagon entrance.

A fleet of boats will be operated on Lake Washington from landings at the foot of each of the three crosstown cable lines to a direct entrance to the grounds on the shore of Union Bay. Lake Washington has a beautiful shore line and the boat trip is expected to prove very popular.

The directors of the Alaska-Yukon-Pacific Exposition and the transportation companies expect to have 3,000,000 visitors to the grounds during the 138 days the fair is open,



Plan and Elevation of Side-Entrance Open and Closed Car for Seattle

the west shore of Lake Union, on which there are no stops, the cars can be run to the grounds from the Union Depot in 40 minutes, which is approximately the same running time as required on the Broadway and Eastlake Avenue lines.

A number of changes in the track arrangement near the exposition grounds have been made to provide loop tracks and storage tracks. After crossing the bridge over the canal the Broadway line formerly turned east before reaching the tracks of the Northern Pacific and ran south of but parallel to these tracks to Brittnall Place, where it turned north and crossed the steam road at grade. An under crossing has been built just north of the bridge, and the Broadway line now continues under the steam tracks, which are 20 ft. above street grade at this point, before turning east on Fortieth Street. At Fifteenth Avenue, opposite the main entrance to the grounds, a loop has been built, around which the Broadway, Eastlake Avenue and Wallingford cars will be run. The Wallingford line turns east on Forty-fifth Street after making the detour around Lake Union and then south on Fourteenth Avenue to the loop. The old tracks formerly used by the Broadway line lying south of the Northern Pacific tracks will be used only which is an average of nearly 22,000 persons a day. Probably a fair maximum for the big special days of the exposition will be 30,000. A 2½-minute car service past the exposition grounds has been guaranteed by the Seattle Electric Company. On the estimated basis of 3,000,000 people for the 138 days, or 30,000 as a maximum for a day, probably not over 15,000 round-trip passengers will be handled by the street railway system in any one day. With a 2½-minute service and the storage provided for extra cars for the rush hours in the morning and evening the Seattle Electric Company will probably be able to handle the traffic to and from the exposition without undue crowding of the cars or delay due to congestion of terminal tracks.

The Seattle Electric Company is now receiving 100 combination open and closed side-entrance cars which are being built by the St. Louis Car Company. The general design of these bodies is of particular interest because of the door arrangement. Each car has but one entrance which is at the side and just at the rear of the middle of the car. Of this order 64 of the cars are to be equipped with motors and 36 will be trail cars. Illustrations are presented showing the exterior and interior of the car body and the seating arrangement with general dimensions.

The body design is the same for motor and trail cars. The general dimensions of the body follow:

Length over buffers	47 ft.	
Length closed compartment	20 ft.	11 in.
Length open compartment	22 ft.	6 in.
Width over all	8 ft.	8 in.
Height from rail to under side of sill	2 ft.	11 in.
Truck-center distance	28 ft.	
Truck wheel base	6 ft.	4 in.

The underframing of the car body includes side sills of 7-in. 20-lb. I-beams and center sills of 5-in. 12.5-lb. I-beams, faced for the length of the body with long-leaf yellow pine. The I-beams which comprise the underframing are fastened together 12 ft. from the ends with ¾-in. x 4-in. iron plates riveted to the beams. This underframing is so designed that it will clear the motors and trucks when two cars are coupled on a 36-ft. radius curve. All the cross framing is of oak and a clear space is left between the center sills to accommodate the motor-cable conduits and the air-brake pipes. The main flooring is 1-in. x 4-in. yellow pine laid crosswise. On top of this is a second layer of flooring laid lengthwise under the seats only. The depression in the aisle between is fitted

Interior of Side Entrance Car for Seattle

with hard maple floor slats which reach to the same height as the flooring under the seats. The floors in the two sections are at the same level.

The body framing for the closed section has maple side and corner posts and the posts of the open section are of oak. The sides of the car are straight and the box portion is sheathed with ⅝-in. tongued-and-grooved white wood. Vertical strips run from the oak drip rail to the bottom of the side sills. The cars are built for single-end operation and the motorman is given a compartment the full width of the car and about 3 ft. long with two stationary windows and one sliding window at the front end. A sliding door is fitted in the bulkhead between the forward and the passenger compartments. On either side of the motorman's compartment 21-in. swinging doors serve as exits. These doors are cut in half so that the tops can be opened separately. An iron stirrup is provided under each door of the motorman's compartment. In the trail cars there are no doors between the open and closed sections of the car, the opening here being 42 in. wide.

The roof framing is made up of steel carlines with the curved and smaller pieces of ash. The deck rail is yellow pine. Sixteen-oz. No. 8 duck is used to cover the roof. No. 18 sheet steel is used as a headlining. This steel is well painted on top to protect it from dampness and the exposed side within the car is painted and decorated to match the interior finish. Along the ceiling of the car the steel headlining is broken into panels with cherry molding.

The single side entrance and exit used by all passengers is 6 ft. 2 in. wide in the clear and has two steps 5 ft. 3 in. long, the lower one of which is 15 13/16 in. above the top of the rail. The next two risers are each 14 in. high. A heavy pipe stanchion is placed at the middle of the top step. The entrance is provided with Wood folding gates fastened to the car framing and arranged to fold against the car body on one side and to a pipe stanchion on the other. The step treads are supported by steel plates and each is fitted with a Universal safety tread. A similar tread also is placed in the car floor at the entrance, sunk so that its top is flush with the floor.

The bumper of the car is built up of a 4 x 7 angle and a sheet-steel protection enclosing solid oak blocking. This bumper extends the full width of the car and projects 6 in. beyond the face of the dash at the front end and 4 in. at the rear end. There is no paneling on the outside of the dash. The dash of both ends are covered with No. 14 sheet steel arranged for easy removal. Reference to the illustrations will show that these bumpers are built with considerable vertical height so that over-riding may not take place between cars of different heights. Under each bumper is carried a Van Dorn coupler with No. 11½ rigging. The coupler head is supported on an angle-iron carrier of such proportions that any car may couple with another on a 36-ft. curve. Drawbars are placed 19 in. above the tops of the rails.

The closed passenger compartment has seven window openings on a side, each 30⅛ in. wide. The sash are fitted with double thick American glass for the main windows and white chipped glass for the deck openings. The openings between the posts of the open section of the car are 30 in. wide and are fitted with "Oakette" waterproof curtains. Curtain Supply Company fixtures are used.

The interior of the car is finished in cherry except below the arm rail, where No. 16 sheet-steel sheathing is painted and grained to match the natural wood. The exteriors of the car bodies are painted with Harrison Brothers & Company car-body yellow "D" colors.

One of the engravings shows the seating arrangement of these cars. In the box portion of the motor cars are 10 reversible 34-in. cross seats set on 29-in. centers and two 6-ft. 10½-in. longitudinal seats without arm rests. The cross seats are of the St. Louis Car Company's latest design upholstered in rattan. In the trail cars the seats in the box section are stationary with wood strips. In the open section of the motors and trailers are 10 wood-strip seats of dimensions similar to those above given and one longitudinal seat 6 ft. 3½ in. long.

Each car body is carried on two C-50 6-ft. 4-in. wheel-base trucks manufactured by the Standard Motor Truck Company. These trucks have 33-in. wheels and are placed on 28-ft. centers. The electrical equipment includes four GE-80 motors with K-28-J controllers. All light, air-brake and control wiring is carried in Sprague flexible conduit. The brake equipment comprises schedule M E for motor cars and T E for trail cars manufactured by the National Brake & Electric Company. Peacock hand brakes are used. Some of the special fittings on these cars follow: Neal 10-in. headlights, lever-connected sand boxes, International registers, Wilson trolley catcher No. 2.

INVESTIGATION OF THE STREET RAILWAY QUESTION IN DETROIT

The organization of the Committee of Fifty, appointed by Mayor Breitmeyer, of Detroit, to investigate the street railway question, was effected shortly after its initial meeting on Jan. 20 by the formation of the following sub-committees to consider the subjects assigned:

SUB-COMMITTEES

Ways and Means.—Whose duties it shall be to procure necessary funds for all purposes pertaining to the work of the committee and to supervise the expenditure thereof.

Statistics and Regulation.—Whose duties it shall be to procure and assemble data relative to street railways in other cities and the terms and conditions of the franchises under which they are operating.

Appraisals.—Whose duty it shall be to ascertain the present value of the properties of the Detroit United Railway in the City of Detroit, both tangible and intangible.

Cost of Service.—Whose duties it shall be to ascertain the cost of operating the lines of the Detroit United Railway in the City of Detroit, and to determine therefrom the average cost of carrying a passenger; and this committee to submit a special report on the history and condition of stocks, bonds and mortgages from their inception to the present time.

Legal.—Whose duty it shall be to consider and pass upon such legal matters as may come before the committee or sub-committees during the investigation.

Franchise.—Whose duty it shall be to examine the present franchises under which the Detroit United Railway is operating, the dates granted, the dates of expiration, what tracks covered, and the essential features of each franchise as to rate of fare, taxation, paving, etc.

Schedules.—Whose duty it shall be to examine the schedules of the Detroit United Railway to determine when and where the service is inadequate and to what extent said service can be improved.

Conference.—To confer with the Common Council on matters pertaining to the investigation and to arrange with the Detroit United Railway for procuring such information and data as may be required from time to time by the various committees.

Extensions and Rearrangement.—To ascertain what extensions of lines throughout the city are necessary and in what manner present trackage can be rearranged to provide adequate service and effect economy in operation.

Municipal Ownership.—Whose duty it shall be to consider the question of municipal ownership, whether by operation by the city or ownership of tracks only.

Taxation and Paving.—Whose duty it shall be to consider the most equitable method of taxation and to ascertain the amount expended by the City of Detroit for paving and repair on the tracks of the old Detroit Railway lines since their construction and what sum will be required to be expended by the city under the terms of the Detroit Railway franchise to put said tracks in good condition.

PURPOSE OF CREATION OF COMMITTEE

The purpose of Mayor Breitmeyer in appointing the committee was explained by him in a short address at the organization meeting, in which he said:

I have asked you gentlemen to undertake this investigation because of my firm belief that it is purely a business proposition, and that the greatest hope of settlement lies in approaching it on a business basis.

There are represented on this committee all kinds of business, and I hope and believe all shades of opinions on what will constitute the proper settlement of the street car question. The committee must be representative in character if it is to truly reflect the sentiment of our people, and the greatest good will come from your deliberations if men of different minds will discuss the matter fairly and fully. I ask of you but one thing, and that is that you all approach this question with minds sufficiently open so that your present opinion may be modified or strengthened as the case may be by what is developed during your sessions.

We cannot settle the street railway question by saying in advance this arbitrary price must be charged for fare or extension must necessarily be made. What Detroit wants and must have is a complete street railway system, adequate service and the least possible rate of fare which will yield an honest return to the operating street railway company upon an honest capitalization. Detroit has no money to pay interest on stock increases or bond issues which cannot be shown to have been honestly necessary in the upbuilding and carrying on of its street railway system. On the other hand, I do not believe that Detroit has any desire to refuse honest earnings to the dollar which has been honestly invested.

I ask you to remember that in approaching this question you are representing the whole people of the City of Detroit. They are with you in any progress made toward the settlement which means so much for the city, and I have confidence that when you have completed your labors the result will be one which will satisfy the whole people.

WORK OF THE COMMITTEE

Frank W. Eddy, a prominent merchant, is chairman of the committee, and its secretary is Paul C. Renaud. As indicated by the description of the activities to which the various sub-committees will devote themselves, the work outlined by the committee makes necessary an examination of the accounts of the Detroit United Railway to ascertain the cost of operation and the average cost of carrying a passenger and a careful appraisal of the property, tangible and intangible. The examination of the accounts of the company is being conducted by William D. Gridley. The appraisal is in course of preparation by Frederick T. Barcroft, consulting engineer. Every facility that would aid in the examination of the accounts and the valuation of the property has been afforded by the company.

The Committee of Fifty holds public meetings in the council chamber, open to the public, at which various aspects of the problem are discussed. At one of these meetings an address was made, as stated in a previous issue of the Electric Railway Journal, by Charles V. Weston, president of the South Side Elevated Railroad of Chicago. Mr. Weston discussed the points brought out in the two articles contributed by him in the issues of the Electric Railway Journal of Dec. 26, 1908, and Jan. 2, 1909, respectively, and also other features of the traction problem.

Mr. Weston said in discussing radical differences between British and American systems:

COMPARISON OF DETROIT AND BRITISH CITIES

Comparing the service in the United States and British cities, we will take your own city, Detroit, Leeds and Liverpool, England, and Glasgow, Scotland:

	Detroit. 1907.	Leeds. 1906-7.	Liverpool. 1906.	Glasgow. 1906-7.
Population	350,000	463,000	770,000	1,050,000
Miles single track	188	96.5	104	165.5
Population per mile of track	1,862	4,798	7,404	6,344

What do these figures indicate? They show that Leeds, England, with 25 per cent more population than Detroit, has only one-half as much street railway; that Liverpool, with more than double the population of your city, has 40 per cent less street-car track; they show that Glasgow, with three times the population of Detroit, possesses only 88 per cent as much street railway. These figures emphasize the projection of our street-car lines into new and undeveloped territory—relieving congestion in the city and giving the city worker a chance to live amid more healthful conditions. The population per mile of track in Detroit is approximately 1862; in Leeds, 4798; Liverpool, 7404; Glasgow, 6344. I am aware that the advocates of municipal ownership say that population per mile of track is no test of public or private ownership; that it merely indicates density of population. I contend that it indicates enterprise on the part of street railway managers in the United States which has no parallel in any European coun-

try—an enterprise which has not only made for the health and comfort of the people, but has vastly increased the wealth of the country and the revenue of the State by enormously enhancing real estate values; and that the indirect benefits to the common good represent vastly greater values than all the money that has ever been paid toward relieving rates by all the municipalized urban transportation enterprises in the world.

Moreover, the service supplied to the people of this country, by privately operated street railways, costs the users of that service less than is paid for poorer service by the people of European cities whether the facilities be privately or publicly operated.

Twenty-two British towns received the sum of $1,625,496 toward the relief of rates for the year included in statements published in June, 1908.

The city of Chicago received last year from its surface railways as its share of the net revenue earned under the new contract ordinances the sum of $1,600,000. In addition to this sum the companies paid taxes amounting to $640,000. The amount paid toward the public good by the railway companies of the city of Chicago for an equivalent period is much greater than the aggregate of the sums paid for a similar purpose by the municipalized operations of the 22 British towns which I have mentioned, irrespective of the fact that the population of these towns is considerably more than double the population of Chicago, and irrespective of the fact that the British people paid more per unit of service rendered than the Chicago people paid, which is a very strong indication that the blessings in privately operated public service utilities under proper regulation exceed those in municipalized undertakings of similar kind.

Besides the direct benefit to the common good from public service corporations in this country, we should not lose sight of the large sums which accrue to the State from taxes paid by holders of the capital stock of street railway companies, and when all these different elements are taken into consideration it will show that the net returns to public authorities in the United States are vastly greater from privately operated public utilities than they are in Great Britain from municipalized utilities. The conditions as they are to-day make a very favorable showing for the urban transportation facilities of the United States, when they are compared with those of the United Kingdom. But conditions in this country are susceptible of great improvement. In fact, there is a peril in the present general situation of urban transportation affairs in this country, a peril that has grown out of misunderstanding between the people and public service companies.

UNIFORM FARES

Mr. Weston also discussed the subject of uniform fares and the failure which German experience had proved them to be. He said in part on this subject:

The system of uniform fares in Germany has proved a failure. It has often involved considerable losses, and whenever the system has been extended it has been found necessary to replace uniform tariffs by graduated charges. In places where the uniform tariff is supposed to rule, it applies only to short hauls within town limits, extra charges being made for any extensions of the lines. Variable fares fixed by zones have given good results, because they permit an extension of the system without deranging the balance between receipts and expenses, it being possible to adjust the lengths of the sections according to the ruling conditions.

To illustrate to some extent the conditions which prevail in cities of Germany in regard to rates of tariff for street railway service, I quote the following from the operating statistics of several of the traffic systems in leading cities of Germany:

Dresden—Fare 10 pfg. (2.4 cts.), where the greatest distance of haul is 3.42 miles. Where a transfer is given the charge is 15 pfg. (3.6 cts.). For exterior lines the charges are 10 pfg. (2.4 cts.) for 1.87 miles; 15 pfg. (3.6 cts.) for distances up to 3.74 miles, and for distances up to 7.6 miles 20 pfg. (4.8 cts.) is charged.

Munich—With a population of 500,000 and a system containing 30 miles of track, the road was operated at a loss with a uniform fare of 10 pfg. (2.4 cts.) for any distance. The rates of fare were changed to a charge of 10 pfg. for short hauls within the city limits and 5 pfg. (1.2 cts.) for every 1800 meters (1.12 miles) outside of the 10 pfg. zone.

Düsseldorf—The road was operated at a loss with a 10 pfg. (2.4 cts.) fare for any distance, and the following rate tariff was adopted in place of the 10 pfg. uniform fare: 5 pfg. (1.2 cts.) for 1.37 miles, and 5 pfg. (1.2 cts.) for each 0.91 mile outside of the first 5 pfg. zone.

Cologne—The road pays 5 per cent on the investment and was formerly operated at a loss for 10 pfg. (2.4 cts.) fare for any distance. The rates of fare were changed to 10 pfg. (2.4 cts.) for 1.4 miles and 15 pfg. (3.6 cts.) for a ride over any part of the system, the average distance being 3.6 miles.

Mannheim—The road pays 3.4 per cent. The fares are 10 pfg. (2.4 cts.) for 1.3 miles; 15 pfg. (3.6 cts.) for 2.17 miles, and 20 pfg. (4.8 cts.) for any distance beyond. This is a very small system of railway, there being only about 10 miles of road.

Königsberg—Road was operated at a loss with a uniform fare of 10 pfg. (2.4 cts.) for any distance, and the charges were changed to 10 pfg. (2.4 cts.) for a distance of less than 2½ miles, and the same fare (10 pfg.) was charged for a distance of 1.55 miles outside of the limits of the first zone; 15 pfg. (3.6 cts.) is charged for a distance of 3.4 miles.

CHARGE OVER ONE CENT PER PASSENGER MILE

It will be seen from these data that the charges for the service in the cities of Germany are in excess of one cent per passenger mile.

It has been determined by experience in the operation of large urban transportation systems, not only of the United States, but of the world, that adequate service cannot be rendered, the physical property be maintained in good condition, fixed charges and depreciation be provided for, and a reasonable return earned upon the investment at an average rate of compensation less than one cent per passenger mile. Where a flat rate is charged, irrespective of the length of ride, transferring passengers has the effect of increasing the average distance of haul and of reducing the rate of fare per passenger.

W. D. MAHON AND A. B. DU PONT IN MOVEMENT FOR MUNICIPAL OWNERSHIP

One of the members of the Committee of Fifty is W. D. Mahon, president of the Amalgamated Association of Street & Electric Railway Employees of America. Mr. Mahon is also active in an independent committee which has been formed and is promoting a movement for municipal ownership of the Detroit lines. The movement for municipal ownership is supported by the Detroit *News*, one of the leading daily newspapers in the city. This paper has printed various interviews with A. B. du Pont, of Cleveland, bearing on the Detroit traction situation. To one of these interviews and a subsequent editorial published by the Detroit *News* a formal reply was made by J. C. Hutchins, president of the Detroit United Railway. The letter of Mr. Hutchins was as follows:

Having quoted A. B. du Pont the other day as saying that the physical properties of this company in Detroit, which were inventoried to be worth $7,806,737.42 10 years ago, have not been increased in value and are worth only about the same amount now, you, this morning, in commenting upon his statement, express the belief that it must be true because no officer of the company has challenged it.

I have preferred that a statement of all facts relating to this property shall come from the Committee of Fifty in connection with the pending investigation. But I am curious to know just how you would treat the following information:

The inventories Mr. du Pont refers to were taken at the beginning of the year 1899. They showed the value of the city lines to be about $16,000,000, of which amount $7,806,737 covered their physical value. These inventories,

taken at the beginning of the year, were based upon conditions as they existed at the end of the year 1898.

In the year 1898 there were carried on all of the Detroit city lines, including transfer passengers, a total of 55,378,918 passengers, of which number 44,197,122 were pay or revenue passengers. In the year 1908 there were carried on these lines a total of 148,840,835 passengers, an increase of nearly 100,000,000. Of these, 40,447,333 were carried as transfer or free passengers, being very nearly as many as were carried, all told, for pay in the year 1898.

You would hardly contend that these results could have been accomplished without some additional facilities. I would mention one item: Every electrical device in the power houses of this city, with the installation of which Mr. du Pont had anything to do, has been replaced since the year 1899 by machinery suitable for our present traffic conditions. And in meeting these traffic conditions every feature of the company's plant has required the expenditure of large sums of money.

Mr. du Pont and Mr. Johnson have paid us the compliment of saying in Detroit that it should not cost any more than $50,000 a mile to build and equip a street railway, and that any street railway capitalized in excess of that amount is capitalized on water, pure and simple. Their railway in Cleveland was turned over to what they call the "Government" at about $129,000 a mile. The compliment is an implied one, of course, meaning that we should be able to do as much with 30 cents as they are with $1.

I rather expect you or them to come back at me with the argument that we are crowding all of the added millions of passengers into the same old cars of 1898. But in view of the fact that most of our cars now in use are commodious double-truck cars, and there were none of that type in Detroit 10 years ago, this argument would hardly be fair. On this point possibly du Pont and Johnson, who testified in the Detroit courts that we should be required to operate cars 20 seconds apart, can tell you why in their efforts to avoid a loss of $1,000,000 in six months in their 3-cent experiment last year, they were justified in withdrawing from service about one-quarter of the cars which had been in use in Cleveland.

THE JOHN A. BRILL MEMORIAL MEDAL

In the fall of 1908 The J. G. Brill Company made public an offer to senior students of the technical schools of the United States of three prizes of $250, $150 and $100 for essays on the subject "Design of an Electric Railway Car for City Service." The company reports that the interest awakened in the contest among the students has been quite remarkable and that there is every evidence of a large number of essays being submitted before the contest closes on June 15, 1909. Electric railway officials have shown their approval of the contest, which is designed largely to draw more young men into electric railway work, and the American Street & Interurban Railway Association has manifested its interest by authorizing the president of the association to appoint one of its members, W. A. House, of Baltimore, on the jury of awards.

In view of all these circumstances and to make the prize award of more permanent value, James Rawle, president, The J. G. Brill Company, announces that the first prize will be accompanied by a gold medal in memory of John A. Brill, former vice-president of the Brill company.

It is the present intention of The J. G. Brill Company to offer annually prizes for essays of merit by senior students of the technical schools of the United States on subjects connected with electric railway work, and it has been thought fitting that Mr. Brill's mechanical ability and memory should be commemorated by a medal of permanent value which would be a source of inspiration to those upon whom the future development of electric railways may depend.

DISCUSSION ON SIDE-DOOR SUBWAY CARS IN NEW YORK

Frank Hedley, vice-president and general manager of the Interborough Rapid Transit Company, has filed with the Public Service Commission a statement of objections to the double end side door design of car recommended by Mr. Arnold. This statement is based on the performance of this car during the time that it was in use during February. Mr. Hedley says in part:

MR. HEDLEY'S STATEMENT

In Mr. Arnold's report on "The Subway Car," dated Feb. 18, 1908, he recommends that every car used in regular passenger service in the subway be provided with two additional side doors located near the ends, and gives the following reasons therefor:

First—The double door space at each end of the car will greatly reduce the present waits.

Second—The separate exits and entrances will remove the present uncomfortable conflict at the car doors.

Third—The present cars can be altered into this type of car without detracting from their structural strength or materially altering the present seating arrangement.

Fourth—The result in increased carrying capacity due to the changes will abundantly justify the investment.

Fifth—This is the only type of car with additional doors that will not materially increase the present trouble due to curved platforms.

As regards his first conclusion, a check covering the last eight days that this car was in service, and not taking into consideration the first four days so as to avoid the question of unfamiliarity of employees and passengers with this scheme, show that the average length of the station stop at the five limiting points on the line is greater with the side door train than with that of its leader or follower on practically even intervals. This, too, in spite of the fact that the side-door train is equipped with a buzzer that automatically indicates to the motorman when all car doors are closed. In the report mentioned above Mr. Arnold gives it as his opinion that a saving of five seconds per station stop could be effected by the introduction of this buzzer. Therefore, if the five seconds thus saved by the buzzer are added to the station stops of this train, the comparison with its leader and follower would be on a fair basis, and would show that the experiment not only disproved Mr. Arnold's conclusions, but that the station stops were materially longer.

Second—No fair-minded person could truthfully say, after riding on the side-door train during any one of the rush trips during the 12 days it was in service, that the conflict at the car doors was removed or materially lessened. In fact, there are points on the line, and limiting points, too, where there is practically no conflict, because the traffic is all embarking. At these points the new design does not increase the loading or unloading facilities at all; consequently, does not affect the length of the station wait.

Third—While the present cars may be altered to embody the changes recommended without detracting from their structural strength, they cannot be so altered except by the expenditure of a vast sum of money. What in the mind of the expert constitutes a material alteration of the seating arrangement is not known, but to my mind any change that will make it necessary to run 18 per cent more service during the non-rush hours and over 30 per cent more service during the rush hours to afford the same number of seats as is provided for by the present equipment is a material alteration, and should be seriously considered.

Fourth—This conclusion depends upon the accuracy of reason No. 1, and inasmuch as the experiment has conclusively shown that the results claimed for it were not borne out in practice, if No. 1 reason is wrong, No. 4 must necessarily be wrong also. Furthermore, for the sake of the argument, if it be granted that the results claimed in No. 1 could be obtained, Mr. Arnold, in reasoning that the alleged increased carrying capacity due to the recommended changes would justify the investment is based on the assumption that no additional men would be required for the operation of these additional doors. Frof Mr. Arnold's last report, received yesterday, advocating that handles be

placed on the outside of these doors, it is apparent that he has changed his opinion in this particular, and now considers it necessary that these car doors be operated by men on the station platform, which means a decided increase in the operating expenses. Further, Mr. Arnold states in his report that 90 seconds headway is the maximum rate at which the signal system between stations will allow trains to pass, and admits that with the present style of door we can and do maintain an average of 50 seconds as the maximum station stop. While our records show that our station stops average less than 50 seconds, using Mr. Arnold's figures for the sake of argument, and accepting his conclusions that the introduction of a buzzer would save five seconds per stop, this brings the station stop to 45 seconds. With the introduction of the speed control signal the time to enter and depart from a station is reduced to 45 seconds. This, added to the station wait of 45 seconds, gives a total of 90 seconds, or 1½ minutes, which is the closest headway, according to Mr. Arnold's testimony, that can be run with safety if the present high speed schedule is maintained.

Fifth—Failure to prove the advantages or the necessity of this special side-door car makes it unnecessary to consider the fifth reason, as Mr. Arnold admits that his car does increase the liability to accident at curved stations over the present type, but does not increase it as much as it is possible to do.

LENGTH OF STATION STOPS AND NUMBER OF ACCIDENTS

Mr. Hedley also filed with the commission a statement of the length of station stops made by this train from Feb. 20 to Feb. 27, inclusive, and the stops made by the train immediately preceding and following it. The comparison is shown in the table below, in which the special train is marked "special," the preceding train "leader," and the following train "follower." The figures given are the average length of stop in seconds during the 20 hours' run per day of each train, and are divided into north and southbound stops.

	Leader		Special		Follower	
	S.B.	N.B.	S.B.	N.B.	S.B.	N.B.
Feb. 20	31	30	37	37	32	24
Feb. 21	31	30	27	32	28	28
Feb. 22	27	31	34	34	32	36
Feb. 23	29	29	40	36	31	32
Feb. 24	30	32	33	31	31	29
Feb. 25	28	29	32	36*	28	30
Feb. 26	33	29	31	31	28	29
Feb. 27	33	* 34	36	34	31	29

A statement was also filed showing the time lost by the special train and its leader and follower from Feb. 16 to 27, inclusive. This statement showed that the average time lost per trip by the special train over the leader was two seconds, and over the follower was 1 2/12 seconds. The following statement was also filed of the accidents and unusual occurrences on this train during the time that it was in use:

During the 12 days that the side-door train was in operation, making 85 round trips or 170 single trips, an equivalent to 1360 car trips, a total of 28 accidents and unusual occurrences were observed. Our schedule calls for an average of about 10,500 car trips daily, and on this basis, if the same percentage of accidents held true, and if all our cars were equipped with side doors, we would have over 210 accidents and unusual occurrences per day, instead of six or seven as at present.

POSITION OF PRESIDENT SHONTS

The position of the Interborough Rapid Transit Company in regard to the side doors has been outlined by President Shonts in an interview early this week, as follows:

During the construction of New York subway, and when it was nearing completion, ready for operation, it was the only subway anywhere in the world that would have the density of traffic that has since been noted on the New York subway, and the Interborough Company employed engineers for the purpose of designing its equipment. At the time the equipment was designed and placed in operation it was supposed to be the most up-to-date development in the world in the art of car building. The complete designs were submitted to the engineers of the Rapid Transit Commission and approved by them. The passenger business in the New York subway increased so rapidly immediately after the road was placed in operation that there was considerable unpleasant conflict between passengers boarding and alighting from the cars. As soon as this was apparent the Interborough Company proceeded immediately to make the doors in the end of the cars much larger, and on 500 of its cars it removed entirely the bulkhead doors, in order to make ingress and egress more convenient.

I never have been opposed to some kind of a side-door car for subway work, and in this opinion I find the officers of the operating department concur. However, it is unfortunate that New York subway was built with so many of its passenger stations on bad curves. This is especially the case with the local tracks.

I am of the opinion, and it is still the opinion of our operating department, that center side doors can be operated on the express tracks in New York subway. In fact, prior to the present law which created the Public Service Commission, our operating department requested authority from the company's board of directors to construct 50 cars in such a way so that center side doors could be readily installed. These 50 cars were constructed, but the side doors were not installed, because during the construction of these cars the present Public Service Commission had been created by law and taken office, and had taken up the question of installing side doors in the subway cars. The commission employed Bion J. Arnold as its special consulting engineer, to make a report on side-door cars for the city's subway. Mr. Arnold filed his report under date of Feb. 18, 1908. In this report he describes several types of cars with side doors, among them the center side-door cars, and gives the reasons why, in his opinion, a car of this design for the present subway would be impracticable.

Shortly after Mr. Arnold made his report to the commission, which is above referred to, the latter commenced to hold public hearings. In the conclusions of the report, Mr. Arnold recommended only one type of car for the subway service, and this was a type of car with two extra side doors in each side of each car, near the end. Our operating department very thoroughly studied this type of car, and, as a matter of fact, it was presented to them prior to Mr. Arnold's being appointed by the commission—in fact, before the Public Service Commission was created by law. And, as a matter of fact, the design for the type of car recommended by Mr. Arnold and ordered tried by the Public Service Commission was designed and patented by one of this company's engineers a year or more before the Public Service Commission was created by law. This particular type of car, with two end side doors, was not considered by the operating department of this company as an improvement.

Mr. Arnold, in his report to the commission, stated that the center side-door car would be impracticable for the New York subway, and in this opinion our operating department concur; but our operating department is still of the opinion that this center side-door car will be an improvement on the express tracks of the city's subway only.

The public hearings by the Public Service Commission on side doors in subway cars were held, I think, during the financial panic, and it was a financial impossibility for this company at that time to make any large expenditures on this equipment or otherwise. However, we were ordered by the Public Service Commission to build 16 of our subway cars with end doors, and the commission later agreed that we could build eight of these cars first. This has been done, and the cars have been given a practical test in the subway. From the records, which were made by representatives of Mr. Arnold to the Public Service Commission, copies of which were obtained by this company last Friday, it is proved conclusively that, according to Mr. Arnold and the figures obtained by the commission, the car is a failure and does not possess the ability to get over the road as rapidly as our present standard equipment. Mr. Arnold, three days after this train was placed in operation, wrote to our operating department a letter suggesting several changes, which he termed "improvements or betterments." Some of the changes referred to by Mr. Arnold our oper-

ating department declined to make, because it would introduce positive dangers, which certainly would involve personal injuries to the traveling public. When these points were pointed out to Mr. Arnold, he concurred with our operating department, that some of them could not be made. However, the changes that Mr. Arnold agreed with our operating department should be made were made, and the cars are now standing in the yard awaiting the orders of the Public Service Commission. Our operating department has already advised the Public Service Commission that they will not restore the cars to the service without a direct order from the commission, because it is their opinion that the public of New York are much safer with that particular train lying idle in the shops than they are when it is on the road.

The financial panic has blown over, and the Interborough Company now has in its shops eight of the 50 steel cars above referred to, which were constructed so that center side doors could be installed, and these center side doors are now being installed in these cars. Our operating department has notified the commission that this is being done. These cars will be ready for practical test on the road in about two weeks, and provided the operating department is permitted to operate them in the best possible manner in order to obtain the maximum efficiency from them, it is of the opinion that these center side doors on the express tracks will be an improvement over our present equipment.

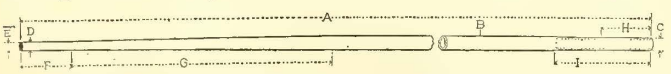
Of course, the degree of improvement is yet to be determined. They may, and we believe they will, be a slight improvement, but whether they will be a sufficient improvement to warrant the Interborough Company in making the financial outlay that it will have to make in order to put in these center side doors can only be determined after a practical test has been made.

THE POSITION OF THE COMMISSION

The position of the commission, as indicated at a hearing held April 6, is that it is anxious to have the question of side doors settled soon, because, owing to the changes to be made in the subway under the direction of the commission, its capacity will be considerably increased. This will require additional cars, if the subway is to be utilized to its maximum capacity in the fall, when the usual increase in traffic occurs. According to testimony given by officials of the company, it will take four months after these cars are ordered before they will be delivered, and if the cars are to be ready by Sept. 15 it is very important to determine the proper type of car by May 15. In consequence, the commission has declined the application of the Interborough Rapid Transit Company for a 60 days' extension from April 5 of the order requiring the company to build over the second train so as to furnish side doors near the end of the car, and has limited the extension to 30 days.

REINFORCED TROLLEY POLES

The point of greatest bending strain in a trolley pole is just outside the socket of the trolley base. The Pittsburgh Pole & Forge Company, Pittsburgh, Pa., has recently put on the market a design of pole heavily reinforced at this point by the insertion of a section of tubing of the same gage as the pole itself and 20 in. to 30 in. long, which is swedged into the pole at the bottom so as to form prac-



Proportions of Reinforced Trolley Pole

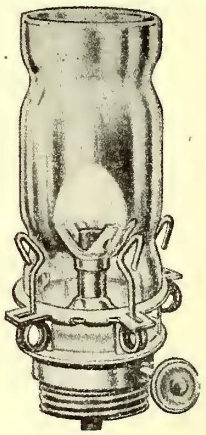
tically a weld. Comparative tests with 14-ft. plain and reinforced poles made of butt welded tubing 1.66 in. outside diameter held at the bottom end and weighted at the harp end show a large increase in bending strength in favor of the reinforced design. The maximum weight applied to the plain pole without permanent set was 50 lb., with a total deflection of 16 in. The reinforced pole under a weight of 55 lb. deflected only 14 in. The weight of a pole reinforced in this manner is only 1 lb. more than a plain pole. The dimensions of a 14-ft. pole as shown by the accompanying drawing are as follows: *A*, 14 ft.; *B*, 1.66 in.; *C*, 1½ in.; *D*, 1 in.; *E*, 49/64 in.; *F*, 6 in.; *G*, 30 in.; *H*, 12 in.; *I*, 24 in. The poles are made in lengths varying by 6 in. from 12 ft. to 15 ft.

WARNER TRUCKS IN THIS COUNTRY

H. F. Vogel, of the St. Louis Car Company, has been appointed United States agent for the Warner Engineering Company, Ltd., of London, and has just completed arrangements by which the St. Louis Car Company will be the sole licensee for the manufacture of trucks built according to the Warner trajectory system, using non-parallel axles. Warner trucks are in successful use on a number of lines in Great Britain and on the Continent of Europe, and differ in principle from the so-called radial trucks. Among the advantages claimed for them are that they reduce the wear on the rails and wheels; they give greater comfort in riding, and that on both straight track and curves the direction of movement of the car much more closely approximates the ideal line than in the case of a car mounted on trucks with rigidly parallel axles.

FLAT FLAME SIGNAL LAMP

The Adams & Westlake Company, pioneer manufacturer of long-time burners for switch and semaphore signal lamps, has recently placed on the market an improved long-time burner lamp of the non-sweating balanced-draught type which has a flat flame and is known as No. 51. This lamp was designed to meet the demand for a long-time burner with a flame which would give a greater diffusion to the projected signals than the round-flame burner which has been in general use. The spread of the flame is approximately 9/16 in., and it burns with an intense whiteness, so that excellent results are obtained and at the same time the increased oil consumption, due to the larger flame, is not sufficient to cause any change in the method or routine of filling and tending lamps. This new burner, combined with a center core wick, insures satisfactory service.



Flat Flame Signal Lamp

THE PHILADELPHIA RAIL CORRUGATION GRINDER

Announcement is made by William D. Gherky, of Philadelphia, that he is prepared to contract for the removal of rail corrugations on any system by means of the Nichols rail corrugation grinder, described in the April 3 issue of the Electric Railway Journal. For this purpose he will have available the necessary number of machines and workmen to carry out a contract as quickly as possible. By this method the street railway companies will be spared the expense and annoyance of purchasing and handling unfamiliar machinery, as the work will be done entirely by specialists under conditions as prescribed by the customer. Mr. Gherky now has six machines nearing completion.

News of Electric Railways

Plans for Interurban Station and New Franchise at Columbus, Ohio

With the introduction of four ordinances in the City Council of Columbus, Ohio, last week, the plans of the Ohio Electric Railway for a new interurban station in that city are disclosed. They are much more extensive than was at first reported, and include a freight station and a union interurban station for both freight and passenger purposes to cost with the necessary sidings, spurs and additional track more than $400,000.

The proposal of the company is based on concessions asked from the city, viz., that the company be allowed to abandon the present interurban loop which requires about 30 minutes to traverse, and that it be given permission to lay T-rails within the city. Under a suspension of rules the ordinances were given their second reading and then referred to the committee on railroads and viaducts, where they will remain pending a public meeting to be called to learn the sentiment of the people.

The first ordinance provides for the grant of a blanket franchise that will substitute the franchises under which the four separate lines constituting the Ohio Electric Railway in Columbus now operate, and extend the life of these franchises seven years. The blanket franchise is for 25 years and provides for the construction and operation of new lines on streets not now occupied. The four individual lines covered by the ordinance are: The Columbus, London & Springfield Railway, the Columbus, Grove City & Southwestern Railway, the Columbus, Buckeye Lake & Newark Traction Company, and the Columbus, Newark & Zanesville Electric Railway. The first ordinance further provides that an interurban station to cost not less than $300,000 shall be built on South Third Street, extending from Town Street to Rich Street, west on Town Street 171.87 ft. and west on Rich Street 212.5 ft. The station and tracks are to be completed within three years after the granting of the franchises. The company is not to be required to operate over the present loop and is to be allowed to lay 7-in. T-rails weighing 90 lb. The franchise also provides for 5-cent cash fares within the city and for seven tickets for 25 cents. Two per cent of the earnings from city fares is to be paid the city and the city auditor is to have access to the company's books. Should the company be required at any time to sell eight tickets for 25 cents, it is to discontinue the payment of the 2 per cent to the city. Provision is made for the use of the interurban station by other companies on terms to be mutually agreed upon or submitted to arbitration. The cars are to be limited to a maximum speed of 12 miles per hour within the city limits and the company is to grade unimproved streets.

The second ordinance provides for the laying of tracks by the company on Town Street from Scioto Street, where the cars of the Columbus, London & Springfield Railway enter the loop to Third Street or the north end of the proposed station. This is to be a cut-off and will enable the company to secure entrance to the city without passing around the long loop.

The third ordinance provides for the vacation of a portion of Walnut Street over which the proposed station is to be built, and the fourth ordinance gives the company the right to construct a spur from Rich Street along the west side of the station site for the handling of material.

The foundation of the new station is to be so constructed as to accommodate seven stories, although at the present time it is the intention to build only two stories. The structure proper is to be of brick and stone.

Extension of Hudson & Manhattan Railroad Approved

The Public Service Commission of the First District of New York approved the proposal on April 1 of the Hudson & Manhattan Railroad, which operates under the Hudson River between New Jersey and New York, to extend its line from Thirty-third Street and Broadway, New York, to the Grand Central Station. The commission received from a sub-committee, consisting of Chairman Willcox and Commissioner Maltbie, a report on the character and location of the route and directed its counsel to prepare a certificate and order of notice for a hearing on April 21, at which the matter will be finally adopted. The report of the sub-committee declares that as the result of conferences with the engineers of the Hudson & Manhattan Railroad it is convinced that the proposed route can be constructed so as not to interfere with any tunnels that may be built in the future. The report of the sub-committee outlines the course of the Hudson & Manhattan Railroad extension—from Thirty-third Street and Broadway up Sixth Avenue and around into Forty-second Street, with an easy curve under Bryant Park, so as to take an easterly direction at a point midway between Sixth and Fifth Avenues. The Hudson & Manhattan Railroad, with two tracks, will be located on the south side of Forty-second Street, passing under Fifth and Madison Avenues on the third level, or two levels below the present subway, and then coming into its terminal station at Grand Central on the level below the present subway and between it and the station of the Steinway tunnel to Long Island City. The station of the Hudson & Manhattan Railroad will extend from the westerly side of Park Avenue to the westerly side of Lexington Avenue, and will afford connections with the present subway, the Steinway tunnel and the Grand Central Station. The route is planned so as to have stations at Forty-second Street and Fifth Avenue and at Thirty-ninth Street and Sixth Avenue. In conclusion the report says that the committee considers the plan of the Hudson & Manhattan Railroad desirable for the reason that it will afford connections from the Grand Central Station, the proposed Broadway-Lexington Avenue Subway, the present subway, and the Steinway tunnel with all parts of Sixth Avenue and with all of the New Jersey terminals of steam roads.

Discussion on Depreciation in Report of Philadelphia Committee

The report of the special committee of Councils of Philadelphia, which investigated the street railway situation in various large cities, contains a short discussion regarding depreciation and amortization by F. W. Brooks, general manager, Detroit United Railway. The discussion in the report regarding the abuse of transfers was published in the Electric Railway Journal of April 3, 1909, page 663.

One of the formal questions submitted by the committee was as follows:

"What would you consider a fair proportion of the actual replacement cost of the system; that is to say, of the track, overhead work, rolling stock, power plants and appurtenances, to be set aside each year in addition to ordinary expenses for maintenance, in order to provide a fund for replacing the system when it became worn out or antiquated, in case no new capital was available for those requirements?" The report adds:

"None of the companies answered this question specifically. Mr. Brooks, of Detroit, discussed the question at some length, and in the course of his discussion said: 'It is a great big question. I can see that if any city in America had required its transportation company to earn sufficient money within its life as determined by these franchises, then certainly the people of that city would have an enormous burden to bear; and whether it is proper to say that these properties shall be corrected and shall earn that cost and their replacement out of the pockets of one generation or several generations is a problem that the wisest men have stumbled over.'

"In speaking of the practice of his company, Mr. Brooks said: 'We are charging off every year to depreciation something like $250,000. We are doing it on the theory that the entire property will not have to be reproduced at one time; we had hoped to meet any reasonable situation, replacing any cars that got out of condition each year, more as a matter of maintenance and replacement than as a matter of reproduction. Now, the thought in my mind was that if you say to a transportation company in the city, "You construct this plant and operate it for 30 years, and at the end of 30 years there shall not be one dollar owed by this company, discharge all bonds, mortgages, etc.," then I say that you have done a thing that amounts to confiscation so far as the public at large is concerned.'"

Illinois Central Railroad Electrification

Edward H. Harriman passed through Chicago on March 31 on his way from California to New York on business. Although he was in Chicago only a short while, Mr. Harriman consented to be interviewed. He is quoted as saying that the talk about his retiring is not worth denying. Mr. Harriman discussed the railroad situation in general. He said he had been misquoted in Denver, and carefully explained his attitude toward consolidations. He said that

business in the West is improving steadily. Regarding the local situation at Chieago, Mr. Harriman was quoted as saying:

"I have just had a long talk with J. T. Harahan, president of the Illinois Central Railroad, and from the preliminary reports I should say that if the city would pay half the cost of electrifieation we might want to do it, but we do not want to 'bust' the Illinois Central Railroad. We have only the preliminary reports here, but has the electrifieation of the New York Central & Hudson River Railroad proved a complete success? That is not finished by a good deal, and the situation there is different. The company had to electrify on aceount of the tunnel, but there is no tunnel in Chicago. I do not want to talk against eleetrification. Luxuries come high, but I suppose we will have to have them."

President Harahan is reported to have made the following statement regarding electrification at a subsequent conferenee with the city authorities: "It is a gigantic undertaking and we are still making a study of the question. When eonclusions will be reaehed eannot be foreeast at this time, but electrifieation of the eompany's traeks along the lake front, it would appear, will eventually be earried out. We had to make a beginning somewhere, so numerous plans have been drawn for the eleetrifieation of the traeks used by the company for Chieago suburban serviee. The estimated cost is $8,000,000. Several times that amount will be needed for electrifying all the lake-front traeks. All details must be carefully considered before any electrifieation work is begun."

The plans now being discussed provide for placing all suburban track in one seetion of the right of way along the lake front where there will be no interferenee from through trains. It is estimated that the traek ehanges alone will cost $1,500,000. A report that the Illinois Central Railroad would request permission to build a subway loop through the business district of Chicago for the aceommodation of trains of its own eleetrified divisions and trains of other electrified steam railroads is said to have been a misstatement. It is learned that the Illinois Central Railroad merely asked permission to use part or all of the eity's proposed subway as the downtown terminal of its electrified suburban serviee if a subway system is built in Chicago.

Joint Meeting of Western Associations

A joint meeting of the Wiseonsin Electric & Interurban Railway Asseciation, the Fox River Valley Gas & Electric Association and the Northwestern Electrical Association will be held in the Hotel Foeste, Sheboygan, Wis., on April 12 and 13. This meeting will be devoted to the eonsideration and discussion of the new aceounting system prescribed by the Railroad Commission of Wisconsin. The program as announced follows:

MONDAY, APRIL 12.

Meeting called to order at 1:30 p. m.

Opening remarks by Clement C. Smith, president Wisconsin Electric & Interurban Railway Association.

Remarks by Ernest Gonzenbach, president Northwestern Electrical Association.

Paper, "The New Accounting System," by Halford Erickson or William J. Hagenah, of the Wisconsin Railroad Commission.

Paper, "The Practical Application of the New Accounting System," by George Allison, Wisconsin Electric Railway and Eastern Wisconsin Railway & Light Company.

Paper. "Methods of Changing from the Old to the New," by B. G. Broad, Milwaukee Northern Railway.

7:00—Dutch supper.

TUESDAY, APRIL 13.

Visit to the power station of the Sheboygan Light, Power & Railway Company.

Visit to the loading and sorting docks of the C. Reiss Coal Company.

Visit to Born's natural mineral water baths.

Adjournment at 12:00 noon.

Municipal Ownership Recommended at Middletown, Ohio.—The Business Men's Club of Middletown, Ohio, has recommended that the town purchase the horse car line, whieh is owned by the Cincinnati, Hamilton & Dayton Railroad, and equip it for operation by electricity.

New York, New Haven & Hartford Railroad to Extend Electric Lines.—It is reported that the New York, New Haven & Hartford Railroad has had preliminary plans drawn for the electrification of that division of the road between Stamford and New Haven, Conn., and the construction of an additional power house at Naugatuck Junction, where a site has been secured. At the offices of Westinghouse, Church, Kerr & Company, the engineers who constructed the power house at Cos Cob, Conn., it was said that no instruetions to prepare plans had been given that firm by tthe railroad eompany.

Annual Banquet of Boston Suburban Railway Club.—The annual early morning meeting of the Boston Suburban Railway Club was held in Endicott Hall, Waltham, on March 30. A banquet was served at 1:30 a. m., followed by a varied entertainment. Employees of the street railways eentering in the Waltham and Newton distriets attended. William Scamman, president of the club, was in the chair. Among the guests were Mayor Walker, of Waltham; M. C. Brush, viee-president and general manager of the Boston Suburban Electric Companies; C. A. Sylvester, assistant general manager of the Boston Suburban Electric Companies, and Carl Alberte, manager of Norumbega Park.

Plans for Lengthening Subway Stations in New York.—The Public Serviee Commission of the First District of New York has referred to its chief engineer, the plans submitted by the Interborough Rapid Transit Company for lengthening the platforms of the stations in the New York subway. The company suggested that the service in the subway eould be inereased 25 per eent if the express platforms were lengthened so as to accommodate 10-car trains and the local platforms lengthened to accommodate 6-car trains. This was made a part of the proposition for the extension of the subway north on the east side and south on the west side, but the commission, without passing upon these extensions, suggested that the stations might be lengthened at once. The cost of lengthening the platforms, which would be paid by the eity, is estimated at about $1,000,000.

Cambridge Subway Station Plans Finally Approved.—Walter C. Wardwell, Mayor of Cambridge, Mass., has approved the plans of the Boston Elevated Railway for the stations to be built in the new Cambridge subway by the company at Central Square and Kendall Square. The Harvard Square plans were recently approved by the Massachusetts Railroad Commission. The Boston Elevated Railway has modified the plan of the Central Square station in aceordanee with the suggestions of the commission, and there will be no struetures in the highway there, the approaches and exits being on the sidewalk. All the entranees and exits will accommodate passengers in either direction who desire to transfer between the subway trains and the surface line eonneeting with them. The station planned at Sixth Street has been eliminated and instead, a station has been laid out for Kendall Square, with hood entrances and exits. A surfaee car loop will be installed there eonnecting with the station. It is expected that the Boston Elevated Railway will ask for bids for the construction of the subway in the near future.

Southwestern Electrical & Gas Association.—A meeting of the executive committee of the Southwestern Electrical & Gas Association was held at Dallas, Tex., on March 16. The following members were present: R. B. Stitcher, Dallas; W. B. Tuttle, San Antonio; A. E. Judge, Tyler; N. B. Head, Stephenville; H. T. Edgar, Fort Worth, and E. L. Wells, Jr., Marshall. Applications for membership in the association were received from the following companies and approved by the executive committee, subject to election at the next meeting of the association: Active members: Commerce (Tex.) Electric Light Company; Texas Traction Company, Dallas, Tex.; Gainesville Gas & Electric Company, Gainesville, Tex.; San Antonio (Tex.) Traction Company; Abilene Gas Light, Fuel & Power Company, Abilene, Tex.; Texarkana Gas & Electric Company, Texarkana, Tex.; Stephenville Light & Water Company, Stephenville, Tex.; Alvarado Water, Light & Power Company, Alvarado, Tex. Associate members: Houston (Tex.) Armature Works; Texas Company (Natl. Gas Dept.), Fort Worth, Tex.; The Emerson Electric Manufacturing Company, St. Louis, Mo.; Cutler-Hammer Manufacturing Company, Milwaukee, Wis.; Detroit Stove Works, Chicago, Ill.; Milton Mills, St. Louis, Mo. The office of secretary of the association was declared vacant. It was decided to include advance copies of the question box in the souvenir program of the association and to print a sufficient number of copies of the question box to bind them with the proceedings of the 1909 convention, the date of which is set for May 20, 21 and 22 at Dallas. It was deeided to notify the Electrieal Contractors' Assoeiation of Texas that the by-laws of the Southwestern Electrical & Gas Association would not admit the association to issue one membership in the Southwestern Association to any other association, but that applications would be received separately and the Southwestern Association would be glad to have the Electrical Contractors' Association meet at the same time as the Southwestern Association and in the same city. The report of A. E. Judge, treasurer of the association, showed receipts of $3,170.41 and disbursements of $1,993.29, leaving a balance of $1,177.12.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

Massachusetts.—The committee on metropolitan affairs has voted in executive session to report that all the bills providing for an extension of the subway and tunnel systems of the Boston Elevated Railway shall be referred to the Boston Transit Commission and the Massachusetts Railroad Commission sitting jointly. The principal measures included in this vote are the bill for a subway from Tremont and Park Streets to Milton Lower Mills; a bill for a tunnel between Sullivan Square and the North Station; a bill for a tunnel between Boston and Chelsea; a bill for rapid transit in Boston by a crosstown tunnel; a bill to discontinue the elevated structure in Washington Street and extend the Washington Street tunnel to Dudley Street, and a bill for a subway to South Boston. The same committee has reported leave to withdraw on the bill accompanying the petition of John D. Bryant and others to provide that the Boston terminus of the Cambridge subway shall be in Scollay Square. The House has adopted an order providing for an investigation by the Boston Transit Commission and the Massachusetts Railroad Commission and a report before May 1 on the advisability of granting the petition for legislation to authorize the Boston & Eastern Electric Railroad to construct a tunnel under Boston Harbor and connect it with the existing tunnel system in Boston. The Boston & Eastern Electric Railroad has submitted a new bill which provides that the city of Boston may purchase the tunnel on completion at cost, or, if it prefers, it may receive the tunnel free of cost at the end of 40 years, through the establishment of a sinking fund by the company. The committee on taxation has reported leave to withdraw on the Dean bill, providing that the poles and wires of any corporation located in the public streets might be taxed in the city or town where located, by the local assessors, the tax being deducted from the franchise tax levied by the tax commissioner for the State. The Haigis bill relative to the distribution of the franchise taxes of public service corporations has been referred to the next Legislature.

Minnesota.—The House committee of the whole recently recommended for passage the Nolan bill placing the street railways under the jurisdiction of the Railroad and Warehouse Commission. Subsequently the House referred the bill to the judiciary committee, with orders to give hearings and amend the bill if necessary, and to express an opinion as to whether it abridges the authority of cities over the companies. The measure was to have been reported back to the House on March 20, but there was no session on that date. At first the committee agreed on a compromise, which would leave primary jurisdiction with the cities and gave a right of appeal to the Railroad and Warehouse Commission. But in going over the constitution and court decisions so many legal entanglements were found that the committee was unable to draw a measure that would be constitutional. A bill somewhat similar to the Nolan measure has been introduced in the House by W. D. Washburn, Minneapolis. It places the supervision of suburban and interurban electric railways under the Railroad and Warehouse Commission and gives the commission power to order connections to be made between suburban and city railways or to provide for the transfer of passengers between such lines. The bill providing that cities of not less than 10,000 inhabitants and not more than 20,000 inhabitants shall be governed by commission has been received favorably, and the Senate and the House recently concurred in extending invitations to several members of the City Commission of Des Moines, Ia., to address them on the results attained under commission government in Des Moines. March 31 was the last day for the introduction of new measures in the House, and at the close of the session for that day the measures presented totaled 1173. One of the last measures presented gives the Governor power to appoint members of the Railroad and Warehouse Commission.

New York.—The prospects are that the Legislature will adjourn sine die on April 30, and that an extraordinary session will be called in May. There was another conference in New York on April 1 between the Governor and members of the Public Service Commission of the First District, but other than to admit, as they did in the case of the previous conference, that rapid transit legislation was discussed, the parties to the conference refused to be interviewed or quoted. The Public Service Commission for the First District has transmitted to the Assembly its report upon the Eleventh Avenue franchise of the New York Central & Hudson River Railroad in New York City. Beyond developing the fact that the company's legal rights to occupy the premises are apparently in some respects subject to question, the commission does not attempt to pass judgment upon them, nor does it suggest any plan of action looking to the forfeiture thereof. The commission cites the declaration of the company that public safety and convenience require the removal of the tracks from grade, and declares that the solution of the west side track problem must have a relation to the general betterment of freight distribution in the entire city, and especially in the Borough of Manhattan. Whatever the plan adopted, it appears probable to the commission that it must be carried out with private capital. Senator Grady subsequently introduced a bill granting the New York Central & Hudson River Railroad a franchise in perpetuity for an elevated structure south of Fifty-ninth Street, either in Eleventh Avenue or some other location. On April 5 Senator Brough introduced a bill regarding the line in Eleventh Avenue, New York. His measure proposes that the New York Central & Hudson River Railroad shall place its tracks now on that street in a subway, and gives the Public Service Commission authority to require the removal of condemned tracks. Assemblyman Bohan introduced the measure in the Assembly. The railroad committee of the Assembly has reported favorably the resolution introduced by Assemblyman Toombs, calling upon the Public Service Commission of the First District to order the building of a subway station at Columbus Avenue and 104th Street. A rapid transit measure affecting New York City was introduced concurrently in the Assembly and the Senate on April 7, which is understood to have been drawn in accordance with the wishes of the Public Service Commission of the First District and to meet objections which caused the Governor to veto a similar measure last year. The bill provides that private capital may construct, own and operate subways in New York, but that the profits shall be divided with the city, share and share alike, and that the city shall ultimately own the line without payment after a period suitable for realization of the cost. It is further provided that the city can at any time terminate any franchise or operating contract by making fair payment exclusive of franchise value. The bill also makes provision for the construction of rapid transit lines in the outlying districts, with the payment of at least a portion of the cost by local assessment upon the area benefited, and permits the construction, ownership and operation by private parties of extensions of established lines, these extensions to be subject to purchase by the city at any time after 10 years. Construction contracts may be made on the unit system and the section system. The bill has been referred to the cities committee in the Senate.

Pennsylvania.—The House has passed finally the measure introduced by Mr. Reynolds, empowering Philadelphia to borrow money for the construction of subways. The Senate has concurred in the House action, and it is believed that the Governor will approve the resolution. By the provision of this amendment the city will be empowered to issue bonds for the construction of a subway on Broad Street, and possibly other lines on Ridge Avenue and Front Street, which can be utilized by the Philadelphia Rapid Transit Company. The lease charges must be sufficient to pay the interest upon the bonds and to provide a sinking fund for the ultimate cancellation of the indebtedness. Philadelphia is the only city in which private interests have built a subway without aid from the city, and the purpose of the Reynolds constitutional amendment is to extend the service to North and South Philadelphia, Manayunk and Frankford. The amendment will have to be passed at two sessions of the Legislature and then submitted to a popular vote before it becomes effective. This will require at least three years. Following an agreement between Pittsburgh city officials and leaders of the Senate the Murphy bill, which permits the interchange of cars between steam and electric railways, has been amended in the Senate to prohibit the use of steam locomotives upon electric railways in such interchange of cars. The Shields bill, the companion measure, will also be amended to conform to the wishes of the Pittsburgh authorities. These bills were up for final passage in the Senate on March 25. The Shields bill authorizes the transportation of all kinds of freight by any power over electric railways. This legislation is said to be desired by the Philadelphia Rapid Transit Company, which plans to haul freight over its subway line. It was stated by Senator Vare that the hauling of ashes by trolley in Philadelphia had proved so satisfactory that the capacity of the ash cars would be increased shortly. Mayor Guthrie's principal objection to the bill as affecting Pittsburgh was that the amendment empowering Councils to sanction the connection of steam and electric railways did not fully protect the city's interests. The Shields bill is favored by the Pennsylvania Street Railway Association. It places the hauling of freight on electric railways under local regulation. The House has passed finally the Senate bill authorizing the acquisition by the State for the use of counties of bridges more than 1000 ft. long which are erected over creeks and streams by companies and the bill requiring street railways to carry United States mail upon demand.

Financial and Corporate

New York Stock and Money Markets

April 6, 1909.

Following a week of buoyancy and advancing prices the Wall Street market to-day had a slight reaction, which has been attributed entirely to profit taking on the part of small traders. Like so many of the recent movements on the Stock Exchange, the selling was commenced in London. The recent upward trend was started by the buying of the foreigners when prices seemed low, and the first pause was caused by foreign profit taking. The traction stocks during the last week have continued to be unusually active and substantial gains have been recorded.

The bond market continues to be firm, with plenty of investment buyers always ready to take well-secured issues. Money remains very cheap and plentiful. Rates to-day were: Call loans, 1½ to 2 per cent; 90-day loans, 2½ per cent.

Other Markets

Traction shares continued to be among the active features of the Philadelphia market, with Rapid Transit and Union Traction the leaders in popularity. The former was especially active and the price has been worked upward steadily until sales were made at 30¼. Union Traction, too, advanced steadily and touched 55¾, the highest figure since last spring.

In the Chicago market little interest has been shown in traction securities. City Railways, Series 2, is the only issue of that company that has been in the market, and this only to a limited extent. Subway has been less active, but quotations have not receded.

A trifle more interest has been shown in traction securities in the Boston market during the last week. Boston Elevated, Boston Suburban preferred and Massachusetts Electric have all been more active and prices have advanced somewhat.

In Baltimore, the bonds of the United Railways Company continued to be in demand. Prices were about stationary; incomes, 54¾ and funding 5s, 79⅝.

	Mar. 30.	Apr. 6.
American Railways Company	*45¾	*45¾
Aurora, Elgin & Chicago Railroad (common)	—	a37½
Aurora, Elgin & Chicago Railroad (preferred)	—	a88¼
Boston Elevated Railway	129	130½
Boston & Suburban Electric Companies (common)	—	*16
Boston & Suburban Electric Companies (preferred)	—	*70¼
Boston & Worcester Electric Companies (common)	—	*a11½
Boston & Worcester Electric Companies (preferred)	—	*a56
Brooklyn Rapid Transit Company	76¼	76½
Brooklyn Rapid Transit Company, 1st ref. conv. 4s	—	85
Capital Traction Company, Washington		*a133⅛
Chicago City Railway	*185	*a185
Chicago & Oak Park Elevated Railroad (common)	—	*a4½
Chicago & Oak Park Elevated Railroad (preferred)	—	*a11
Chicago Railways, ptcptg. ctf. 1	—	*a112
Chicago Railways, ptcptg. ctf. 2	—	*a41
Chicago Railways, ptcptg. ctf. 3	—	*a29
Chicago Railways, ptcptg. ctf. 4	—	*a11½
Consolidated Traction Company of New Jersey	a77½	a67½
Consolidated Traction Company of New Jersey, 5 per cent bonds	a106	a106
Detroit United Railway	*61	58½
General Electric Company	—	158¾
Georgia Railway & Electric Company (common)	—	*80⅞
Georgia Railway & Electric Company (preferred)	—	*85
Interborough-Metropolitan Company (common)	12⅞	14½
Interborough-Metropolitan Company (preferred)	38	42½
Interborough-Metropolitan Company, col. 4½s	—	78⅛
Kansas City Railway & Light Company (common)	—	*a42½
Kansas City Railway & Light Company (preferred)	—	*a82
Manhattan Railway	*143	*143
Massachusetts Electric Companies (common)	14½	*14½
Massachusetts Electric Companies (preferred)	72	72½
Metropolitan West Side Elevated Railway, Chicago (common)	*10	*a18
Metropolitan West Side Elevated Railway, Chicago (preferred)	*48	*52
Metropolitan Street Railway	23	*23
North American Company	79⅜	80½
Northwestern Elevated Railroad (common)	—	*a22½
Northwestern Elevated Railroad (preferred)	—	*a68½
Philadelphia Company, Pittsburg (common)	42⅛	42¾
Philadelphia Company, Pittsburg (preferred)	42⅛	43
Philadelphia Rapid Transit Company	28⅞	30
Philadelphia Traction Company	93	92½
Public Service Corporation, 5 per cent col. notes	a100½	a100½
Public Service Corporation, ctfs.	a82	a82½
Seattle Electric Company (common)	—	a91½
Seattle Electric Company (preferred)	—	a98
South Side Elevated Railroad, Chicago	—	*a60
Toledo Railways & Light Company	—	12⅞
Third Avenue Railroad, New York	—	28½
Twin City Rapid Transit Company, Minneapolis (common)	104½	a104½
Union Traction Company, Philadelphia	55	55⅜
United Railways & Electric Company, Baltimore	—	11½
United Railways Investment Company, San Francisco (common)	—	*a35
United Railways Investment Company, San Francisco (preferred)	—	*a54
Washington Railway & Electric Company (common)	—	*a44
Washington Railway & Electric Company (preferred)	—	*a91¼
West End Street Railway, Boston (common)	—	96¾
West End Street Railway (preferred)	—	*110½
Westinghouse Electric & Manufacturing Company, 1st pfd.	—	117

a Asked. * Last sale.

Report of Nashville Railway & Light Company

The Nashville Railway & Light Company, Nashville, Tenn., has recently made public the following comparative statement of earnings for 1908 and 1907:

	1908.	1907.
Earnings from operating and other sources	$1,597,029	$1,578,207
Operating expenses and taxes	954,296	969,105
Earnings, less operating expenses and taxes	$642,733	$609,102
Interest on funded debt and current liabilities	393,099	354,902
Net income	$249,633	$254,200
Reserve miscellaneous, including depreciation	47,742	37,710
Net income	$201,891	$216,490
Reserve miscellaneous transferred to profit and loss	45,000	30,249
Net income	$246,891	$246,740
Dividend on preferred stock, 5 per cent	123,445	123,445
Net income to profit and loss	$123,446	$123,295

Special Franchise Assessments in New York City

The State Board of Tax Commissioners has completed its special franchise tax assessments for New York City. The final assessments of the electric railway companies for 1909 compared with 1908 follow:

	1909.	1908.
Brooklyn City & Newtown Railroad	$2,425,000	$3,000,000
Brooklyn Rapid Transit system	55,252,700	55,437,900
Coney Island & Brooklyn Railroad	2,543,000	2,750,000
Hudson & Manhattan Railroad	8,000,000	6,900,000
Long Island Electric Railway	425,000	475,000
Manhattan Railway	78,500,000	78,500,000
New York & Long Island Railroad	4,850,000	4,850,000
New York & Queens County Railroad	2,275,000	2,386,200
Pennsylvania Tunnel & Terminal	15,600,000	6,316,300
Richmond Light & Railroad Company	534,900	500,000
Interborough Rapid Transit Company	24,012,000	24,012,000
Metropolitan Street Railway	65,656,000	68,303,000
Third Avenue Railroad	19,057,000	19,562,000

Angelo Power & Traction Company, San Angelo, Cal.—A. J. Baker has been appointed receiver of the Angelo Power & Traction Company.

Ardmore (Pa.) Street Railway.—The Safe Deposit & Trust Company and Robinson Brothers, Pittsburg, and Newburger, Henderson & Loeb, Philadelphia and New York, are offering for subscription at 99½ and interest the unsold portion of $500,000 first mortgage 5 per cent gold bonds, of the Ardmore Street Railway, unconditionally guaranteed as to principal and interest by the Consolidated Traction Company, which owns the entire stock of the Ardmore Street Railway. The bonds are dated 1908, and are due April 1, 1958, but are subject to call at 105 and interest. The interest is payable April and October. The authorized issue is $1,250,000. Of this amount $1,000,000 is outstanding and $250,000 is reserved for extensions, etc.

Atlantic & Suburban Railway, Pleasantville, N. J.—John L. Clawson has secured his discharge as receiver of the Atlantic City & Suburban Traction Company, which has been succeeded by the Atlantic & Suburban Railway. The reorganization was arranged by the first mortgage bondholders. It eliminated the old $250,000 second mortgage bonds, the $750,000 of stock and the company's outstanding debts, which were between $125,000 and $150,000. The Atlantic & Suburban Railway has $650,000 of stock and $650,000 of first mortgage 4 per cent bonds. The $500,000 of first mortgage 5 per cent bonds of the Atlantic City & Suburban Traction Company have been exchanged for $500,000 of the new 4 per cent bonds. Practically all of the remaining $150,000 bonds have been sold to provide new equipment and working capital.

Chicago & Milwaukee Electric Railroad, Chicago, Ill.—A committee of the bondholders of the Illinois division of the Chicago & Milwaukee Electric Railroad is said to be considering plans to secure $500,000 for improvements. The plan that is most favored is said to provide for the retirement of the existing $5,000,000 bonds by an issue of preferred stock and placing only a $700,000 mortgage on the property. Holders of bonds due in 1919 and 1922 would get the first preferred stock at the present market values of their holdings, 84 and 60 respectively, and the balance of the face value in second preferred stock. Common stock to the amount of $5,000,000 without voting power, but with power to retire the preferred at par and accrued dividends, would be issued for the present stock on a basis of 1 to 5 for the preferred at 1 to 3 for the common.

Denver (Col.) City Tramway.—Clark, Dodge & Company, New York; International Trust Company, Denver, and E. W. Clark & Company, Philadelphia, recently offered for subscription at 95 and interest $1,848,000 of 5 per cent first and refunding sinking fund mortgage bonds of the Denver City Tramway, due Nov. 1, 1933. There is an annual cumulative

sinking fund of 1 per cent of the par value of bonds outstanding from November, 1914, to November, 1923, and 2 per cent of the par value of bonds outstanding thereafter. The bonds are callable as a whole, but not in part (except for the sinking fund) at 105 on any interest day from May, 1914, to November, 1923, and at 102½ on any interest day thereafter.

Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y.—The Public Service Commission of the Second District of New York has granted the application of the Fonda, Johnstown & Gloversville Railroad for permission to increase its capital stock from $2,500,000 to $3,500,000, but has authorized the company to issue only $500,000 of the $1,000,000 of additional capital at this time. The new issue is to be 6 per cent preferred stock. J. Ledlie Hees, president of the company, in a circular dated March 30, offers to the holders of the $2,500,000 outstanding common stock the right to subscribe at par ($100 per share) for $500,000 of the $1,000,000 6 per cent cumulative preferred stock recently authorized by the stockholders to the extent of 20 per cent of their holdings. A syndicate has agreed to take at par all the stock not otherwise subscribed for. Mr. Hees in his letter to the stockholders says in part: "Stockholders desiring to subscribe may do so on or before April 15 by forwarding their subscription to G. M. Place, treasurer, Gloversville, N. Y., accompanied by a remittance for 10 per cent of the same. The remainder will be payable April 30 and dividends will accrue from that date. The consent of the Public Service Commission of the Second District of New York has been received to the issue of the $500,000 stock offered for the payment of indebtedness incurred on account of new construction. The remaining $500,000 is reserved for future betterments and can only be issued upon further authority of the commission. Dividends on the new stock are payable quarterly on the 15th days of March, June, September and December out of surplus profits. The dividends on the proposed issue will amount to $30,000 a year, and through the payment of loans will reduce interest charges by practically an equal amount."

Louisville (Ky.) Railway.—The Louisville Railway has recently sold $1,000,000 of 40-year 4½ per cent second mortgage bonds to the Fidelity Trust Company, Louisville, Ky., for betterments and to acquire obligations against, and securities of, the Louisville & Eastern Railroad, which is in the hands of a receiver. The bonds just sold are part of an issue of $2,000,000, of which $1,000,000 had been sold previously.

Mansfield Railway, Light & Power Company, Mansfield, Ohio.—John C. Carpenter, A. A. Cornell, F. A. Durbin, S. E. Findley, Leopold Kleybolte, H. M. Byllesby and other stockholders of the Mansfield Railway, Light & Power Company have asked for the appointment of a receiver for the company and that the property be sold and the proceeds turned over to the stockholders. The Cleveland, Southwestern & Columbus Railway owns a controlling interest in the Mansfield Railway, Light & Power Company.

Northern Ohio Traction & Light Company, Akron, Ohio.—The Northern Ohio Traction & Light Company has authorized an issue of $1,000,000 of 6 per cent collateral trust notes, to be dated May 1, 1909, and to mature in annual installments on Nov. 1, from 1911 to 1918. The notes will be secured by the deposit of $1,000,000 of 4 per cent bonds of the Northern Ohio Traction & Light Company; $700,000 of 5 per cent bonds of the Canton-Akron Railway, and $200,000 of 5 per cent bonds of the Akron, Wadsworth & Western Railway. The proceeds of the notes will be used to take up $600,000 of 6 per cent collateral trust notes of the Northern Ohio Traction & Light Company, due Sept. 1, 1909; $300,000 of 5 per cent second mortgage bonds of the Canton-Akron Railway due May 1, 1909, and $100,000 of 5 per cent first mortgage bonds of the Tuscarawas Electric Company.

Philadelphia, Bristol & Trenton Street Railway, Philadelphia, Pa.—The Union Trust Company, Baltimore, Md., trustee of a mortgage for $650,000 given by the Philadelphia, Bristol & Trenton Street Railway, has applied for the appointment of a receiver for the company, which has defaulted in the payment of interest on the bonds secured by the mortgage.

Southwestern Traction Company, London, Ont.—The London & Southwestern Trust Company has been appointed temporary receiver for the Southwestern Traction Company.

Union Street Railway, New Bedford, Mass.—The Union Street Railway has applied to the Railroad Commission for permission to issue additional stock at $140 a share to realize $225,000 and $100,000 of additional bonds, to pay floating debt and for improvements and extensions.

Traffic and Transportation

T. P. Shonts on Earnings and Operation of New York Subway

T. P. Shonts, president of the Interborough Rapid Transit Company, New York, in an interview in the New York *American* of April 4, answered various questions.

Referring to the earnings of the subway, Mr. Shonts said:

"The existing subway does not pay 9 per cent on its original capital, but in fact earns less than 6 per cent on its actual cash cost. The existing subway was built under a form of laws which removed all taxation, and when constructed the city did not impose any limitation or restrictions upon the builders with reference to open cuts and character of construction, which, in the minds of the builders and engineers, would lead to the completion of the system at the earliest possible date and with minimum expense.

"Even in the face of this most favorable method of construction the consulting engineer of the Public Service Commission, in a recent official report, said that a substantial percentage of the 9 per cent dividend on the Interborough Rapid Transit Company stock is earned through the lease of the elevated system.

"The actual rtturns from passenger traffic, in the existing subway, for the year ended June 30, 1908, after deducting operating expenses, reasonable maintenance charges, and no taxes except on real estate and the excess dividend taxes, which were nominal, amounted to but 5.95 per cent on the actual cash investment. It is not to be expected that a new subway would accommodate a greater density of traffic, nor could a new subway be built at a less cost per mile. Therefore, it is not reasonable to expect that any new subways, except for strictly short-haul business, could do as well as the present subway has done, with a result of less than 6 per cent return, as shown above."

On the subject of separate cars for women or for smokers, Mr. Shonts stated:

"Owing to the density of traffic in the subway, if the rear car of each train is devoted to the use of women only we believe it will not be a success and will interfere to such a degree that it will decrease the present efficiency of the subway. However, if it is the opinion of the Public Service Commission that we should devote the rear car exclusively to women, we will make the experiment, although our operating officers do not believe it will prove a success.

"As to using the forward car of each train as a smoking car, the lease of the operaing company of the present subway provides that smoking cars can be used on the subway if the operating company desires. But since the lease was executed, a resolution has been adopted by the Board of Health prohibiting smoking in the subway, and the operating officers believe that the smoking car should not be installed for the reason that it would tend to interfere with the efficiency of the system and would also prove objectionable from a sanitary standpoint. Experience has told the operating officers that it is practically impossible to keep even elevated cars clean and in a sanitary condition when smoking is permitted."

All future subway cars ordered will be of steel, Mr. Shonts stated.

The increase in traffic is shown by the following figures given by Mr. Shonts:

"During the fiscal year ending June 30, 1905, the subway having been operated only for the period from Oct. 27, 1904, to June 30, 1905, the traffic was 72,722,890 passengers. The following year passenger traffic in the subway grew to 137,919,632, an increase of 89.65 per cent. During the year ending June 30, 1907, the number of passengers carried was 166,363,611, an increase over the previous year of 20.62 per cent, and for the year ended June 30, 1908, the traffic was 200,439,776 passengers, or an increase of 20.48 per cent over the preceding year."

The Experiment with Exclusive Cars for Women

In accordance with its published announcement, the Hudson & Manhattan Railroad, which operates the tunnel under the Hudson River between New York and New Jersey, began on March 31 to reserve the rear car of every train leaving Hoboken for New York between 7 a. m. and 9 a. m. and leaving Twenty-third Street and Sixth Avenue, New York, between 4:30 p. m. and 7 p. m. for the exclusive use of women. Uniformed porters wearing red caps are stationed on the platforms at Hoboken and at Twenty-third Street and Sixth Avenue to direct the women, and the rear car of each train carries a large sign which reads: "Rear

car reserved exclusively for women." At first there was some confusion, but very little trouble is experienced now, and the exclusive cars for women will be given a thorough trial by the company.

In reply to the complaint order of the Public Service Commission of .the First District of New York asking it to show cause why the rear car of each express train in the New York Subway should not be reserved for women, the Interborough Rapid Transit Company has addressed a letter to the commission over the signature of Frank Hedley, vice-president and general manager, in which it says:

"The Interborough Rapid Transit Company has always been ready to do anything to ameliorate the conditions in the subway, and the officers have often discussed the feasibility of setting aside a separate car for women and children, but the density of the traffic is so great that the conclusion has always been that the experiment would not prove successful. If, in the judgment of your honorable body, you think that the suggestion of setting aside the rear car of express trains for the use of women and children is worth the experiment, this company is perfectly willing to try it upon receipt of advice to do so."

Hearing to Be Held on the Question of Waiting Rooms at Worcester.—The Board of Aldermen of Worcester has petitioned the Massachusetts Railroad Commission to give a hearing on the waiting-room and station accommodations furnished by the Worcester (Mass.) Consolidated Street Railway.

Texas Company Increases Fare.—The Belton & Temple Traction Company, operating in Temple and between Temple and Belton, has given notice of its intention to discontinue the sale of six tickets for 25 cents in Temple and to charge a straight 5-cent fare in Temple hereafter. The rate of fare between Belton and Temple will remain as at present.

Express Franchise Granted in Massachusetts.—The Selectmen of Monson, Mass., have passed an ordinance granting the Springfield & Eastern Street Railway, Palmer, Mass., permission to carry express in Monson. The company is to deliver goods by team until June 1, after which the terms of the grant to the company provide that stations shall be established.

Conductor Sentenced for Stealing Fares.—Louis Finstein, a conductor in the employ of the Boston (Mass.) Elevated Railway, was recently found guilty of stealing fares from the company by Judge Almy in the Cambridge District and was sentenced to serve 30 days in the House of Correction. A plea by Finstein's lawyer to file the case failed, Judge Almy remarking that he owed it to the community and to the other conductors of the company to pass sentence on Finstein.

Ferry Lease Not Renewed.—The Norfolk & Portsmouth Traction Company, Norfolk, Va., which has operated the Norfolk County Ferries under lease for 10 years, has not renewed its operating agreement with the ferry company. Reid & Company have leased the ferry property at $135,200 per annum. The Norfolk & Portsmouth Traction Company has a claim against the Norfolk County Ferries for $190,000 for improvements and betterments to the property, and appraisers are now at work upon the award to be made under this claim.

Finding of Commission in Massachusetts Accident.—The Massachusetts Railroad Commission attributes the collision between surface cars on the Boston Elevated Railway on Blue Hill Avenue, Boston, on March 3, to the failure of the employees to understand and observe the rules requiring a speed reduction to test the working of the brakes before taking a heavy descending grade and calling for a stop at certain specified crossings. Strict discipline in regard to such rules is emphasized by the board as necessary in its findings.

Transportation Committee Appointed for New England.—A committee of transportation and business men has been formed in Boston for the purpose of working out an intelligent system of transportation for Boston, the State of Massachusetts, and New England as a whole, covering steam and electric freight, passenger and express traffic and facilities. Among the members of the committee are: General William A. Bancroft, president of the Boston Elevated Railway; Robert Winsor, of the executive committee of the Boston Elevated Railway; C. S. Mellen, president of the New York, New Haven & Hartford Railroad; Lucius Tuttle, president of the Boston & Maine Railroad, and J. H. Hustis, assistant general manager of the Boston & Albany Railroad. Definite organization will soon be effected.

Brooklyn Veteran Honored.—William Shore, who for 50 years has been a horse-car driver and motorman for the Brooklyn City Railroad and the Brooklyn Rapid Transit Company, was the principal guest at a dinner given recently by the officers of the company in recognition of his long service and honorable record. At the table were Thomas Doran, John Boschen, Frederick Goebel, Peter Peppard and Thomas MacAleen, each of whom has served more than 40 years in the Brooklyn system. Others at the dinner were A. N. Dutton, superintendent of transportation; William Seibert, general superintendent of surface lines; Frank C. O'Keefe, superintendent at East New York; George W. Edwards, secretary of the B. R. T. Employees' Association, and John Stoll and Henry Heithass, representing the employees' association.

Inland Empire System Extends Parlor Car Service.—The parlor car service which was inaugurated on the Cœur d'Alene division of the Inland Empire System, Spokane, Wash., three years ago, has proved such a success that Waldo G. Paine, traffic manager of the system, has installed a similar service on the Inland division, which extends south from Spokane for a distance of 40 miles to Spring Valley Junction, at which point it diverges, the western branch running to Colfax, and the eastern to Moscow. Trains of four cars are run to Spring Valley Junction, where they are divided, two cars going south to Colfax and two to Moscow. The Moscow train is made up of a combined baggage, express and smoking car and a regular passenger car with a parlor compartment in the rear with wicker chairs, upholstered in plush, and at the extreme rear an observation smoking compartment. It is announced that as soon as the cars under construction at the shops of the Inland Empire System are finished, a similar parlor car service will be installed on the Spokane-Colfax division.

Self-Propelled Cars for New York Crosstown Lines.—Frederick W. Whitridge, receiver of the Third Avenue Railroad, New York, has made arrangements for testing one storage-battery car and one gasoline-electric car on St. Nicholas Avenue, New York. The run is about 1½ miles long, and will afford an excellent route for determining the possibility of substituting either type of self-propelled cars for the present horse cars. It is expected that the storage-battery car will be ready by May 15 and the gasoline-electric car by June 1. Both cars will be 22 ft. long, with 4-ft. platforms, and the bodies will be carried on single trucks. The seating capacity of each car will be 28 passengers. The equipment of the storage-battery car, which is under construction by The J. G. Brill Company, will consist of 200 to 225 cells of the new Edison nickel storage battery and two 35-hp GE motors of special design. At first the batteries will be carried under the seats, but later it is intended to carry them below the car and between the wheels; the motors will be carried outside of the wheels. The batteries will be charged for a run of 70 miles, which is ample to insure service for a day without recharging. The gasoline-electric car, which is under construction by the General Electric Company, will be equipped with a standard 500-volt GE railway motor of 40 hp to 50 hp, and a gasoline-electric generating-set mounted in a cab. These statements regarding the apparatus are somewhat tentative, as all of the details have not yet been decided.

Directory of Chicago Elevated Railways.—A directory of authorized and concise information about the elevated railways in Chicago has been published by J. B. McComber, of the South Side Elevated Railroad. Each page has eight columns headed: Street, street number, location, elevated, division, station, blocks and direction. Given the street number of a house or building within walking distance of any branch of any of the elevated railways in Chicago, one can learn how to reach the address by consulting the directory. In the first column the streets can be found alphabetically listed; in the second column the numbers near the elevated stations along those streets; in the third column the division of the city—north, east, south or west side; in the fourth column the name of the elevated railway serving the street referred to; in the fifth column the name of the division of the elevated railway, and in the next column the station nearest the street and number required. The last two columns show the number of blocks necessary to walk and the direction after leaving the elevated station. Other information of interest similarly compiled includes directions for reaching hotels, banks, theaters, clubs, hospitals, public buildings and city departments. The publication also contains a list of the suburban towns and villages reached by outlying electric railways, simple instruction as to how to reach the terminals of the lines by means of the elevated railways and maps and complete timetables of all the elevated railways in Chicago and of the suburban electric railways.

Personal Mention

Mr. W. R. Taylor has resigned as manager of the Hull Electric Company, Aylmer, Que.

Mr. G. Gordon Gale has been appointed acting general superintendent of the Hull Electric Company, Aylmer, Que.

Mr. C. B. Keiser, formerly assistant electrical engineer of the West Jersey & Seashore Railroad, has been appointed master mechanic of the Pennsylvania Tunnel & Terminal Railroad Company, with office at 315 Fifth Avenue, New York.

Mr. D. S. Josslyn, president of the Portland Railway, Light & Power Company, Portland, Ore., was one of the principal speakers at a banquet given in Portland of 350 business men on March 23. Mr. Josslyn spoke on the transportation service for a half-million city, which Portland expects to be before long.

Mr. Edwin Hawley has been elected a director of the Interborough-Metropolitan Company, New York. Within the last two years Mr. H. M. Fisher, Mr. W. Leon Pepperman, Mr. W. G. Roelker, Mr. R. R. Govin and Mr. August Belmont, Jr., have been elected directors of the company, and Mr. Paul D. Cravath, Mr. J. S. Auerbach, Mr. John D. Crimmins, Mr. J. B. McDonald, Mr. De Lancey Nicoll, Mr. Geo. W. Wickersham and Mr. W. G. Oakman have all retired as directors.

Mr. K. McCaskill, who has been connected with the electrical engineering department of the New York Central & Hudson River Railroad for the last two years in the electrification of the terminal in and about New York City, has entered the employ of the Southern Pacific Railroad in connection with the electrification of its suburban branches in Oakland, Alameda and Berkeley. Mr. McCaskill's work will be chiefly in connection with transmission, distribution and catenary construction.

Prof. H. H. Norris, professor of electrical engineering, Cornell University, Ithaca, N. Y., who has been acting head of the electrical department of the university for the past four years, was elected to permanently fill that position last week. This is the office formerly occupied by Professor Ryan. Professor Norris is chairman of the committee on education of the American Street & Interurban Railway Association and also of the corresponding committee of the American Institute of Electrical Engineers. He has presented a number of papers before both bodies, and also drafted the present constitution and by-laws of the American Street & Interurban Railway Association.

Mr. Theodore Stebbins, who has recently resigned as general manager of the Texas Traction Company, Dallas, was the principal speaker at a meeting and entertainment given last month to ex-President Charles W. Eliot, of Harvard University, at the Agricultural and Mechanical College of Texas. The topic of Mr. Stebbins' address was "Electric Railways." He gave statistics of the development of electric roads in this country and compared the conditions in Texas and Ohio, saying the former has six times the area, three-quarters the population and one-twentieth the interurban mileage of the latter. He said experience had shown that farm lands had increased $100 in value for every dollar made (or lost) in the operation of interurban electric lines.

Mr. J. R. Harrigan has been appointed general superintendent of the Columbus, Delaware & Marion Railway, Marion, Ohio, in complete charge of the operation. Mr. Geo. Whysall, general manager of the company, will hereafter give his attention to extensions and other work. Mr. Harrigan was manager of the Columbus, Buckeye Lake & Newark Traction Company and the Columbus, Newark & Zanesville Electric Railway before they were taken over by the Ohio Electric Railway. He was formerly with the Canton-Akron lines and after the Northern Ohio Traction & Light Company was organized, Mr. Harrigan became connected with an electric railway near Buffalo. The new appointment dates from April 15. Mr. Harrigan's headquarters will be in Columbus.

Mr. S. B. Thompson, who recently resigned as mechanical engineer of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has re-entered the employ of Sanderson & Porter, New York, with whom he was formerly associated for several years, representing them in various classes of construction work done under their direction in connection with the railway and lighting properties of Youngstown. Some time this month Mr. Thompson expects to sail for Europe to spend three or four months studying the transportation problems in the different continental countries, in order to compare results with conditions in the United States, but more particularly to investigate the circumstances governing the use of alternating current for street railway work and the possibilities of alternating current for steam railroad service. Mr. Thompson will probably return to the United States before Sept. 1 to continue his duties with Sanderson & Porter and will most likely spend considerable time in the West after his return.

Mr. G. K. Jeffries, who was recently appointed superintendent of the Brazil and Danville lines of the Terre Haute, Indianapolis & Eastern Traction Company, with headquarters in Greenfield, in addition to superintendent of the Eastern Division of the company, was born in Indianapolis on July 9, 1866. In 1883, when he was 17 years old, Mr. Jeffries entered the service of the Cleveland, Cincinnati, Chicago & St. Louis Railroad as telegraph operator and in 1886 he was promoted to the position of train dispatcher. In 1889 Mr. Jeffries resigned from the Cleveland, Cincinnati, Chicago & St. Louis Railroad to enter the employ of the Erie Railroad as chief train dispatcher and train master, a position he filled for nine years. In 1903 Mr. Jeffries began his electric railway career as superintendent of the Indianapolis & Northwestern Traction Company's line between Indianapolis and Lafayette, and in 1906 he resigned from the Indianapolis & Northwestern Traction Company to become superintendent of the Terre Haute, Indianapolis & Eastern Traction Company's line between Indianapolis and Richmond. Many improvements in the physical property of the Terre Haute, Indianapolis & Eastern Traction Company have been made under the direction of Mr. Jeffries and he was largely responsible for the amicable settlement of a local controversy over rights of the company in Richmond.

OBITUARY

Henry A. Griswold, former president of the Anacostia & Potomac Railroad, now part of the system of the Washington Railway & Electric Company, Washington, D. C., died at Washington on March 30.

Edgar A. Keeler, one of the organizers of the Denver (Col.) Tramway, is dead. Mr. Keeler was born in Union, N. Y., in 1843, and went to Denver in 1883. He assisted in organizing the first horse railways and continued actively in street railway work until after the electrification of the Denver lines. Mr. Keeler was also interested in real estate.

NEW PUBLICATIONS

Alternating-Current Machines. By Samuel Sheldon, Hobart Mason and Erich Hansmann. New York: D. Van Nostrand Company, 1908; 353 pages (5¼ in. x 7¾ in.) including index; completely revised and illustrated. Price, $2.50 net.

Perhaps the only introduction this book needs is to mention the fact that it has now entered its seventh edition. Its special field is in technical schools, but it has also been found useful to independent students who have some familiarity with the integral calculus. Aside from the mathematical deductions, the text will be found interesting, especially those sections relating to the recent types of single-phase railway motors.

Elektrotechnische Jahrbuch (Electrotechnical Annual). Published by Siegfried Herzog, Engineer Union Deutsche Verlagsgesellschaft, Stuttgart, Berlin, Leipzig; 1909; 298 pages (6½ in. x 9¾ in.). Subscription price, 9 marks, payable in advance each year.

This electrotechnical annual is in the form of a progressive dictionary chronicling under separate headings the latest developments in each important branch of the electrical art. The chapter on railways, for instance, describes the Prussian State Railway's accumulator cars, cost of prominent single-phase and d.c. railway operation under specified conditions, trackless trolleys, etc. An important feature is the system of references to more extended descriptions in other publications.

Dean Herman Schneider, of the University of Cincinnati, will deliver a paper at the New York meeting of the A. I. E. E. on April 16, on Fundamental Principles of Industrial Education. This is one of the papers arranged by the educational committee in its plans to lay before the Institute members the problems of industrial and technical education. Last year the committee devoted its time to problems of technical education, and it has been deemed wise this year to present some phases of a more elementary industrial training. Dean Schneider believes that the co-operative principle applies to industrial and technical training, and his paper outlines the system which he has been successfully following.

Construction News

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

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

RECENT INCORPORATIONS

***Elgin & Sycamore Railway, Elgin, Ill.**—This company has been incorporated in Illinois for the purpose of constructing an electric railway through Elgin to Sycamore and thence through De Kalb to Dixon and to Aurora. Capital stock, $100,000. Directors: B. C. Payne, F. N. Rogers, E. S. Bailey, F. J. Hohling, F. W. Merrick and F. N. Rogers, all of Elgin.

***Elgin & Evanston Railway, Berwyn, Ill.**—This company has been incorporated to construct an electric railway from Elgin through Desplaines to Evanston. Capital stock, $2,500. Incorporators: C. A. Sayer, J. A. Hessler, A. W. Hellis, E. F. Reynolds and G. H. Norton, all of Berwyn.

Anoka-Minneapolis Suburban Railway Promotion Company, Minneapolis, Minn.—This company has been incorporated to construct an electric railway between Anoka and Minneapolis. Capital stock, $50,000. Incorporators: H. L. Patthey, Minneapolis; A. E. Giddings, L. J. Greenwold, C. N. Ball, R. W. Akin and A. R. Pratt, Anoka, and C. J. Swanson and C. A. Nelson, Fridley. [E. R. J., March 20, '09.]

***International Power Company, Milltown, N. B.**—Application has been made to the Dominion and Provincial governments for a charter, giving the International Power Company the right to build an electric railway from St. Stephens to Sprague's Falls. The company also asks for permission to erect a dam at a point on the St. Croix River, between Sprague's Falls and Baring. George A. Curran, Calais, Maine, and Irving G. Todd, Milltown, are interested in the proposed railway.

***Ohio Northern Electric Railway, Tiffin, Ohio.**—This company has been incorporated in Ohio to construct an electric railway from Bucyrus to Tiffin. It is stated that eventually it will be extended to Toledo. Incorporators: George W. Stewart, James S. Gray, B. F. Whitney, K. Feickert and E. A. Whiting. Capital stock, $50,000. Headquarters, Tiffin.

Rapid Transit Railway & Tunnel Company, Wheeling, W. Va.—Application has been made by this company for a charter to construct an electric railway from Wheeling to Pittsburgh, Pa. Among the applicants for the charter are: Albert M. Schenk, E. W. Stifel, D. L. Merriman and Ambrose S. List, Wheeling, and J. R. Kommer, Pittsburgh, Pa. [E. R. J., April 3, '09.]

FRANCHISES

***Los Angeles, Cal.**—The City Council has passed an ordinance granting to W. H. Workman a franchise for an electric street railway along Boyle Avenue from Seventh Street to Stephenson Avenue.

Sacramento, Cal.—The Central California Traction Company has applied to the Board of Supervisors for a franchise for an extension of its railway which is to traverse Sacramento Street in Oak Park from Thirty-first and Y to Magnolia Avenue, on Magnolia Avenue east to the Upper Stockton Road, and south on the Upper Stockton Road a distance of about 1½ miles.

***San Mateo, Cal.**—A petition has been presented to the City Trustees by Messrs. Obear and Ames for a franchise to construct an electric belt railway in San Mateo.

***Twin Falls, Idaho.**—It is stated that I. B. Perrine will, within a week or two, apply to the City Council for a franchise to construct and operate an electric street railway in Twin Falls.

Chicago, Ill.—The City Council has granted a franchise to the Kensington & Eastern Railroad. The railway is a feeder for the Illinois Central Railroad, by which it secures a freight inlet to Gary, and is also to be used by the interurban lines of northern Indiana and Ohio as an entrance to Chicago. [E. R. J., March 20, '09.]

Newcastle, Ind.—The City Council has granted an extension of the provisions in the franchise held by the Indianapolis, New Castle & Toledo Traction Company for a new line between New Castle and Muncie. It now provides that work shall begin Jan. 1, 1911.

Mounds, Ill.—The City Council has passed an ordinance granting a franchise to the Cairo & St. Louis Interurban Railway, Cairo. The company proposes to build an electric railway from Cairo to East St. Louis. [E. R. J., Dec. 12, '09.]

Independence, Mo.—The County Court has granted to Samuel T. McDermott, who is said to represent the Blue Valley Railway, permission to cross county roads in constructing an electric railway from Kansas City to East Swope Park Highlands. The southern terminus is to be at Sixty-seventh Street and Cambridge Avenue, and the Kansas City terminus at Seventeenth Street and Manchester Road. The grant covers about 8.5 miles. [E. R. J., July 11, '08.]

New York, N. Y.—The New York & North Shore Traction Company, Mineola, N. Y., has obtained from the Board of Estimate and Apportionment a franchise to construct and operate a double-track street railway from the intersection of proposed tracks on Chestnut Street, Murray Hill, Queens, to Whitestone. This line will be a spur of the railway to be constructed from Little Neck to Flushing.

***Riverhead, N. Y.**—Application for a franchise to build an electric railway in Riverhead has been made to the Town Board by John E. Root, New York; George W. Reeves and Frederic M. Lewis, and J. Madison Wells, Greenport, and George F. Stackpole, Riverhead. It is proposed to build and operate an electric railway from the Riverhead depot to Orient Point.

Syracuse, N. Y.—The Public Service Commission of the Second District has granted the application of the Rochester, Syracuse & Eastern Railroad to change its route from Port Byron to Syracuse. The application asked for permission to change the route in the vicinity of Peru, so that instead of following to the south of the New York Central Railroad tracks the railway would cross over the tracks to Memphis and proceed along the north side until a junction with the Lakeshore Railroad was effected near the State Fair Grounds.

Utica, N. Y.—The Utica & Mohawk Valley Railway has applied to the City Council for two franchises for extensions on Mohawk Street and Whitesboro Street, to take the place of those which the company last year forfeited by reason of its non-compliance with the terms on which they were granted.

***Cleveland, Ohio.**—Application has been made to the City Council by H. Schmidt, for permission to construct and operate a double-track street railroad upon the following streets in Cleveland: Beginning at the intersection of Abbey Avenue S. W. and West Fourteenth Street, thence in, through and along Abbey Avenue S. W. and Lorain Avenue to West Twenty-fifth Street.

***Coquille, Ore.**—The City Council has granted a 20-year franchise to the Coquille Mill & Mercantile Company to build an electric street railway and power plant in Coquille.

Carlisle, Pa.—The Town Council has passed an ordinance granting the Cumberland Railway a franchise to construct its proposed street railway over certain streets of Carlisle. [E. R. J., March 20, '09.]

TRACK AND ROADWAY

***Rogers, Pea Ridge & Northern Interurban Railway, Rogers, Ark.**—This company is reported to have been organized at Rogers for the purpose of building an electric railway 20 miles in length. W. T. Patterson, engineer for the company, is said to have completed the survey and is now preparing drawings and blue prints which will be submitted. Officers: A. P. Potter, president; J. F. Walker, vice-president; W. T. Patterson, second vice-president; Bryan Snyder, secretary, and J. J. Putman, treasurer. Headquarters, First National Bank Building, Rogers.

San Jose (Cal.) Railway.—G. L. Baker, manager, writes that this company expects to rebuild its entire street railway. The line will be changed from narrow to standard gage. The system comprises about 15.5 miles of track.

***Santa Barbara, Cal.**—The Pacific Improvement Company has petitioned the City Council for the right to construct a power line to the Hope Ranch, 4 miles west of Santa Barbara. The company announced its intention of installing a trackless trolley to the ranch.

Denver, Colorado Springs & Pueblo Interurban Electric Railroad, Denver, Colo.—This company advises that it expects to have all preliminary arrangements completed so that it will be possible to award contracts on or about June 1. The electric railway which this company proposes to build will extend from Denver to Colorado Springs and Pueblo, a distance of 120 miles. The power station and repair shops will be located in Denver. Headquarters, Cooper Building, Denver. Capital stock authorized, $1,500,000; bonds authorized, $3,000,000. Officers: Louis M. Pfeiffer, president and general manager; W. T. Beriford, vice-president; Arthur E. Van Deusen, secretary and acting treasurer; W. H. Roberts, engineer, all of Denver. [E. R. J., Feb. 27, '09.]

Washington, Spa Springs & Gretta Railroad, Washington, D. C.—This company has filed a mortgage on all its

property to secure an issue of bonds to the extent of $500,000, payable in 20 years, with interest at 5 per cent. The company is about to begin the construction of its proposed electric railway, which is to extend from Fifteenth and H Streets northeast along the Bladensburg Road to the district line, thence by way of Bladensburg and Berwyn Heights to Laurel, Md., about 18 miles. [S. R. J., Jan. 25, '08.]

Fitzgerald & Ocilla Electric Railway & Power Company, Fitzgerald, Ga.—C. A. Holtzendorf advises that this company has completed all preliminary work, surveys, etc., for its proposed 12-mile electric railway between Fitzgerald and Ocilla. It is probable that the company will be ready to award contracts by May 31. The company expects to operate from 4 to 6 cars. A power station will be built on Lake Beatrice midway between Fitzgerald and Ocilla. The repair shops will be erected near the power plant. Power will be supplied for lighting. Capital stock, authorized, $100,000, of which about two-thirds has already been issued. Bonds authorized, $250,000. Headquarters, Fitzgerald. New York office, 61 Fifth Avenue. Officers: S. Tilden Holtzendorf, New York, N. Y., president; Judge D. B. Joy, Fitzgerald, vice-president; C. A. Holtzendorf, Fitzgerald, secretary-treasurer and general manager. General Engineering & Contracting Company, New York, N. Y., engineers. [S. R. J., Feb. 1, '08.]

Woodstock-Sycamore Traction Company, Chicago, Ill.—An officer writes that this company has completed 14 miles of grading and fences for its proposed gasoline motor railway from Woodstock to Franklinville, Marengo, Geneva and Sycamore, 36 miles. Contracts have been recently placed for 65,000 ties, some of which are now being delivered and distributed along the route. A repair shop will be built in Marengo. Capital stock authorized, $1,000,000; bonds authorized, $700,000. Headquarters, 711 Tacoma Building, Chicago. Officers: C. G. Lumley, president; W. L. Abbott, vice-president; Charles A. Spenny, secretary; I. D. Stevens, treasurer, all of Chicago. [E. R. J., Jan. 30, '09.]

Springfield & Jacksonville Electric Railway, Springfield, Ill.—It is officially announced that this company has completed the final surveys and secured the rights-of-way for the electric railway which it proposes to build from Springfield to Jacksonville, via Berlin, a distance of nearly 33 miles. It is the intention to begin construction work about May 15. The company plans to build its own power station, but a site has not yet been secured for it. Capital stock, authorized, $100,000. Bonds, authorized, $800,000. Headquarters. 500 Myer Building, Springfield. Officers: O. J. Lucas, Latham; D. H. Sims, vice-president and treasurer; D. B. Sims, secretary, Mt. Pulaski; John Melick, Springfield, chief engineer. [E. R. J., Nov. 7, '08.]

Gary & Southern Traction Company, Crown Point, Ind.—H. W. Seaman writes that this company is just closing up its right-of-way and financial matters and expects to be prepared to go on with construction work on its proposed electric railway within the next 60 days. The railway will extend from Gary to Crown Point, a distance of about 12 miles. The location of the power plant and repair shops has not yet been definitely decided upon. Capital stock, authorized, $10,000. Officers: H. W. Seaman, president, and F. M. Clark, secretary, The Rookery, Chicago, Ill. [E. R. J., June 6, '08.]

***Kingman, Ind.**—It is stated that J. J. Burns & Company, Chicago, Ill., have presented a proposition to the people of Kingman for the construction of an electric railway to connect Kingman with Crawfordsville and Covington.

Sioux City, Crystal Lake & Homer Railway, Sioux City, Ia.—This company announces that it expects to place contracts within a few days for the electrification of about 1 mile of track. The company at present operates gasoline electric cars. J. A. Foye, Jr., superintendent.

***Sioux City, Ia.**—It is said that preliminary steps for the building of an electric interurban railway line between Sioux City and Hartington, Neb., have been taken by Sioux City and Nebraska business men. A conference at which the project was launched was recently held in Sioux City. Among those interested are C. T. Johnson, Martinsburg; James F. Toy, J. M. Lynch and J. N. Wood, Sioux City.

Kansas Union Traction Company, Altamont, Kan.—This company has closed a contract with Archer & Rollins, Kansas City, Mo., for the preliminary survey and report on the proposed railway between Parsons and Coffeyville, via Altamont and Edna. The engineers are arranging to begin this work within a few days.

Interstate Railway & Power Company, Kansas City, Mo.—R. C. Rawlings, president of this company, which is the successor to the Southern Kansas Railway, Light & Power Company, Chanute, Kan., writes that construction work will be begun during May on the Iola-Chanute, Kan., division and also the Lawrence, Kan., to Kansas City, Mo., section of this proposed electric railway system which when completed will be about 300 miles in length. It will be an overhead, single-phase line and will connect the following cities: Kansas City, Mo., Lawrence, Topeka, Baldwin, De Soto, Ottawa, Garnett, Iola, Humboldt, Chanute, Thayer, Parsons, Cherryvale, Independence and Coffeyville. A considerable amount of track has already been laid at Coffeyville. It is proposed to operate 22 city, 100 interurban, 12 express and 150 freight cars, also 67 50-ton locomotives. The plan of the company calls for the construction of two power stations, the main plant to be located at Chanute and a smaller one at Lawrence, Kan. The proposed railway will reach several amusement parks, some of which will be operated by the company. It has been decided to furnish power for lighting and other purposes. Capital stock, authorized, $4,000,000. Bonds, authorized, $11,000,000. Headquarters, 607 Bryant Building, Kansas City, Mo. Officers: R. C. Rawlings, Kansas City, Mo., president, general manager and purchasing agent; Charles E. Sutton, Lawrence, Kan., vice-president; F. C. Dixon, Chanute, Kan., secretary; L. Rosenthal, Chanute, Kan., treasurer; E. H. Abadie, St. Louis, Mo., electrical engineer; J. W. T. Stephens, New Orleans, La., chief engineer. E. R. J., Sept. 19, '09.]

Licking, Mo.—E. E. Young, Licking, Mo., and his associates are arranging to organize a company to construct a standard gage electric railway from Cabool, Texas County, Mo., to Rolla, Phelps County, a distance of 75 miles. Mr. Young would like to correspond with engineers and contractors to whom the line that he and his associates contemplate would appeal, with a view to their assisting in financing the railway and building it. [E. R. J., March 27, '09.]

***Moberly, Mo.**—It is reported that the people of Moberly and Huntsville have accepted a proposition made by Messrs. Manning and Wellman, Ottumwa, Ia., to construct an electric street railway in Moberly, and an interurban railway between Moberly and Huntsville.

Great Falls, Mont.—A meeting was recently held in Choteau in the interest of the proposed Great Falls & Choteau, which is being promoted by Dr. A. F. Longeway. It was decided to form a permanent organization in order to secure the necessary bonus for the company, and T. O. Larson was elected president of the proposed organization and he was given power to appoint executive and financial committees which will take up the matter of organization and the selecting of a secretary whose duty it shall be to circulate the bonus agreements. [E. R. J., Feb. 27, '09.]

Rockland Railroad, Nyack, N. Y.—This company has certified to the Secretary of State that it proposes to extend its railway from Nyack to Stony Point, Congers to Rockland Lake, West Nyack to Suffern, Nanuet to Pearl River, Sparkhill to State line, between New York and New Jersey. Benjamin A. Hegeman, Jr., president; Arthur C. Miller, second vice-president.

***Bradford County Traction Company, Towanda, N. Y.**—This company has been organized for the purpose of building a railway, to be operated by any other motive power than steam, in Towanda Borough. A franchise has already been granted the new company for lines in Towanda Borough and more or less right-of-way has been secured toward Athens and also toward Troy. Among the applicants who applied for a charter are: Edward Whalen, E. F. Kizer and George W. Kipp, Towanda; O. L. Haverly and George R. Hill, Athens.

Cleveland, Brooklyn & Elyria Railway, Cleveland, Ohio.—A meeting of the directors of this company has been called for April 20, when it is stated that action will be taken to increase the capital stock from $100,000 to $6,000,000, and other preparations will be made to begin the construction of the electric railway which is planned to connect Cleveland and Zanesville, Ohio. Another matter in contemplation is the change of name to the Cleveland, Barberton, Coshocton & Zanesville Railway. The proposed railway will touch Parma, Strongsville, Elyria, North Royalton, West Richfield, Ghent, Montrose, Copley, Royal Oak, Barberton, Doylestown, Orrville, Millersburg, Coshocton and Zanesville. J. Harry Knisely, Jr., secretary. Headquarters, 319 Citizens' Building, Cleveland. [E. R. J., Jan. 9, '09.]

***Durant, Okla.**—It is stated that Dr. S. W. Skillern, Tishomingo, is endeavoring to interest the business men of Durant in the organization of a company to construct an electric interurban railway from Oklahoma City to Denison, Tex.

Oklahoma City (Okla.) Railway.—It is announced that this company will begin within a few days the construction of 3½ miles of new track and the double tracking of 4

miles of track. The new extensions will be built to Lincoln Park; to the north side of University addition and Guernsey addition, and to the Jefferson Park addition.

Toronto & York Radial Railway, Toronto, Ont.—It is announced that this company will build about 15 miles of new track this year, having agreed to construct certain extensions asked for by the City Council in return for permission to construct down-town loops.

People's Railway, Toronto, Ont.—A by-law has been passed in New Hamburg by a vote of 135 to 99 to purchase $20,000 worth of preferred stock in the People's Railway. The company plans to build an electric railway, 88 miles in length, to connect Stratford, Berlin, Guelph and Woodstock, by way of New Hamburg, Berlin, Fergus and Eldora. [E. R. J., Feb. 13, '09.]

***Portland, Ore.**—In order to transport its employees between Kenton and the new Swift packing plant on Columbia Slough it is reported that the Union Meat Company will begin at once the construction of an electric railway 2½ miles long between Kenton and the plant. Bids have already been asked for the laying of steel and the overhead wiring. The right-of-way is to be along the new county road and trestle built by the company between the plant and the townsite, and power is to be secured from the mill of the Monarch Lumber Company.

Montgomery & Chester Electric Railway, Phoenixville, Pa.—This company expects to add about one-half mile of track to its railway. E. N. Corbin, superintendent.

***Pierre, S. D.**—Farmers in Union and Clay County are said to be working on a proposition for an electric interurban railway from Sioux City to Centerville, S. D. The proposed railway would be about 50 miles in length. A meeting was held at Alsen a few days ago, where the project was discussed. The meeting appointed Fred Heglin and John Norin, Dalesburg, and A. S. Anderson, Alsen, to look into the matter of organization.

El Paso & Fort Hancock Electric Railway, El Paso, Tex.—This company, which proposes to build an electric railway from El Paso to Fabens, has awarded a contract to Richard Caples for the first part of the work between El Paso and Ysleta. [E. R. J., Oct. 31, '08.]

San Antonio (Tex.) Traction Company.—This company advises that it will place contracts during the next two weeks for the construction of a 4-mile extension to Palm Garden.

Ogden (Utah) Rapid Transit Company.—This company announces that it has placed the following contracts during the past month for the construction of 15 miles of new track: John Roebling's Sons Company, 85,000 lb. wire, Colorado Fuel & Iron Company, 3 miles of 48-lb. rail, 2 miles of 40-lb. rail and 10 miles of 45-lb. rail; Ohio Brass Company, line material and rail bonds.

Norfolk City & Suburban Railway, Norfolk, Va.—J. M. Williams, general superintendent, advises that this company expects to place contracts during the next six weeks for the construction of about a mile of new track. The following material will be needed: 58-lb. rails, cross-overs, switches, Weber rail joints, 2-0 trolley wire, span wire, 30-ft. juniper poles and line material.

Walla Walla & Columbia Traction Company, Walla Walla, Wash.—W. S. Matthias, general manager of this company which has projected an electric railway from Dayton through Walla Walla to Wallula, has announced that the contract for the construction of the entire railway had been awarded McLeod & Dusseurt. [E. R. J., March 27, '09.]

SHOPS AND BUILDINGS

San José (Cal.) Railway.—This company announces that it is planning to build a car house and offices in San José. G. L. Barker, manager.

Toledo & Indiana Railway, Toledo, Ohio.—This company is said to have purchased property at Swanton, where it will erect a freight and passenger station.

POWER HOUSES AND SUBSTATIONS

Tide Water Power Company, Wilmington, N. C.—This company has recently placed an order for one 1000-kw Westinghouse-Parsons turbo-generator and one Alberger barometric condenser.

Everett Railway, Light & Water Company, Everett, Wash.—This company has placed a contract with the Stone & Webster Engineering Corporation for the construction of a substation which will be equipped with one 500-kw motor generator, switchboard and transformers.

City & Elm Grove Railroad, Wheeling, W. Va.—It is announced that this company is preparing plans for an addition to its power station.

Manufactures & Supplies

ROLLING STOCK

Newton Street Railway, Newtonville, Mass., will purchase 36 motors immediately.

Shreveport (La.) Traction Company has purchased 24 GE-89 motors to replace GE-1000 motors.

Columbus Railway & Light Company, Columbus, Ohio, is reported to be considering the purchase of 20 city cars.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, it is reported, will purchase seven passenger cars.

Pittsburg (Pa.) Railways is reported to be in the market for cars. They will undoubtedly be of some prepayment type.

Atchison, Topeka & Santa Fé Railway, Chicago, Ill., has ordered 2 all-steel gasoline motor cars from the McKeen Motor Car Company, Omaha, Neb.

Corning & Painted Post Street Railway, Corning, N. Y., will purchase three GE-800 motor equipments and two Brill 21-C trucks in the course of a few weeks.

Winona Railway & Light Company, Winona, Minn., has purchased four second-hand open and two closed cars from the Dorner Railway Equipment Company, Chicago, Ill.

Monmouth County Electric Company, Red Bank, N. J., purchased eight sets of trucks from the New York Car & Truck Company, Kingston, N. Y., to replace old equipment.

Sioux City (Ia.) Traction Company, mentioned in the Electric Railway Journal of March 27, 1909, as contemplating the purchase of six cars, denies that it intends buying or building any cars.

Buffalo Southern Railway, Gardensville, N. Y., is in the market for four sets of four-motor equipments which, it is reported, will be used on some second-hand cars the company intends purchasing.

Pittsburg, Harmony, Butler & New Castle Railway, Pittsburg, Pa., is reported to have placed an order for four interurban cars with the St. Louis Car Company. Peter Smith Company's No. 2 heaters are specified for these cars.

Atlantic & Suburban Traction Company, Pleasantville, N. J., mentioned in the Electric Railway Journal of Jan. 23, 1909, as contemplating the purchase of five cars, has ordered three double-truck cars from The J. G. Brill Company.

Grand Rapids (Mich.) Railway, mentioned in the Electric Railway Journal of March 27, 1909, as having ordered 12 cars from the St. Louis Car Company, advises that the American Car Company will build these 12 cars and that they will be of the pay-as-you-enter type.

Ithaca (N. Y.) Street Railway, mentioned in the Electric Railway Journal of March 20, 1909, as having purchased two double-truck pay-as-you-enter cars from The J. G. Brill Company, expects to purchase 10 more cars after trying out the two new cars under local conditions.

Saginaw & Flint Railway, Detroit, Mich., has ordered two cars from the Niles Car & Manufacturing Company, Niles, Ohio. These cars are to be similar in construction to the cars ordered from the same builders in November, 1908. They are to have an over-all length of 51 ft. and a seating capacity of 50.

Bakersfield & Ventura Railroad, Oxnard, Cal., mentioned in the Electric Railway Journal of Dec. 5, 1908, as contemplating the purchase of one gasoline motor car for interurban service on a proposed line, has ordered this car from Fairbanks, Morse & Company, Chicago, Ill. The car will seat 40, will weigh 10,000 lb., and will have a body length of 25 ft.

Shelburne Falls & Colerain Street Railway, Shelburne Falls, Mass., mentioned in the Electric Railway Journal of Feb. 27, 1909, as being in the market for a combination car equipment for hauling freight cars, has ordered one combination car from the Wason Manufacturing Company. The car will weigh 28 tons, be 34 ft. 4 in. long over all, 8 ft. 6 in. wide over all, have a 6-ft. wheel base, will seat 16 and will be equipped with Allis-Chalmers air brakes, M. C. B. couplers, Taylor (M. C. B.) trucks and four Allis-Chalmers type R-35 motors.

Lowell & Fitchburg Street Railway, Ayer, Mass., mentioned in the Electric Railway Journal of April 3, 1909, as having lost three large cars and a snow plow by fire, advises that two of the cars were of the semi-convertible type built by the John Stephenson Company, and equipped with four 93-A Westinghouse motors and Westinghouse

brakes; one was a large box car with four GE-1000 motors, K-12 controllers and National air brakes, and the plow was a double-truck Smith & Wallace nose plow with Westinghouse equipments. The company expects to replace the rolling stock destroyed.

Syracuse Suburban Railway, Syracuse, N. Y., reported in the ELECTRIC RAILWAY JOURNAL of March 27, 1909, as being in the market for three interurban cars, has purchased three semi-convertible passenger cars with smoking compartment from the G. C. Kuhlman Car Company. Brill 27-E trucks were specified. The cars will be 43 ft. 9 in. over crown pieces, 34 ft. 4 in. over end posts, and will seat 48. Forsyth curtain fixtures, Dedenda gongs, Retriever signal bells, Brill automatic doors, angle-iron bumpers, ratchet brake handles, Hovey draw-bars, Dumpit sand boxes and Brill Winner seats will be installed.

Omaha & Council Bluffs Street Railway, Omaha, Neb., mentioned in the ELECTRIC RAILWAY JOURNAL of March 20, 1909, as having ordered 10 cars from the American Car Company, has specified that the cars be of the pay-as-you-enter type, have a length of 41 ft. 4 in. over bumpers, a body length of 29 ft. 4 in., and a length over vestibule of 40 ft. 4 in. Other details of interest follow: Width over all, 8 ft. 7 in.; height inside, 8 ft.; sill to trolley base, 8 ft. 11¾ in.; ceilings, Agosote; curtain fixtures, Acme, Hartshorn rollers; curtain material, Pantasote; destination signs, Hunter; draw-bars, Tomlinson; headlights, Kirby-Neal; paint (manufacturer) Valentine; sanders, Nichols-Lintern; step treads, Mason Safety; varnish (manufacturer) Chicago Varnish Company.

Salt Lake & Ogden Railroad, Salt Lake City, Utah, has just sent out specifications for the 12 motor cars and trucks which it will purchase, as reported in the ELECTRIC RAILWAY JOURNAL of March 6, 1909. Bids are returnable for the cars April 10, and for the trucks April 12, 1909. The specifications state that the cars are to be of the three-compartment type, are to have an over-all length of 56 ft. and a seating capacity of 60 passengers. They are to have double-end control, two vestibules, monitor roofs, interior finish of solid mahogany with a general green and gold tone and hot-water heaters. The trucks are to be all steel and of the M.C.B. interurban type mounted on rolled forged-steel wheels. Each car is to be equipped with air brakes and four inside-hung 100-hp d. c. motors.

Long Island Railroad, Long Island City, N. Y., mentioned in the ELECTRIC RAILWAY JOURNAL of April 3, 1909, as being in the market for 120 steel passenger motor cars, advises that these cars will be 53 ft. long, will have transverse seats in the center, longitudinal seats at both ends, and be similar in every respect to the 50 trail cars now in service, built by the American Car & Foundry Company. The new cars will be equipped with Westinghouse Electric & Manufacturing Company's motors and Westinghouse Traction Brake Company's air brakes. The electrical and brake equipment for these cars was included in the contract made last fall by the Pennsylvania Tunnel & Terminal Railroad with the Westinghouse Companies for all apparatus required to complete the electrification of the Long Island Railroad and the tunnels under New York City.

Hull Electric Company, Aylmer, Que., mentioned in the ELECTRIC RAILWAY JOURNAL of Dec. 19, 1908, as being in the market for four closed cars and one snow sweeper, has just placed an order for June delivery with the Ottawa Car Company, Ottawa, Ont., for two single-truck, drop-sash closed cars, with a length over all of 30 ft., a seating capacity of 28 and equipped with Coleman fare boxes. Other details of interest follow:

Weight of car body. 13,000 lb.	Fenders ..... Providence
Wheel base .....8 ft.	Gears and pinions..Westinghouse.
Length of body.....21 ft.	Heating system.Consolidated
Over vestibule .....29 ft.	Headlights .. Crouse-Hinds
Width inside.....6 ft. 2 in.	Journal boxes ..... Brill
Over all.....7 ft. 6 in.	Motors, type and number, West. 101-B-2, two.
Height inside .....8 ft. 2 in.	Sanders ..... Ottawa
Height from top of rail to floor .....38 in.	Sash fixtures.....Ottawa
Underframe ... Combination	Seats...Longitudinal. Wilton carpet.
Axles ..... Brill	Steps ..... Stanwood
Brakes ..... Peacock	Trolley poles and attachments ..... Shelby poles
Car trimmings .....Forsyth	Trucks, type and make, 21-E Brill.
Control system..... GE	Special devices, Root snow scrapers.
Couplers...Ottawa Standard	
Curtain fixtures..Hartshorn rollers.	
Curtain material...Pantasote	
Destination signs ....Ottawa	

Union Traction Company, Sistersville, W. Va., mentioned in the ELECTRIC RAILWAY JOURNAL of April 3, 1909, as having purchased two 45-ft. closed cars and one 15-bench open car from the Cincinnati Car Company, has specified the two closed cars to be of the semi-convertible type to seat 48. Other details follow:

Weight ..... 20,000 lb.	Hand brakes ..... Peacock
Wheel base .....4 ft. 6 in.	Heating system.Consolidated
Length of body...33 ft. 4 in.	Motors..West. No. 306, four
Over vestibule....44 ft. 4 in.	Sanders...Cincinnati Car Co.
Width over all...8 ft. 6½ in.	Seats.....Hale & Kilburn "Walkover," leather covered.
Height, sill to base.....9 ft.	
Body,.....wood and steel	Trolley poles and attachments, U. S. Standard.
Underframe..wood and steel	
Air brakes.....Westinghouse semi-automatic.	Trucks .....Standard O-50
	Vestibule each end, with folding door.
Bolsters, body, steel built-up type.	
Control system .....K-type	Special devices..Push button system.
Couplers ..... Cincinnati	
Curtain fixtures..Forsyth, 88	Interior finish of mahogany, bird's-eye maple ceilings.
Curtain material..Crown, 580	
Gears and pinions....Nuttall	

The one open car will be 42 ft. 2 in. long over all and will have a seating capacity of 75. The details are the same as the two mentioned above except for the following:

Weight .....15,000 lb.	Curtain fixtures .....Climax
Length of body..33 ft. 6½ in.	Curtain material..... Duck
Width over all.....8 ft. 3 in.	Roofs ..Monitor, detachable type hood.
Height, sill to trolley base, 8 ft. 9¼ in.	Seats....Slat cross seats, reversible backs.
Body..Mal. iron, side panels	

San Francisco, Vallejo & Napa Valley Railway, Napa, Cal., mentioned in the ELECTRIC RAILWAY JOURNAL of June 27, 1908, as contemplating the purchase of some new cars, has ordered two combination cars from the Niles Car & Manufacturing Company, of Niles, Ohio. The cars have an over-all length of 56 ft., weigh 33,600 lb. and seat 54. Other details of interest follow:

Length of body...44 ft. 8 in.	Heating system, Johns-Manville Elec.
Over vestibule....54 ft. 8 in.	Headlights, Westinghouse 25 eyele
Width inside.....8 ft. 2½ in.	Journal boxes.....Symington
Over all.....9 ft.	Lavatory fittings.....Niles
Height, sill to trolley base, 9 ft. 6 in.	Markers ..... Armspear
Height from top of rail to sills .....3 ft. 5 in.	Motors, type and number, 132A a. c. Westinghouse
Body ..... wood	Registers ..... Ohmer
Underframe, steel I-beam, wood side sills	Roofs, monitor deck, No. 8 duck cover
Air brakes, Westinghouse AMM.	Sanders, Electric Heated Sand Box Co.
Car trimmings, bronze, Am. Car & Ship Hdw. Co.	Sash fixtures, Am. Car & Ship Hdw. Co.
Control system, Westinghouse unit switch	Seats, Hale & Kilburn white woven rattan
Couplers .... Gould M. C. B.	Side bearings...Perry roller
Curtain fixtures, Hartshorn spring rollers	Springs .....Triple elliptic
Curtain material.. Pantasote	Step treads, corrugated rubber
Gears and pinions...Nuttall	Trucks, type and make, Baldwin,. No. 315
Gongs, 14-in. Niles Car & Mfg. Co.	
Hand brakes, Peacock, bronze ratchet	

TRADE NOTES

Standard Underground Cable Company, New York, N. Y., has removed its New York office to 50 Church Street, Hudson Terminal Building.

National Lock Washer Company, Newark, N. J., advises that the Oakland Traction Company, Oakland, Cal., has ordered National car curtains and curtain fixtures for the 20 cars it is building.

Wagner Electric Manufacturing Company, St. Louis, Mo., announces that J. F. Jones, formerly of the transformer department of the Fort Wayne Electric Company, has accepted a position in its transformer sales department.

Perry Ventilator Corporation, New Bedford, Mass., advises that it has received an order from the Pressed Steel Car Company to equip with its ventilators the 90 new cars recently ordered by the Hudson & Manhattan Railroad Company.

J. G. White & Company, Inc., New York, have opened a branch office in the Alaska-Commercial Building, San Francisco, Cal. Henry A. Lardner, who has been prominently connected with this company for many years, will be in charge as manager.

Jordan Brothers, Inc., New York, N. Y., recently received an order from the Public Service Corporation of New Jersey for a G.E. type H-C, Class 6, 500-500 form M rotary converter, 500 r.p.m. continuous current, 834 amp., 600 volts a.c., 25 cycles, for the Montclair substation.

Crocker-Wheeler Company, Ampere, N. J., reports that business booked during March showed improvement over February. The greatest improvement was shown in motors for the printing trade and the steel industry, although all classes of business manifest some betterment.

The J. G. Brill Company, Philadelphia, Pa., is reported to have increased the working force at its Philadelphia plant to 1800 men as a result of increased orders from home and foreign companies. Other plants of the company are said to have enough work on hand to employ about 50 per cent of the maximum forces.

Baldwin Locomotive Works (Burnham, Williams & Company) and the Standard Steel Works Company, Philadeplhia, Pa., have moved their New York offices to No. 1982 Hudson Terminal Building at 50 Church Street. The New York representatives of both companies are Harry W. Sheldon and Frederick W. Weston.

Mica Insulator Company, 68 Church Street, New York, advises that its business has improved considerably during the last few months. The demand for insulation is increasing and several large electric railways are purchasing in quantities. The company recently received several orders for its products from electric railways.

Robins New Conveyor Company, New York, N. Y., has leased 72 Front Street, New York, and on April 1 removed its offices from 38 Wall Street to this new location. The machinery of the factory is now being removed into the new quarters as rapidly as possible. Greatly increased facilities are provided, particularly for the manufacture of laminated leather belting and Balata belting.

Champion Oil Company, Chicago, Ill., announces that L. C. Almy, who has had an extensive experience in the electric railway field, has been appointed special demonstrator for the company. For the past 18 months Mr. Almy has been master mechanic of the Elgin & Belvidere Electric Company, at Marengo, Ill. Previously he was employed as superintendent of rolling stock by the Philadelphia Rapid Transit Company and for five years was associated with the Metropolitan West Side Elevated Railway in Chicago.

General Railway Equipment Company, 1535 Old Colony Building, Chicago, Ill., is a company recently organized to sell new and second-hand railway rolling stock for use in the construction and operation of steam and electric railways. The company has a capitalization of $100,000. I. J. Kusel, formerly vice-president and general manager of the American Car & Equipment Company, is president and general manager; T. C. McCalla is secretary and treasurer, and W. A. Campbell, formerly in the sales department of the Hicks Locomotive Works, is sales manager of the company.

Dossert & Company, Inc., 242 West Forty-first Street, New York, received an order from the Central Electric Company of Chicago, Ill., for 1000 Dossert solderless lugs. The order also includes about 100 Dossert solderless cable taps. Orders have also been received from the San Francisco representative of Dossert & Company for large cable taps and lugs for use on the heavy cables of the Great Western Power Company in California, and from the Illinois Tunnel Company for 1000 cable taps, reducers and special terminals for the wiring of the signal service in the Chicago subway.

National Brake Company, Buffalo, N. Y., announces the establishment of agreements with the following foreign agencies for the sale of the Ackley adjustable brake: Albanese & Reiss. 85, rue St. Lazare, .Paris, France, for France, French colonies, Spain, Portugal, Egypt and Greece; Schmassman & Company, 110 Bahnhofstrasse, Zurich, Switzerland, for Switzerland and Italy; Kontinentale Bremsen-Gesellschaft m. b. h. (vorm Bockerbremsen) 31 Charlottenstrasse, Lankwitz, Germany, for Germany, Austria and Russia; C. Dubbelman, 45 rue de la Caserne, Brussels, for Belgium, Holland, Denmark, Norway and Sweden; The Equipment & Engineering Company, Northampton Park, Canonbury, London, N. E., for England, Ireland, Scotland and Wales.

E. H. Stevens has resigned as general superintendent of plants of the Public Service Corporation of New Jersey, to become vice-president and general manager of the Bird-Archer Company, 90 West Street, New York. During his 15-years' experience in power-plant operation, costs and management, Mr. Stevens has had complete charge of plants aggregating several hundred thousand horse-power, and is therefore exceptionally well prepared to deal with questions about feed-water treatment. Mr. Stevens' genial disposition, courtesy and engineering ability have won for him the respect and esteem of all with whom he has come in contact, and his many friends wish him all success in his new work. During the past five years Mr. Stevens has used the Bird-Archer Company's compounds exclusively in the plants of the Public Service Corporation and is well informed as to the results that can be secured by using boiler compounds. Mr. Stevens will have complete charge of sales, and will give his personal attention to inquiries from large plants which have heretofore shown serious economy losses and high operating costs on account of the scale, oil deposits and other troubles caused by bad feed-water.

ADVERTISING LITERATURE

Darley Engineering Company, New York, announces Bulletin No. 2, on suction conveyors.

Sellers Manufacturing Company, Chicago, Ill., has printed a booklet on tie-plates and angle bars.

American Blower Company, Detroit, Mich., has issued an illustrated booklet with tables on the Sirocco fans.

American Railway Supply Company, New York, N. Y., has issued a little folder entitled "Time Checks and their Use."

Dean Brothers Steam Pump Works, Indianapolis, Ind., have issued catalog No. 72, listing and illustrating their hydraulic-pressure pumps.

F. Bissell Company, Toledo, Ohio, bears on its April calendar card a miniature closepin to signify the company's hold on its patrons by the prompt supply of good material at right prices.

Poole Brothers, Chicago, Ill., have just issued their 1909 illustrated catalog of ticket cases, dating stamps, conductors' punches and other light railway supplies used by electric and steam railways.

Joseph T. Ryerson & Son, Chicago, Ill., have issued an illustrated description of their iron and steel warehouses, showing their facilities for handling sheet steel, plate, bars, rivets, steel working machinery, etc.

N. W. Halsey & Company, New York, N. Y., are distributing a small circular, "Municipal Bonds," in which the evolution of municipal indebtedness and the safety and market for municipal bonds are considered.

Goldschmidt Thermit Company, New York, is distributing a booklet on thermit welding of castings and forgings. Among the applications shown are the welding of motor castings, truck frames and armature shafts.

Niles-Bement-Pond Company, New York, has printed a large catalog on heavy milling machines. The company has also published a large illustrated catalog on various forms of single and double-frame power hammers.

Jeffrey Manufacturing Company, Columbus, Ohio, has printed a catalog describing the lock-jaw track wrenches made by its forge and foundries department which was recently organized to make specialties of this kind.

Percival Wood Preserving Company, Houston, Tex., has printed an interesting pamphlet on its air-seasoned, open-vat method of treating timber for railway and other purposes. The pamphlet contains a number of large illustrations and commendatory letters from users of timber treated by this company's methods.

Westinghouse Electric & Manufacturing Company, Pittsburg, Pa., announces the following bulletins: No. 1160, Multiple Tungsten Lamps for A.C. or D.C. Circuits, and No. 1164, on Type M.S. Mill Motors for Polyphase Circuits. It has also prepared a booklet called "Motor Talks No. 4," which contains a table for finding current in a three-phase circuit.

General Electric Company, Schenectady, N. Y., is distributing Bulletin No. 4653, describing in detail the latest forms of the Curtis steam turbo-generator. It is also distributing a small pamphlet, No. 3768, listing motor-starting and speed-controlling devices. It has also recently issued the following publications: Bulletin No. 4654 on section switches and Bulletin No. 4655 on electric hardening switches, together with pamphlets on bell-ringing transformers, tantalum lamps for train lighting and extension diffusers.

McGuire-Cummings Manufacturing Company, Chicago, Ill., has just issued a catalog descriptive of the various electric railway sprinkling cars made by the company. These include the pneumatic, which can be used for sprinkling or flushing streets and for fire protection purposes; the turbine sprinkler, which supplies water through the medium of a centrifugal pump which is driven by a direct-connected motor, and the gravity sprinkler, which depends upon gravity entirely for its distributing power and is recommended for use where it is desired to sprinkle a distance of 9 ft. each side of the center line of the track.