

Street Railway Journal

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During 1907 the Street Railway Journal printed and circulated 427,250 copies, an average of 8216 copies per week. Of this issue 7500 copies are printed.

Affiliations with Public Organizations

In many cities electric railway managers are personally members of one or more social clubs or business organizations. Aside from the natural pleasure which belongs to most associations of this character there is no doubt that the welfare of the operating companies is fostered by friendly relations between their representatives and the citizens of standing in the communities served. The oppor-

tunity which intercourse of this character affords for frank discussions of a company's policies, friendly criticisms of methods and explanations too likely to be misconstrued by less well-informed persons is not to be lightly passed by. An opportunity sometimes exists for a company as a whole to belong to a chamber of commerce or board of trade, having an active voice and vote in matters of public interest and being ranged on the side of progress and the general welfare of the town. In some places there is an attitude of antagonism on the part of these commercial bodies to the local transportation company, and many chafing and onerous regulations brought to bear by the local authorities can in such cases be traced to the misunderstanding of the situation by these organizations. Where the company is a member there is always a chance for these misunderstandings to be smoothed away, and the opportunity to join hands with men engaged in work of broad improvement is, if made the most of, certain to lead in the long run to a friendly attitude on the part of the influential citizens of the town, when franchises or permission to engage in other work of betterment are desired. Surely the electric railway, touching as it does almost the entire population of a city, has as much reason to belong to the general welfare bodies as a dry goods merchant or a wholesaler.

Car Lighting

It is with all due deference to our friends that we again take up the question of car lighting, which seems to be at present in a state that, to put it gently, admits of some improvements. Those who have made a specialty of illumination and certainly all oculists are practically agreed that the filament of an incandescent lamp is too brilliant safely to be allowed fairly before the eyes. Not only is it too bright, but in virtue of its intensity it does not give the eye a fair chance to utilize it, since the iris closes up under the over-severe stimulus. Most street railway companies are amply liberal in the amount of light supplied, recognizing the common desire of mankind to read the stock reports on his way home and, in fact, there is seldom any trouble with the quantity of the light unless there is trouble on the lines. But, as a rule, the lights are just where they stare the passenger full in the face and really to no small extent defeat their own aim. Two-thirds of the amount of light properly placed and shaded would quite certainly give a better and pleasanter illumination by which to read, in addition to the obvious gain of saving a very considerable amount of energy.

It would perhaps be impracticable to change over existing cars—tinkering with cars is a rather troublesome and unsatisfactory job, but in getting new cars might it not be wise to try for something better than is now in use? The main point is to screen the eyes from the intense

brilliance of the filament. Of course, frosted lamps would accomplish this simply enough. Their effective life is, however, naturally shortened by frosting, which increases the cost of renewals. Equally good results could be secured by the use of diffusing shades, which need not be large, and give ample protection. The exact form of shade would depend on the position in which the lights were installed. Lights on one's own side of the car at the edge of the monitor roof or nearer the sides do not shine into the eyes, and the chief point is to keep them shaded from the opposite side of the car and from those who stand. This could be accomplished by a small and fairly deep shade of a comparatively inexpensive character. With the lights in the monitor roof the task is more difficult, but a properly shaped, fairly deep shade and a lamp frosted merely at the tip would be a workable combination. It is a plan at least worth trying in new cars. The result would certainly be better lighting, the first cost would not be material and the saving in energy possible would probably more than make up for it. It would be an improvement especially welcome in interurban cars and elsewhere where long runs are made, and on cars with cross seats improved lighting should be easier than on the ordinary kinds. Such little improvements all tend to increase traffic particularly where there is competition with steam roads to be encountered.

Improving Service at Intersection Points

In the operation of large street railway systems the maintenance of a reasonably accurate schedule is one of the most desirable features of good service. Freedom from delays is scarcely less necessary on small roads, but the cumulative effects of slow service are so much greater on a system handling hundreds of cars that the cost of operation is much more affected by apparently trifling causes than is the case on lines operating a comparatively small number of cars. Just as minute details of car design affect the character of the entire service through their influence upon multiplied passenger units, so are the minor causes of delay on crowded tracks of great importance taken as a whole.

Difficult as it is to control these factors, something can be done if the movement of the cars is regulated according to definite plans. Recent work in the control of street traffic in large cities should ultimately be helpful in reducing delays of cars as well as vehicles, and the co-operation of railway managers with local authorities in formulating traffic rules suitable to the conditions in each city is much to be desired. As far as the street railway company is concerned, the location of stopping points and the handling of cars at intersections and in other special track work are the chief problems to be solved. The location of tracks is of much importance in the first place, but this is so restricted a matter in the great majority of cases that the congestion problem must minutely be dealt with from the company's standpoint in connection with stops and car movements through special work.

Rights of way should always be definitely fixed in the operating rules in force. Some judgment is inevitably required in handling approaching cars at intersection points, but the nearer the cars come to the fouling point the more

essential it is that there shall be no dispute as to which has the right of way. The practice of many companies giving the inbound car the precedence in approaching the business center is found to work out well, and similarly, cars approaching a steam or electric railway terminal should invariably be given the right of way. We have frequently commented on the wisdom of providing a more elastic service to important railroad terminals, and there is certainly much room for improvement in the actual track layouts existing near such stations in some cities. As far as is feasible, complicated trackage should be avoided when approaching an important station. There is little doubt that an excessive number of slow-downs and stops interfering with smooth approaches to stations where time is a vital factor in the choice of a street car or a hack, works out to the distinct disadvantage of the trolley system in the long run. Where special track work is unavoidable, the use of an electric track switch or the location of a switchman at intersections that pass a heavy traffic will generally be advantageous. Many roads appreciate these points, but in other cases little attention has been paid to the matter.

By care in the location of pole stops at or near intersections the movement of traffic can be expedited. If the pole stop in approaching a crossing is placed just before coming to the first track, a double stop can usually be saved. Clear marking of pole stops for both day and night service pays in reduced delays. When a car is to take a switch at a choice of routes, it is better to place the stopping point beyond the facing point switch, so that succeeding cars can clear the approach to the switch, in many cases leaving the main line free for the principal traffic stream. In approaching a main line track from a branch the stop can best be made before reaching the more congested rails.

Construction and Maintenance Problems

The present pause in the carrying out of new industrial projects is reflected in the field of electric railway construction by the absence of other development than those planned many months ago. With the return of normal conditions in the railroad world, the need of increased capacity will surely be very strongly felt. Already there are signs that the point of least traffic has been passed, and a steady acceleration of business is to be expected as we get farther and farther away from the financial disturbance of 1907. In the absence of construction problems many managers have been wisely paying special attention to maintenance during the last few months. In fact, since the beginning of the new year operating men have seen an exceptionally good opportunity to take care of those repairs which could be only partially completed under the heavy stress of work connected with extensions, which has been common for the past few years.

Taking care of ordinary maintenance, however, will not be sufficient to meet the situation of the near future in the handling of the increasing traffic which is evinced in the February reports of many roads. In two directions the problem of greater capacity must be faced. The railway companies must be able to raise sufficient capital to carry out the needed improvements and the public must realize that these improvements cannot be had unless the hostile

attitude so much in vogue gives way to a saner appreciation by the people of the honest efforts of progressive companies to give first-class service. In other words, the potential demand for increased facilities is already very great, but in just so far as the unthinking public refuses to meet the companies squarely by just so much will the completion of improvements of any magnitude be retarded.

In the matter of the electrical equipment of steam railroads, for instance, there is practically the same need of improved motive power in the railroad suburban service of the great cities of this country now that existed a few months ago. But in not a few cases electrification appears even farther away than it did last year. The same is true of the subway situation in New York and in a corresponding though less degree of the transportation systems in practically all of the large cities. The public interests are suffering from lack of transit facilities, the community is undergoing inconvenience and the transportation companies are losing business which they would be glad to take care of, all on account of the attitude taken in high quarters against public service corporations.

Hostile legislation, unfair attacks for political purposes, a disposition to withhold financial support from expansion projects of merit, antagonism by sensational newspapers and a general attitude of corporation baiting on the part of the public will do more to hold back the great improvements so much needed than any attitude of conservatism at present held by the stockholders and operators of the railroads themselves. But there are evidences of a revulsion of sentiment toward saner methods and a policy of encouraging needed transportation enterprises. The public as a whole and those in charge of our municipal and State governments in particular should realize that a considerable portion of the people now hold to views which are directly in favor of legitimate improvements by public service corporations. The number of converts to the theory that a policy of fair, even liberal, treatment to public service corporations must be adopted if the investment of further capital is to be expected of them, is increasing. Nothing is clearer than that the adoption of this plan would be a potent factor in bringing about the widespread development of improved methods which is so essential to the progress of material civilization. Is not a business policy worth trying?

Progress in Concrete Construction

The extraordinary spread of concrete construction within the past few years has piled up problems faster than it has been possible to solve them completely, and it is by no means clear as yet what is always the best use to make of the admirable material now available. No other material for building is so facile in application, so reliable when well made or so shabby and treacherous when badly made. There will be a day of reckoning for the buildings constructed of some of the stuff that one can see going into structures to-day in many cities. Mr. Edison's scheme of cheap concrete houses made in standard molds is a most attractive possibility if well carried out, but in the hands of a reckless contractor what would one get? The idea of a monolithic dwelling formed on the spot appeals to the imagination, yet it may be a question whether one really wants a monolith for such purposes. Truth to tell, the practice of concrete structures seems at the present rather

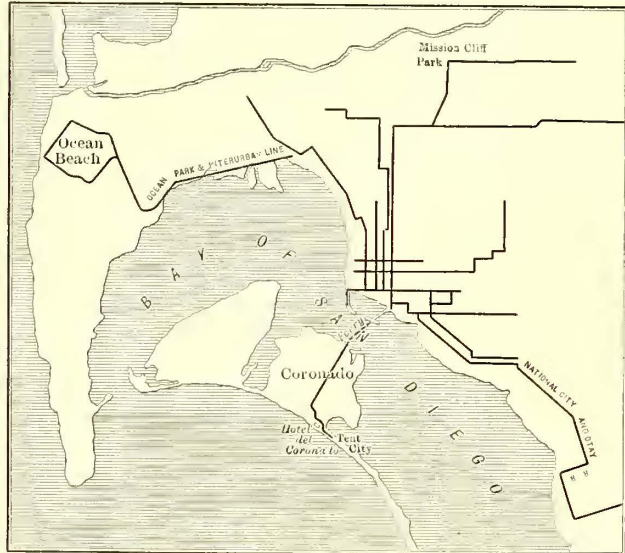
crude in some respects. The material can be molded with such care that there is a tendency to use it injudiciously; in fact, from now on the study of the engineer should be not how to "do stunts" with plain or reinforced concrete, but how to discover the conditions of maximum economy in employing a very cheap and useful material.

For many purposes a solid wall of reinforced concrete is not particularly desirable, nor is it altogether easy to get a uniform good quality. It strikes the thoughtful observer that with stuff like concrete the possibilities of hollow block construction ought to be more generally recognized. Brick, that reliable standby of the centuries, has held its own with minor changes in size and shape since Babylon was young. But within the century past the conditions in the building trades have changed very radically. Labor has become relatively much more costly than ever before and labor-saving methods have become correspondingly more important. The steam hoist has superseded the hod-carrier and the ladder, but the bricklayer holds his own with the same old bricks. Has anyone ever made a thorough study of the conditions of maximum economy in constructing a built-up wall? The concrete block men have done something already, yet there is much more to be done. It should be entirely possible to develop a standard hollow concrete brick of such shape and dimensions that it could be laid and perhaps even interlocked as well as set in mortar, at a rate that would set an entirely new pace in construction. The concrete block has a tremendous advantage over any form of hollow tile in that it can be made accurately to dimensions so as to minimize the amount of fitting.

More than this, there are very many parts in simple building that can be reduced to standard or quasi-standard forms so as still further to reduce the all-important labor item. Reinforced beams and arches can be made from interchangeable forms with great facility, and reinforced floor plates with details for interlocking should be almost as easy. For ordinary house building such construction is to-day in its infancy and its possibilities are almost limitless. A good fireproof construction for houses and small shops would save yearly enormous losses. The columns of our engineering papers are rich in data on concrete construction, and there are a few journals which are mainly devoted to concrete houses and small buildings, but the usefulness of concrete in one form or another for structures of small to moderate size is not generally appreciated. Lumber is yearly getting scarcer and higher in price, and labor of the better sort is yearly more expensive. These facts make it highly important to look to the future and to evolve the art of using cheap materials in the most economical manner for shops and barns and power plants as well as houses. Some day the problem will be worked out, and the sooner the better. It is not going to be done by a cut-and-dried system, but by shrewd and resourceful engineering, using, very likely, blocks, standard molds and monolithic parts formed on the spot as may be in each instance cheapest for the work in hand. Meanwhile the art of concrete mixing will advance so as to get cheaper, more uniform and more reliable material. Architects and engineers have not yet discovered half the possibilities of judiciously used concrete.

THE STREET RAILWAY SYSTEM OF SAN DIEGO, CAL.

The city of San Diego is in the extreme southwestern part of California, on the Pacific Ocean and close to the Mexican border. Its climate is remarkably equable, and this condition, coupled with the small amount of rainfall and the seaside location of the city, has made the latter famous as a resort during all of the year. On the other hand, the commercial advantage of the city is great, as it



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MAP, SHOWING ELECTRIC RAILWAY SYSTEM IN SAN DIEGO

is on San Diego Bay, one of the few good harbors on the western coast of this country. Owing to various causes this harbor has not been utilized to any great extent until recently, but during the last five years the amount of commerce handled through the port has increased considerably and the population has been doubled.

The street railway system of the city, when acquired by the San Diego Electric Railway Company in 1903, was entirely antiquated. It comprised about 17 miles of track, twenty single-truck cars, a power house, the equipment of which had been in service for over eleven years, and a car house and shop. Since then the trackage system has been entirely rebuilt, the old cars have been replaced and modern equipment installed in the power house. The city lines of the company have also been extended materially and an interurban line is now operated in connection with the system.

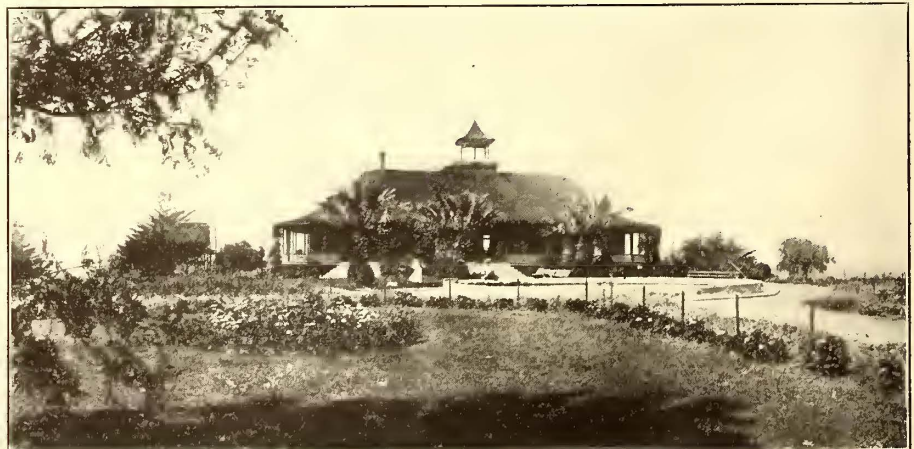
The company has at present over 35 miles of track, including the city lines and a line on the peninsula, which separates the bay from the ocean. The city lines radiate from the central business section to the various outlying residence districts. One of them also extends to a ferry slip on the bay shore, where it connects by a ferry across the bay with the line on the peninsula. The interurban line was formerly the National City & Otay Railroad, a steam road extending south along the bay from San Diego across the Mexican border. This road has been electrified for 10.6 miles, through National City and South San Diego, and the electrification will be extended to the end of it,

about 7.4 miles farther. Another interurban line is to be built around the north end of the bay to Ocean Park, a shore resort on the ocean. Part of the material for the construction of this line is already in San Diego.

Aside from the steady regular passenger business produced by the resident population, a heavy traffic is created by the large numbers of tourists who visit the city. The same interests which control the street railway system also own and operate the famous Hotel del Coronado and the Coronado Tent City. These two seashore resorts are close together on the seaward side of the peninsula between the ocean and the bay, where a long, low sandy beach exists, and produce a large volume of traffic for the street railway system, as the line on the peninsula operating in connection with the ferry across the bay is the most direct and practically the only way to reach the city. The town of Coronado, with a population of about 1200 permanent inhabitants, lies between the hotel and the ferry, and is also dependent on the latter and on the line on the peninsula to reach the city.

The company has also developed Mission Cliff Park, a botanical and zoölogical garden, at the end of one of the principal city lines. An excellent view of the city and the bay is obtained from one side of this park and a broad stretch of country may be seen from the other side. The park contains a large recreation pavilion, a collection of animals and has flower gardens which grow in remarkable profusion, due to the climate. A private ostrich farm adjoining this park is also a source of considerable interest to tourists.

The improvements to the system since the latter was acquired by the San Diego Electric Railway Company have been required as much by the remarkable increase in the volume of traffic handled as by the depleted condition of the old system. For the year 1903 the traffic on the city system amounted to a few thousand less than 3,000,000 passengers. Since then the traffic has been growing rapidly,



MISSION CLIFF PARK AT THE END OF ONE OF THE CITY LINES

having reached a total of over 7,200,000 in 1907, or more than 140 per cent of the traffic in 1903 and 1,700,000 more passengers than were carried in 1906.

The tracks of the system as reconstructed have 60-lb. T-rails laid to a 4-ft. 8½-in. gage on California redwood cross ties. Since the average annual rainfall is only about 7.5 in. and the soil is quite porous, dirt ballast is used on most of the tracks with satisfactory results. Two of the principal streets in the city have, however, recently been paved with asphalt for several miles from the central busi-

ness district, and on these streets the tracks are laid in the concrete base for the pavement.

The rolling stock consisted of twenty single-truck small cars when the improvements were started in 1903. These cars have all been rebuilt since then in the shops of the company. The larger ones have been lengthened and placed on double trucks; the shorter ones have been overhauled completely and provided with new ends. Meanwhile,

although at both ends the windows are omitted, following the general type of the cars used in the city. These interurban cars have two type 27-E-1 Brill trucks, each carrying two 37-hp General Electric type 67 motors. They are arranged for double-end control with General Electric type K-10 controllers, and have Westinghouse air-brakes.

The contract for six new cars for the interurban line has recently been awarded to the Niles Car Manufacturing



CORONADO TENT CITY AT THE HEIGHT OF THE SEASON

twenty-one modern cars, specially adapted to the traffic conditions of the system, have been built in the company's shops.

The bodies of these new cars are 34 ft. long over all and have a seating capacity for thirty-six passengers. They have an open seating space at each end, with an enclosed space at the middle, and are similar to the type generally employed for city service in California, as shown in an accompanying reproduction. Each car has two 27-G Brill trucks, each carrying two 37½-hp General Electric type 67 motors. The cars are wired for double-end control and are equipped with two type K-10 General Electric controllers. With the exception of the cars on the peninsula, which are equipped with Westinghouse air-brakes, the cars have hand-operated, direct-acting lever brakes.

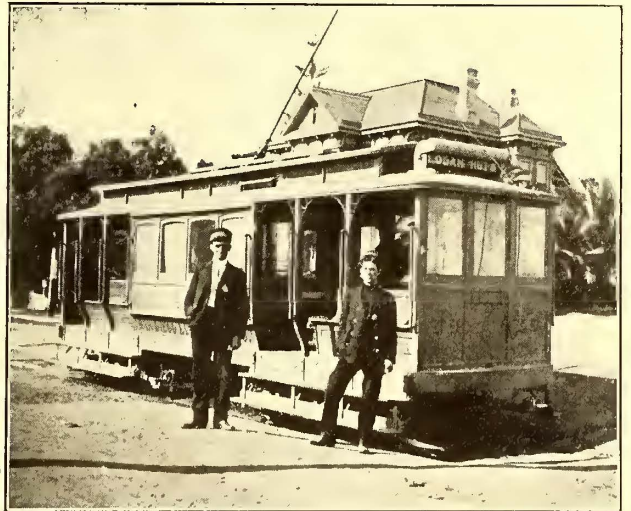
The under-frame used in building all of the new cars consists of Douglas fir side and cross sills, with oak end sills. The two side sills are each reinforced with a 7/8-in. x 8-in. steel plate, which is placed vertically and extends the length of the under-frame. These plates have been found to effectually hold the under-frame level. The upper framing of the cars is all of hard wood, except poplar sheathing used for the sides of the closed portion of the body. The ceilings are finished in maple and the whole car body is thoroughly finished and well painted.

The cars are built in the shops of the company at a cost of \$300 to \$500 a car less than they would cost if purchased in the East and delivered by rail, owing to the excessively high freight rates on materials so delivered. The cars are generally built in sets of six, in order to systematize their construction. The work is done by the regular employees of the company, only a few extra men over the regular repair and reconstruction gang of carpenters and painters being required. On the average, about one car a month is finished in the company's shops.

The cars used on the interurban line are rebuilt passenger coaches of the steam road and were made in the shops of that line. They have bodies 51 ft. long over all and seat fifty-six passengers. The bodies of these cars are closed,

Company, Niles, Ohio. These cars are to be of the California type, with bodies 45 ft. long and 8 ft. 8 in. wide, carried on two 27-E-1½ Brill trucks. The bodies are to be made with seven windows and six openings on each side, three of the openings being at each end. The windows are to be in the closed section, the latter being entered through double doors on Wallace fixtures.

The under-frame is to have 6-in. x 8-in. yellow-pine side sills, reinforced with 3/4-in. x 8-in. steel plates, bent around



STANDARD CITY CAR IN SAN DIEGO

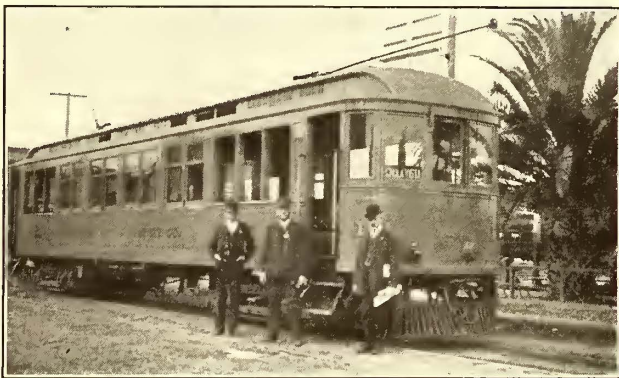
the step openings. The cross joists and the sills are to be white oak, the end sills each being reinforced with a 1/2-in. x 6-in. steel buffer plate. The floor is 7/8 in. x 3-in. tongue and groove maple laid lengthwise without floor-mat strips. The corners of the frame of the closed section are to have 4-in. x 5-in. side posts with 3-in. x 4-in. posts between the windows. The sides of the body are to be 5/8-in. poplar, but the framing is to be ash or long-leaved yellow pine. The roof is to be of the steam railroad coach pattern, the full length of the car, with a ventilator sash on each side.

It is to be strengthened with steel carlings bolted to wooden carlings between every ventilator sash. The inside finish is to be cherry, including doors, trimmings and mouldings, with ceilings of three-ply maple.

The seats inside the closed section are to be of the 34-in. Hale & Kilburn rattan walk-over type, seven on each side. Those outside are to be of the 34-in. Hale & Kilburn cherry slat walk-over type.

Each car will have two 27-E-1½ Brill trucks with 6-ft. wheel base; 33-in. wheels with 4-in. tread and 1-in. flange being used. Each truck will carry two 50-hp Westinghouse compensating-pole motors. Westinghouse air-brakes will be used.

Power to operate the city system and the interurban lines is furnished from one central station. The generating equipment of this station in 1903 consisted of four generators, one of 200-kw, one of 225-kw and two of 90-kw



NATIONAL CITY & OTAY RAILROAD INTERURBAN CAR

capacity each, which were driven respectively by a Risdon-Corliss engine and a Ball cross-compound engine. These units are now operated only in an emergency, as three turbo-generators have been installed. A Westinghouse-Parsons steam turbine, direct-connected to two 500-kw, 600-volt, direct-current Westinghouse generators was the first of the new units to be purchased. This unit has been in continuous service for over two years and is believed to be the first one of this type to be operated commercially. When the turbine was examined after twenty-two months of continuous service it was apparently in as good condition as when new. Steam is supplied to the turbine at 175-lb. pressure and the unit operates at 1500 r.p.m. A vacuum of 29 in. is maintained by a Worthington dry-air pump operating in connection with a Worthington surface condenser placed directly under the turbine.

The other two units consist of a pair of 500-kw, 2300-volt, alternating-current turbo-generators placed on one foundation. These units are arranged to be operated separately or in series. They are both served independently by one Worthington surface condenser with 3600 sq. ft. of cooling surface, as Worthington dry-air pump also being operated in connection with this condenser. Two 6-in. Byron Jackson centrifugal pumps, each direct-connected to a 30-hp motor, are placed in a pit under the floor and deliver salt water from the bay for cooling purposes. Two 22½-kw steam engine-driven exciters are installed in connection with the pair of 500-kw units, either of these exciters having sufficient capacity for both units.

The alternating current delivered by the pair of 500-kw units is utilized in either or both of two 500-kw Westinghouse motor-generator sets to generate direct current at 600 volts. Induction motors have also been installed to drive both of the original generators of the station. A considerable amount of current is also furnished from the

station for commercial power purposes in the city. During the day this is obtained from the main units; a 75-kw Ball generator, direct-connected to a 100-hp high-speed Ball engine has been installed to provide for this service between midnight and 5 a. m., when no cars are operated and the main units are shut down.

The original boiler equipment of the power station consisted of three 103-hp Babcock & Wilcox water-tube boilers. These were augmented in 1905 by three 250-hp Keeler water-tube boilers, making 750 hp in all. Recently four Cahall water-tube boilers have been installed, two single settings having a capacity of 250 hp each, and two of 400 hp each, in a battery, making a total of 2050 hp available. All of these boilers are fired with California crude oil. The first three boilers installed have Leahy oil-firing nozzles arranged to fire from the front, while the recent boilers have Hammel nozzles, which deliver a flame from the rear of the fire box toward the front of the setting.

In addition to the barn, carpenter, painting, repair and blacksmith shops in the building adjoining the power house, is a fully equipped machine shop. Since freight rates on repairs purchased in the East are high and deliveries uncertain, most of the repairs, including the re-winding of motors and similar work, are made in the various shops.

The officials of the San Diego Electric Railway Company are as follows: J. D. Spreckels, president; William Clayton, vice-president and managing director; Harry L. Titus, secretary, treasurer and attorney; B. M. Warner, general superintendent, and A. H. Kayser, general auditor. This journal is indebted to Mr. Warner for the data from which the foregoing notes have been prepared.

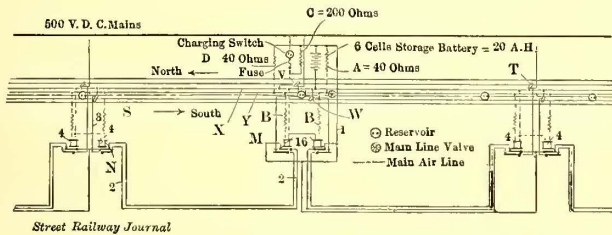
BAVARIAN RAILWAY ELECTRIFICATION

The Bavarian Government has just announced its intention to electrify part of the State railway system, utilizing a portion of the abundant water power of the country for this purpose. A few branch lines will be first dealt with, and should the experiment prove successful the scheme will be extended, though so far it has been impossible to obtain the sanction of the Imperial military authorities for the conversion of the main lines. The line from Berchtesgaden to Reichenhall and Salzburg, a distance of about 40 kilometers, will be worked by power derived from the Saalach. The cost of the power station will be \$375,000, about 5000 hp being developed. Another length to be proceeded with is that between Garmisch and Griesen, a distance of 9 miles. About 20,000 hp will be developed, and provision for extending the line is to be made. The cost of the central station here will be \$315,000, and a further \$215,000 will be spent on the line. Twelve electric locomotives are being purchased at a total cost of \$180,000. The question of railway electrification is also being seriously taken up by the Baden Government.

There has been organized among the employees of the Georgia Railway & Electric Company system the Georgia Railway & Electric Employees Association, which begins with 500 charter members. W. H. Glenn, manager of railways, is president. G. B. Sisson is secretary. G. W. Brine is treasurer. The dues of the association, whose membership is composed mainly of motormen, conductors, linemen and the like, are 50 cents a month, or \$6 a year, if paid in a lump sum. With this fund the association is prepared to pay its members \$1 a day when sick; furnish free medicine and free physicians. In case of death by accident or sickness a beneficiary is to receive \$100.

AUTOMATIC BLOCK SIGNALS ON THE CHICAGO SOUTH SIDE ELEVATED

The South Side Elevated of Chicago completed the reconstruction and third-tracking of its main line structure from Twelfth Street south to Forty-third Street late last spring and inaugurated express train service over the middle track during the rush hours, north bound in the morning and south bound at night. Recently the express service has been extended throughout the day by running north bound Englewood trains on the express track from Indiana Avenue to Twelfth Street between 10 a. m. and 2 p. m., when south bound express service is begun. While the line is fairly straight with no sharp curves to obstruct the view of motormen, except at Fortieth Street, it was not thought safe to operate high speed express trains at



TYPICAL CIRCUIT FOR AUTOMATIC BLOCK SIGNALS—
SOUTH SIDE ELEVATED RAILROAD

intervals of two minutes or less without block signals. A system of automatic electropneumatic signals was therefore designed and installed by the Union Switch & Signal Company, Swissvale, Pa., providing protection for train movements in either direction on the middle track only.

The system was originally designed for intervals of two minutes between trains. After the express service was put in operation, however, it was found necessary to decrease the interval between trains to one minute or even less in order to handle the traffic. The length of the blocks was accordingly reduced one-half and nearly double the number of signals originally planned were installed. The signals are spaced an average distance of about 1300 ft. apart, except at curves and terminals, where the speeds are slower. The blocks approaching Twelfth Street, for example, are 1477 ft., 825 ft., 795 ft. and 400 ft. long. In general the signals for north bound and south bound movements are grouped together and mounted opposite each other on the cable boxes between the express and local tracks. In some cases it was necessary to separate them from 75 ft. to 100 ft. on account of bridge girders obstructing the view. At crossovers, of which there are three, not including the interlocking at Indiana Avenue, the switches in the local tracks as well as in the express track are protected by automatics. In all 42 automatic signals have been installed.

The system as installed is a simple normal clear block signal system without distant protection or overlaps. Single-rail direct-current track circuits are employed, current being obtained from storage batteries charged from the third-rail through 200 ohms of resistance. These batteries give a nearly constant voltage in the track circuits regardless of fluctuations in the third-rail potential. In this respect the system differs from that installed on the curves of the Manhattan Elevated in New York, where the third-rail current is used direct by interposing a differential grounded resistance. This method, however, is not suitable for the long sections employed on the South Side Elevated. Two track relays, one of 16 ohms resistance at one end of each block and one of 4 ohms resistance at the

other end, are used for each direction of traffic and the signal control circuit is carried through contacts on both. The accompanying drawing shows the typical circuits employed. Six cells of Westinghouse 3-S-4 storage battery are installed at alternate signal locations and feed the track circuits in both directions. They also supply current for the signal control circuits. Thus on the typical circuit plan the one storage battery supplies both track circuits between signals *S* and *T*, the control circuits for south bound signal *W* at the battery, south bound signal *S* and north bound signal *T*, both in rear. The control for signal *S* is from battery at *V* and *W* through wire 1, contact on 16-ohm track relay *M*, wire 2, contact on 4-ohm track relay *N* at opposite end of block, wire 3 to common ground rail *X*. The resistances *B* between the rail *Y* and the track relays are inserted to prevent the track relays from picking up under the influence of small currents leaking across between rails when short circuited by a train in the block and are adjusted to meet local track conditions.

No provision has been made for cutting out the signals governing movements opposing the prevailing direction of traffic. When trains are running south in the evening, for example, the north bound signals operate as well as the south bound signals.

At crossovers the signal-control circuits are cut through circuit controllers on the three-lever interlocked ground switch stand used to throw both switches of the crossover. Throwing the first lever sets the south bound signal to stop, throwing the second lever sets the north bound signal and both levers must be thrown before the third or switch lever can be moved.

The track relays are of the signal company's enclosed interlocking type with the interlocking mechanism removed, the two sets of magnet coils and contacts being mounted on one base. Continuous insulated rail joints are used in the block rail. The signals are of the standard electro-pneumatic dwarf type. In some places where the background is poor a metal disk about 15 in. in diameter painted white with a red stripe across it is used instead of a semaphore arm. The night indications are given by oil lamps behind red and green spectacles. Purple back lights are used.

No additional air mains were required when the automatic signals were put in. Electropneumatic interlocking plants had been installed at Twelfth Street, Indiana Avenue and Forty-third Street and the automatic signals were connected up direct to the mains supplying these plants from the power house at Thirty-ninth Street. A 1-in. pipe is carried north on the structure to Twelfth Street, where there is a storage and reservoir and spare motor-driven compressor for emergencies. A 2-in. main leads to the Indiana Avenue interlocking and this is reduced to a 1-in. main from there south to Forty-third Street. The pressure maintained is 85 lb., and even during the busiest hours there is no appreciable drop in pressure at the terminals due to rapid consumption and flow of air.

The signal system has been in operation for some time and has given complete satisfaction. The trains maintain safe intervals and run at maximum speed with practically no interruptions.

The Retail Merchants' Association, of Terre Haute, Ind., has abolished the refund fare system to out-of-town tradespeople which has been in operation for nearly two years. The merchants say the books were loaned and were thus unconsciously honored by the interurban companies when the agreement was that they should not be transferred.

IMPROVED STEEL CAR FOR THE NEW YORK SUBWAY

The Interborough Rapid Transit Company, of New York, is now completing the equipment of 50 steel cars for opera-

therefore a description of the later design should be of special value as embodying the results of a three years' practical study of novel equipment used under most difficult operating conditions. Several of these cars have already been put in service in New York.

The general considerations which guided the company's engineers in designing the car along the lines to be described instead of following certain features laid down in the original steel cars were four in number, as follows: The widening of the vestibule or platform doors; complete fireproofing; reduction in weight, and elimination of the "finish" used to imitate the usual wooden car.

PLATFORM DOORS

In order to reduce the time of station stops, it was thought desirable to increase the width of the platform doors, the new dimension being 50 in., as compared with 39 in. in the old cars. Thus it has been made possible for two people, and even three, to enter the car abreast and so to continue into the body of the car, as the space between the posts of the body doorway is a maximum because the usual

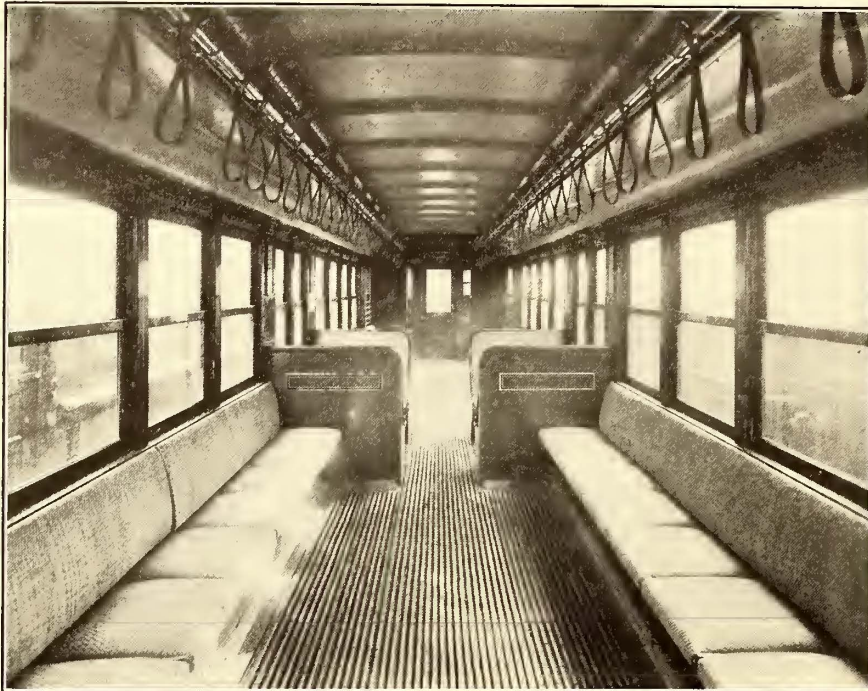


FIG. 1.—INTERIOR OF SUBWAY CAR, SHOWING SEATING ARRANGEMENT

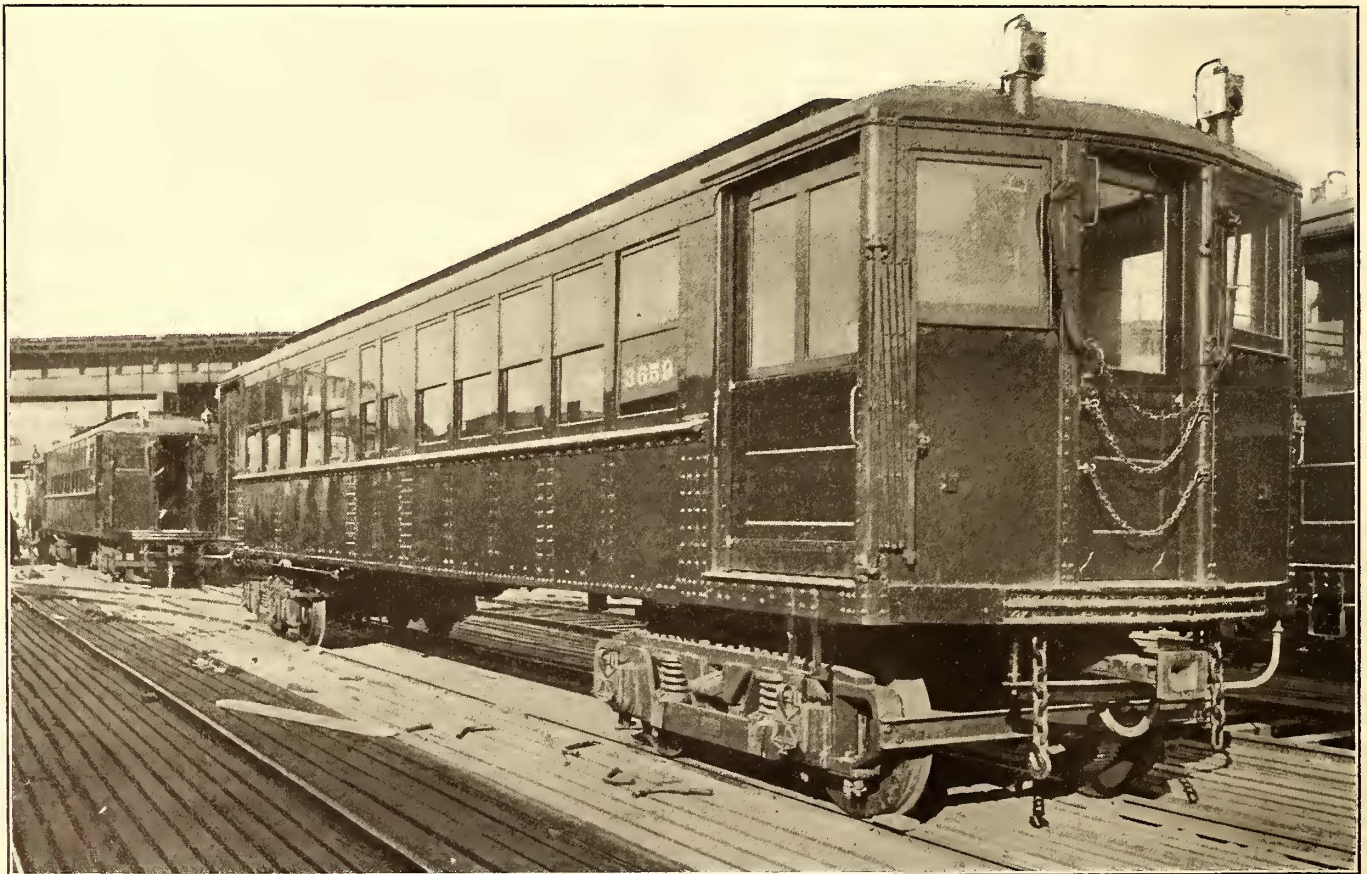


FIG. 2.—TWO OF THE NEW SUBWAY CARS READY FOR SERVICE

tion on the Subway Division. The new rolling stock differs in several interesting particulars from the pioneer cars of steel construction installed by this company in 1904,* and

bulkhead sliding doors are omitted as in the modified wooden cars.

FIREPROOFING AND REDUCTION OF WEIGHT

While the first steel cars are of fireproof construction, it

*See STREET RAILWAY JOURNAL, Oct. 8, 1904.

out equipments weighs 34,000 lb., whereas the new car weighs 32,000 lb.

SIDE AND ROOF CONSTRUCTION

An interesting feature of the car side framing is the window post construction. The window posts as shown in Figs. 6 and 7 are hollow and box shaped, and are made of

place. Instead of the usual ventilators consisting of wood sash with lights of glass, pressed steel shutters have been substituted. These shutters are operated in the same manner as the old-type ventilators. In fact, with the exception of the doors, window sash, buffers, mat strips and furring strips on the lower deck carlines, no wood has been used in the construction of these cars.

ELIMINATION OF FINISH

It was determined to eliminate all parts which heretofore were used simply as finish, in many cases covering up the structural members. There appeared to be no good reason why a steel car should be made to look like a wooden one, but, on the

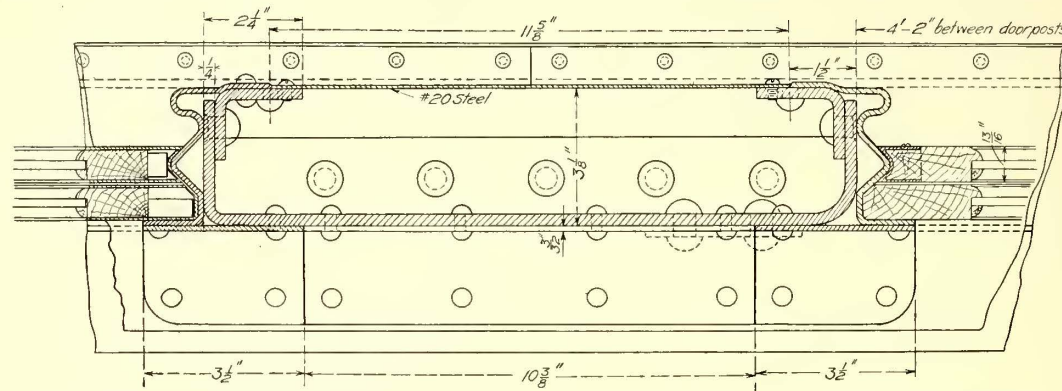


FIG. 6.—ONE OF THE TWO WIDE CENTER WINDOW POSTS, SHOWING ARRANGEMENT FOR SASH AND CURTAIN GROOVES

1/8-in. steel pressed and corrugated to form window and curtain guides, the application and removal of the sash being accomplished by means of a sliding steel shoe held in position against the sash and corresponding post corrugation by a flat steel spring. This also makes the sash self adjusting, doing away with the necessity of fitting each one to its particular frame and preventing rattling.

contrary, it should show distinctively that it is made of steel. Wherever possible, therefore, the structural members have been left exposed, notably in the posts and car body and vestibule roofs. In the clerestory the construction is of the simplest, as no headlining is used, the under surface of the sheet steel roof being painted with aluminum bronze and varnished. The carlines of light angle bars are left exposed, and as they are grouped in pairs, give more or less the effect of a "timbered" ceiling.

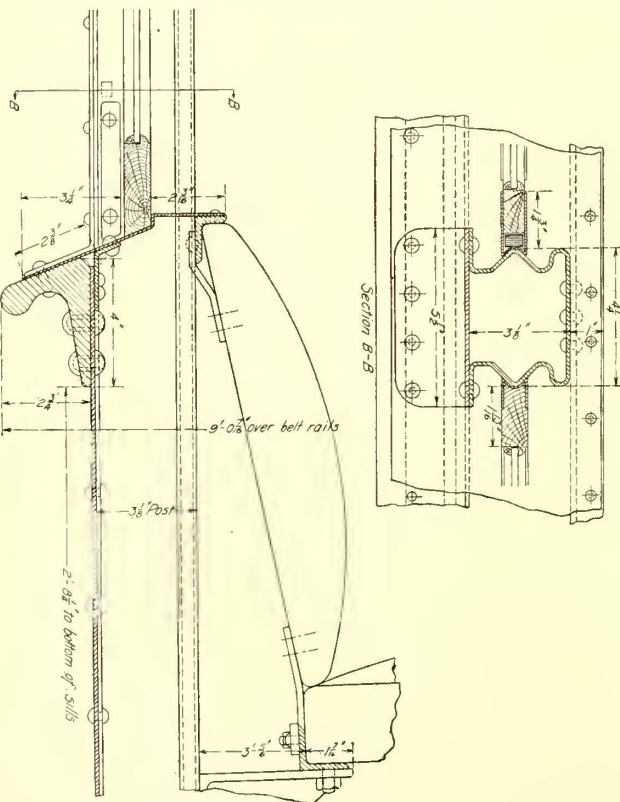


FIG. 7.—WINDOW POST DETAILS—LOWER PART

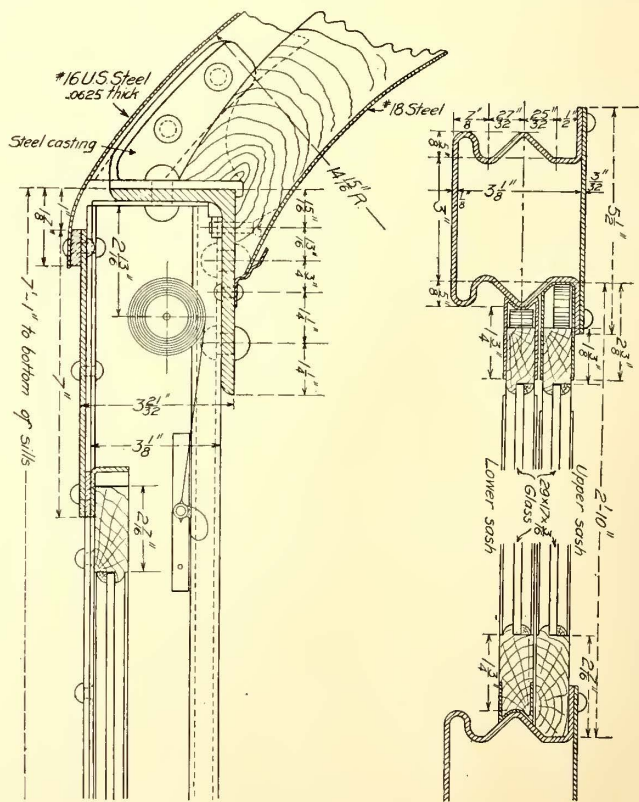


FIG. 7.—WINDOW POST DETAILS—UPPER PART

struction, particularly in the deck sill and upper deck eaves, where its place has been taken by standard angle bars with their flanges pressed to the shape desired. The roof itself is made of sheet steel 1/16 in. thick, riveted to the carlines in sections, which are lap-riveted, the sheets having been tinned near the edge and sweated together in

In order not to break up the ceiling unduly to the eye the intermediate carlines are placed on top of the roof. The necessity of providing for advertising cards made the use of headlining advisable on the lower deck and ash furring strips therefore were bolted to the carlines for its support, the headlining being fastened thereto by wood screws.

ANTI-TELESCOPING DEVICE

Two 1/4-in. steel plates at each end of the car laid flatwise are riveted to the top and bottom flanges of the floor framing. Further provision is made against the climbing and telescoping of cars by means of heavy steel castings with horizontal ribs, bolted to the face of each buffer

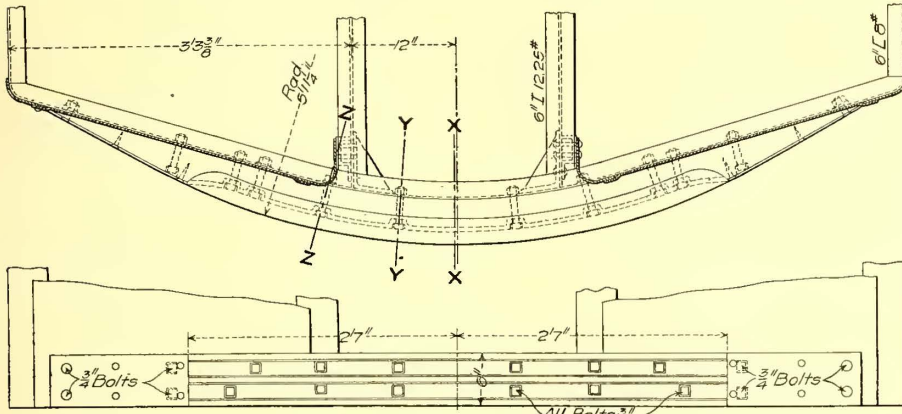


FIG. 8.—PLAN OF BUFFER AND SECTIONS OF ANTI-CLIMBER

timber, designed to interlock in the event of a collision. These "anti-climbers" are the invention of Frank Hedley, general manager of the Interborough Rapid Transit Company.

SEATS, HAND RAILS AND STRAPS

The framing of all seats is of structural steel and steel plates. The backs of the longitudinal seats are made in three lengths for each quarter section. The longitudinal seat frame angles are supported by steel plates, which form the heater panels and are stiffened by vertical angles between the heater panels. There are nine seats in each quarter

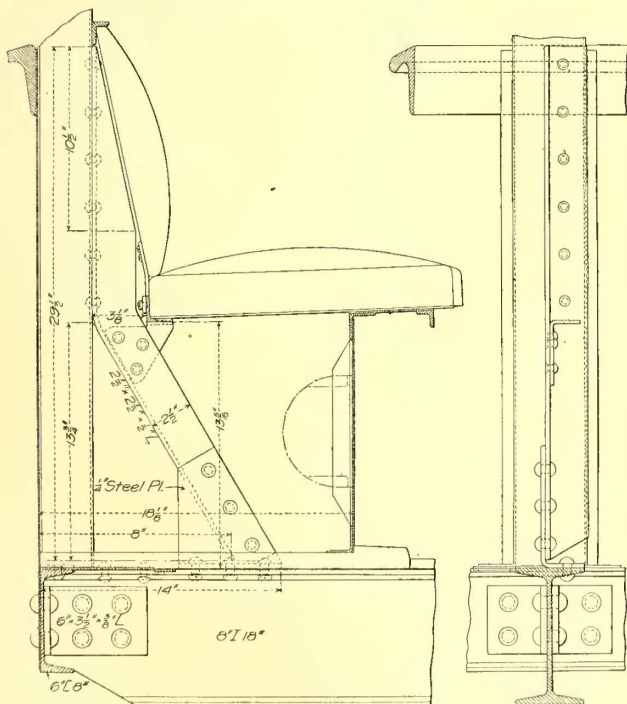


FIG. 9.—DIAGONAL BRACING BETWEEN SIDE SILL AND NEEDLE SILL

section of longitudinal seats and four center cross seats instead of eight as in the old type of cars. All the framing, cushions and backs are of steel.

An aluminum tube hand rail, 1 1/2 in. in diameter (weight, about 6 oz. per foot), extends the length of the clerestory on each side of the car, supported in aluminum sockets at

the ends and by aluminum cast brackets riveted to the deck sill. The hand rail on each side of the car carries thirty-eight straps.

WIRING

The underbody wiring of the new cars is practically the same as in the old steel car except a few minor changes to suit the new under-frame. The light conduit for the lower deck lights by using the compact outlet boxes shown in Fig. 13 is carried outside the lower deck head lining and held in place by straps each attached to carline furring strips by two wood screws. This method has cut down the installation cost very materially. The conduit for the

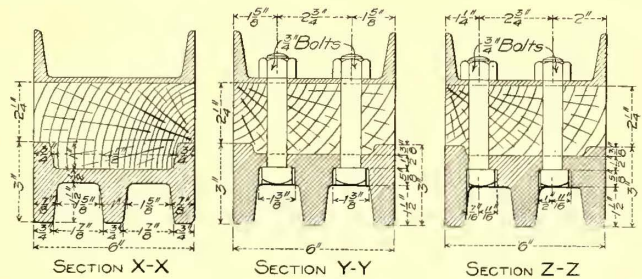
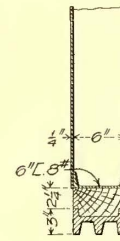


FIG. 8.

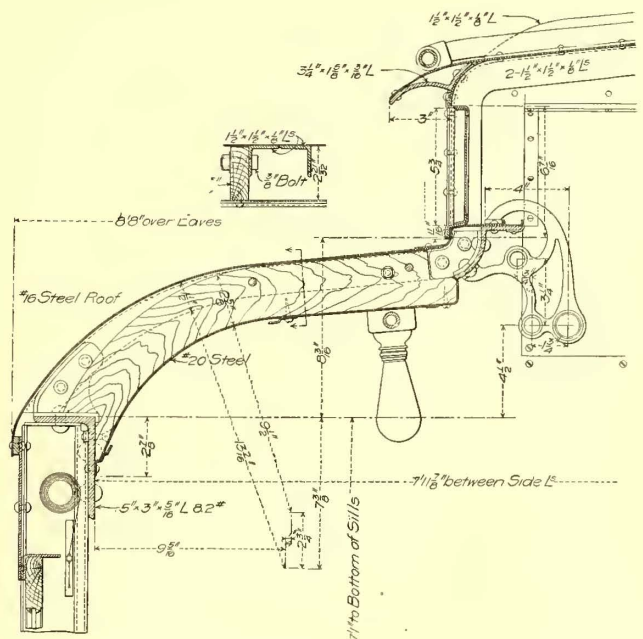


FIG. 10.—SECTION THROUGH UPPER PART OF CAR

center lights is run along the roof eaves with branches to each light, as shown in Fig. 10. There are six center lights, each located at a roof carline and held in place by a junction box screwed to a special brass fitting which passes through the roof to the conduit pipe. This fitting has a brass flange sweated to the roof.

GENERAL DIMENSIONS

The trucks are designed to be adjusted with light car to a height of 2 ft. 8 in. from the rail to top of truck center plate, making the following dimensions of body and truck:

	New Car.	Old Car.
Length over body corner posts.	39 ft. 5 in.	41 ft. 1/2 in.
Length over buffer castings...	51 ft. 1/2 in.	51 ft. 2 in.
Length over drawbars.....	51 ft. 4 in.	51 ft. 4 in.
Width over side sills.....	8 ft. 6 3/4 in.	8 ft. 6 3/4 in.

Width over eaves of lower deck	8 ft. 7 15/16 in.	8 ft. 8 in.
Width over window sills.....	9 ft. 7/16 in.	9 ft. 1/2 in.
Width over battens.....	8 ft. 7 1/8 in.	8 ft. 7 3/4 in.
Width over platform floor....	8 ft. 10 in.	
Height from underside of sill to top of plate.....	7 ft. 1 in.	7 ft. 1 in.
Height of body from underside of center sill to top of roof angles	8 ft. 9 7/8 in.	8 ft. 9 7/8 in.

The trucks are designed to be adjusted with light car to a height of 2 ft. 8 in. from the rail to top of truck center plate, making the following dimensions of body and truck:

Height from top of rail to under side of side sill at truck center (car light). (New car), 3 ft. 2 3/8 in. (Old car), 3 ft. 2 1/8 in.

Height from top of rail to top of roof not to exceed (car light)..... (New car), 12 ft. 0 in. (Old car), 12 ft. 0 in.

DESIGN AND EQUIPMENT

The design of the new car was worked out by the Interborough Rapid Transit Company's engineering department. The cars were built by the American Car & Foundry Company. The No. 212 commutating pole motors and Type M control were furnished by the General Electric Company, the A. M. R. high-speed, quick-action graduated-

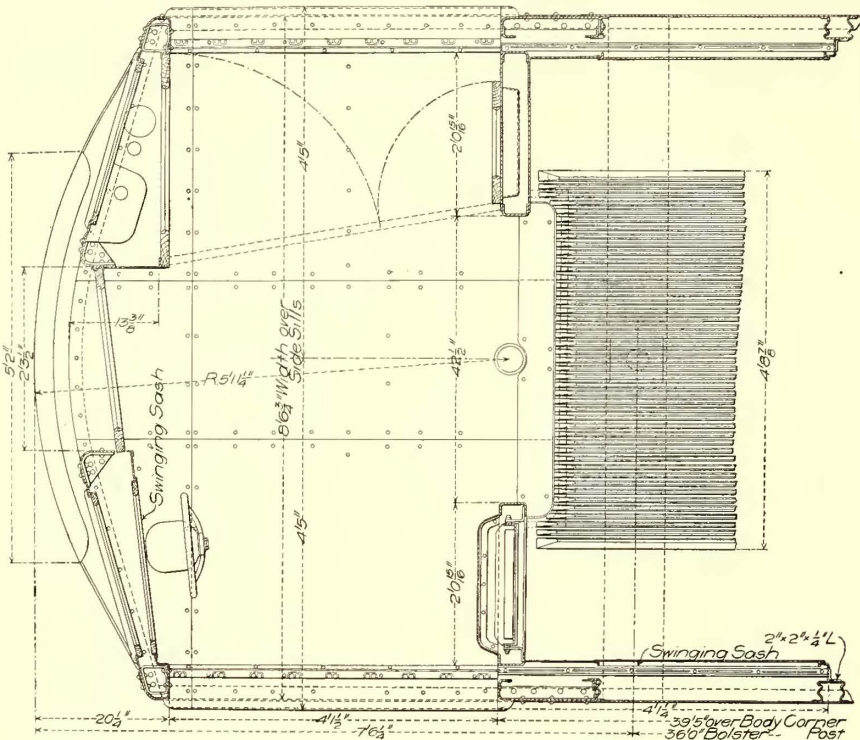


FIG. 11.—PLAN OF VESTIBULE, SHOWING BULKHEADS AT THE END OF CAR BODY

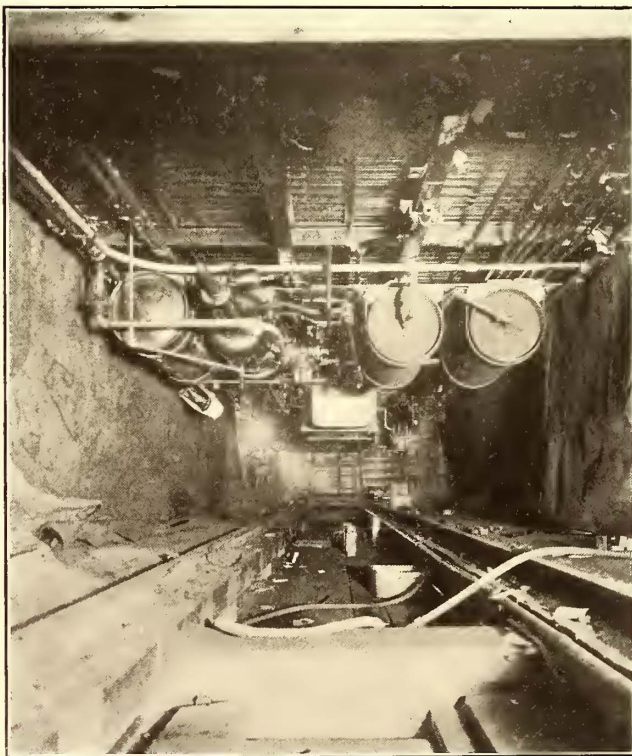


FIG. 12.—UNDERBODY VIEW, NEAR AIR RESERVOIRS

Distance between backs of side angles	7 ft. 11 7/8 in.	
Width over sheathing.....	8 ft. 6 15/16 in.	8 ft. 7 in.
Width over eaves of upper deck	5 ft. 7 1/4 in.	5 ft. 7 1/4 in.

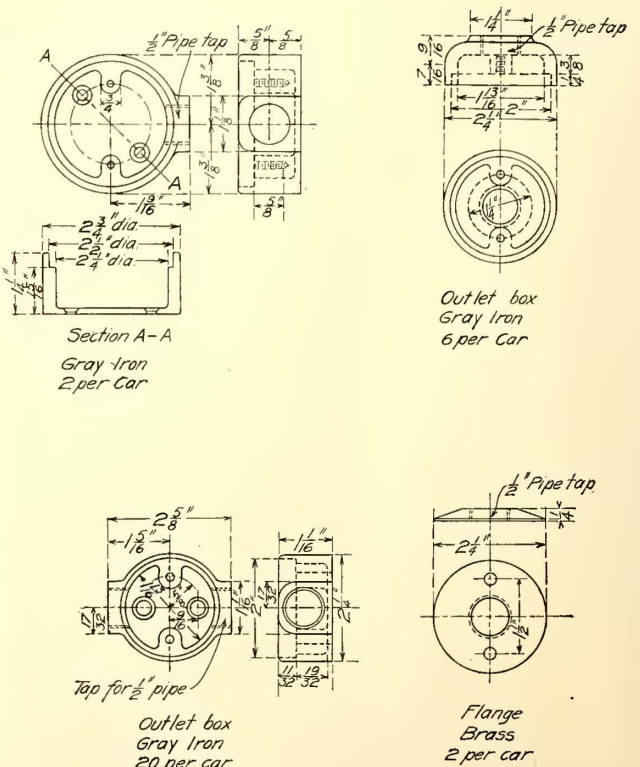


FIG. 13.—CONSTRUCTION DETAILS OF OUTLET BOXES

release air-brake system by the Westinghouse Traction Brake Company and the heaters by the Consolidated Car Heating Company.

THE SMALL COMPANY AND THE NEW CLASSIFICATION OF ACCOUNTS

BY W. B. BROCKWAY

After a development so rapid that even the brainiest and most versatile of bankers and operating men could only guess at what the future contained, during which the optimist was a better guide than the conservative, when comparisons with the records of even five years before are no comparisons at all and the changes in apparatus have been so revolutionary that practically nothing remains of fifteen years ago, the electric railway industry now faces a problem that offers another change of tremendous proportions and destroys much of the experience gained by the travail of the immediate past.

The Interstate Commerce Commission, which, under the terms of the lately made revisions of its authority has jurisdiction over a few more or less important electric lines, has been working in conjunction with most of the State Commissions which have jurisdiction over the large majority of intrastate electric roads, and together they have formulated a classification of construction and operating accounts which is so new and strange that the one part of electric railway operation which has shown a tendency to be satisfactory—the accounting—is to be revised even to the extent of its principles and in a detail that cannot at present be wholly understood because the classification has not been published long enough to be digested.

The present standard classification, which has really become standard, was adopted by the Street Railway Accountants' Association nine years ago and is so elastic that the smallest roads have thirty-nine accounts in operating expenses, which is rather more than they need, and the largest roads can so expand the subdivisions that any detail desired can be provided. The classification proposed by the Interstate Commerce Commission provides for the two extremes, the largest and the smallest companies. The largest (not over a dozen companies) will hardly have accounts enough and the smallest are provided for about right, while the medium-sized roads, which are the owners of by far the greatest part of the mileage of the country, will have from three to six times as many accounts as they need or can use with any degree of accuracy or satisfaction.

The only excuse which is offered for this change is that because electric railways carry passengers (nearly all within the boundaries of cities and towns) their accounts should be similar in form to those of steam railroads, which also carry passengers, and that because the steam railroads are older and of greater extent than the electric railways the classification of the former should be followed in principle by the latter, although the services performed by each of these public utilities are entirely different. An analysis will quickly show, however, that any plan based upon this line of reasoning is fallacious and would compel a medium-sized electric road to employ a classification of 116 accounts for which it has no more use than a village would have for an elevated passenger railway.

In its letter of transmissal the commission declares that it has prepared an abbreviated classification for use by the "smaller companies," or those with gross earnings below \$50,000 a year, and that as soon as a company exceeds this income it must add ninety-four accounts. As this change is of tremendous import to the small company, it seems

eminently desirable to consider the following questions: "What is a small company and when does it become a large one?"

A careful study of electric railway operation will show that while the gross earnings are probably the easiest means of fixing the point where a small company becomes a larger company, the real underlying difference is not in the size of the receipts, but in the character of the organization required to conduct the affairs of the company. Any electric railway company is small, no matter what its earnings, when a few men only are needed to perform its functions. It is only when more men are added to the force to do the work previously done by one man that the growth commences to be defined. It is only then that the company begins to require—or is even able to supply—more detail in its accounts or other matters.

A critical examination of the conditions also clearly indicates that the quantity and, mark this, the quality, of the data, which any company can embody in its reports, and the degree to which its statements are an exact reflection of its condition, depend primarily upon the *men who operate the road, not the men who administer it*. The reason for this will be readily understood. No man can give accurately much detailed information, even about his own work, when his training has not been such as to permit him readily to recognize and appreciate the refinements of a detailed classification. Again, and this is a matter of still greater importance to the public and to the company, the operating manager of any electric railway corporation must recognize that his first duty is to keep his cars in regular operation, so that the public shall be transported when and as the agreements made by the company in its franchise require. In the execution of this paramount obligation upon an electric railway company there are times, and these times occur frequently, when no one, not even the office force of a small company, can stop to make records of material consumed nor maintain fine differences in the classification of labor in the conduct of the work. Everything else must give way while the efforts of the entire force are devoted to maintaining an uninterrupted car service. No one who has been actively connected with a small electric railway company, and the writer claims to have had that experience, will dispute for a moment the reality of the conditions just depicted. It is a fundamental economic fact that simplicity in all matters of administration, accounts included, must be the rule with the small electric railway company. This condition being acknowledged, it is only necessary to fix the point where more detail can be secured of the results of operation.

One of the greatest problems in any classification of accounts is undoubtedly that of obtaining accuracy in charges which require any amount of estimation or apportionment. This is particularly difficult on a small road with most of the expenses which are included in the departments of maintenance and transportation. The training and education possessed by the average foreman in either of these departments have usually been along entirely different lines, and it frequently happens that the more efficient he is in the conduct of his own work the less fitted he is accurately to estimate and separate the various charges which go to make up a part or all of his expenditures. If, then, the information which he furnishes of the expenditures in his department has to be separated among a large number of accounts by guess work, either by him or others, an amount of inaccuracy will be introduced which will de-

stroy all value of the classified expenses so far as they relate to the apportioned accounts.

Thus it is that the law of simplicity must continue as long as the organization remains simple. Complexities can be added only when the number of men and their experience with records reach a point where the details may be provided without affecting the service and the element of apportionment ceases to be a large factor.

The organization of a small company does not change materially as the earnings increase except by the addition of car men and the lower-priced office, shop and track men. The duties of the superintendent, bookkeeper and foremen keep on the same broad general ground as before. Assistance to relieve them in their work is usually provided first in those places where the least experience is required to help out with the mechanical part of the work, not with the recording of it. It is only at the point where the head of a department—that is, the bookkeeper or the barn, track or other foreman—has his particular duty divided up, either by the employment of other foremen, so as to take charge of certain parts of the work formerly done by the one foreman, or, in the case of the bookkeeper, if his duties are split up by the employment of a chief clerk or other important assistant, that it is possible for a company to expand its system so as to provide more detail in any department. It is at this point, therefore, entirely apart from the gross earnings of the company, that an increase in the number of operating expense accounts can be made without serious injury to the quality of information furnished to the office by the foremen and other departments and the accounts can be kept by the office in a comprehensive and detailed manner.

Practical experience with the accounts of electric railways leads the writer to state positively that there will be absolutely no alteration in the organization of an electric railway having gross receipts of less than \$50,000 per annum, when the earnings increase so as to equal that amount. In fact, there will be no real change until the receipts have reached several times that sum. In order that it may be clearly understood what the office and other organization of an electric railway usually is when the company is small, it seems proper to set forth briefly the customary duties of the different officials and foremen.

Beginning with the president, he will usually be found to be a banker or prominent business man of the locality in which the railroad is situated, who has invested a greater or less sum in the company and has been selected to be the president either because of his prominent connection in the town or because of the confidence the public and the other stockholders have in his integrity. It is rarely that he has a controlling interest in the company, and it is far more rare when his duties as president extend far into the actual operation of the company. In other words, his duties are placed upon him purely as a side issue which he can attend to without interrupting his usual occupation. He has no clerical or other assistants connected with the company as such, and his salary is purely nominal if he has any at all.

The vice-president is in exactly the same position as the president, and he also has practically no connection with the actual operation of the company.

The duties of secretary and treasurer are usually combined in one person, and nearly always he is also a prominent citizen—a lawyer or bank cashier—whose duties consist entirely of keeping the minutes of the company and signing such checks as the bookkeeper brings to him. If he has any salary at all it is considerably less than \$1,000 a year.

The general manager (or more often his title is superintendent) is the man who runs the road. He almost always personally superintends every movement and everything of any importance connected with the company. His duties are so comprehensive that he makes the schedules, oversees the repairs to the track, does all the hiring, disciplining and discharging of the men, directs in the most minute detail the care and repairs to the equipment, settles the claims made against the company, helps to replace cars upon the track, appears before the Board of Aldermen or other governing body, and briefly does so much that it is practically impossible comprehensively to list his versatility. His salary runs from \$100 a month upward, but rarely gets above \$4,000 a year up to the first half-million dollars gross income and sometimes beyond this amount. His only office assistant consists ordinarily of a stenographer, in whose person is also combined the duties of stenographer for all other officers connected with the road. When not so engaged, this assistant performs clerical duties in the office.

The bookkeeper is also cashier and paymaster. He it is who goes to the barn in the morning and gets the money deposited by the conductors, brings it to the office and counts it and takes it to the bank. He is the office representative of the company and as such he does everything pertaining to the work of such an office. He makes the payroll from the simplest of records turned in by the foreman and he pays the men. He keeps all the books, draws all the vouchers and checks and attends to all the office duties not taken care of by the superintendent. His only assistant consists of the joint stenographer mentioned above and perhaps one other assistant who is paid \$30 or \$40 a month.

Neither the superintendent nor the bookkeeper can be said to have definite office hours. They are subject to call at all times and they are so called.

Other than the above there will usually be found a barn foreman with all that that implies in the dispatching and housing of cars and the cleaning of them. He also has the immediate charge of repairs to equipment of every nature; he is subject to call and is called to participate in replacing cars upon the track or in any other way wherever it may be that he, through his personality or experience, may be useful to the superintendent. It should be clearly kept in mind that this man, with a salary of perhaps \$75 a month, rarely much above this amount, has no clerical assistants whatever, and he personally keeps the time book, reports the consumption of material and makes whatever few simple reports are necessary that the superintendent or the bookkeeper may have the proper records for their office.

There will also be a track foreman who is also the chief lineman with no clerical assistants whatever, except perhaps a child in school who assists him evenings, and the child probably has more education known as "book learning" than the father. If there is a chief engineer in the power house (although his duties are frequently combined with those of the barn foreman or the superintendent of the road), he has no clerical assistants and upon him devolves the duties of making such reports of wages and other matters as is required. His salary will approximate \$75 a month.

There is an office, of course, which as an echo from the larger company, is usually called the general office. Everything connected with it has immediate contact with the whole road and all of the organization. As pointed out above, there are practically no set of office hours, and

everyone connected with the company has as his particular duties anything his time or capacity will permit him to do.

The above is a brief statement of the organization of the average small company whose annual gross earnings are \$250,000 or less. The use of many words will not make it clearer that when the gross earnings of a company of the kind described pass the point dividing \$49,000 from \$50,000, no changes of any kind will be necessary in the organization. In fact the same organization will go on until several multiples of \$50,000 are reached, and then the only modifications made will be those outlined above. It is evident then that the needs of this company do not require more detail in the operating accounts by the mere change of \$1,000 in the gross earnings, and it is just as clear that an increase of some 94 accounts to show the operating expenses means the most confused estimations in order to divide the labor and material consumed and other charges into 116 accounts.

With a small company the track man is a track man and perhaps lineman combined. His time is divided in any way the emergencies require, whether it be work upon the track, overhead line, the power house or with derailed cars. The work of each man in the shop is so comprehensive that from experience connected with such matters it seems impossible with the help at hand to make a separation of the labor or material costs into the fine distinctions required by the large classification. This same complexity of duties permeates every branch of the service and will require estimations and approximations innumerable. None of these men has the time and practically none of them has the capacity of appreciating the fine distinctions of this larger classification. Lack of time alone will require employment of clerical help which at its best is untrained and quite unfamiliar with the requirements of the theories of accounting. The result cannot fail but be not only unsatisfactory but absolutely inaccurate if the change from the small to the large classification is made by the addition of \$1,000 to the gross income of the company. It is also quite reasonable to expect that the employment of the large classification will entail more expense for clerical hire than the increased gross earnings bring in—a condition which surely is not just to the company when no benefit accrues to it or the public which requires it.

It must be understood that the writer has no desire to handicap in any way the adoption of a standard classification. But by pointing out in such detail the conditions under which the small company is operated, he hopes to show that a change of a few thousand dollars in gross earnings will not change the organization, and that it is the organization that makes the records and keeps the accounts of the company. A better plan than that suggested would be to have three and not two classifications of accounts. One could consist of the suggested twenty-two accounts and should apply to all companies whose gross earnings are below \$250,000 a year; a second classification consisting of say fifty accounts could be used by those companies whose gross earnings are between \$250,000 and \$1,000,000 a year, and the third and largest classification might be adopted by all those companies whose gross earnings are above \$1,000,000 a year. By this means the number of accounts between the first and second classification are a little more than doubled when the needs of the company and the public, in the information required about the company, have grown to such a point that the detail can be given with a small amount of approximation. Then as the company grows to the end of the second stage, the number of accounts are

again a little more than doubled at the point where its needs and the needs of the public can again be provided with a small amount of approximation.

This plan is not only possible but logical, because a company needs more information and more organization as it grows, but it is clearly illogical that when a company passes the \$50,000 point it should then be required to furnish as much detailed information as a company having a gross income of \$12,000,000 or more a year. Some plan should be adopted which will recognize the distinction in size that can be clearly defined as small, medium and large.

The reason for fixing the point at which the smallest classification changes to the proposed second classification at \$250,000 per annum is because it is only at about that point that the organization changes sufficiently so that the needs of the company are greater. This limit, of course, is five times the amount suggested by the Commission, but the writer is inclined to the view that the Commission suggested \$50,000 gross income merely as a tentative figure and that the matter is not closed. It is sincerely to be hoped that the Commission will recognize the amount is far too small.

The point of change between the second and third classifications, as suggested by this article at \$1,000,000 is based upon the organization usually maintained by a company of this size, and the number of accounts recommended is all that such an organization could assimilate or have need for.

Some of the companies in the class above \$1,000,000 will find it difficult to get along with even the 116 accounts required by the proposed large classification, although there are probably not over a dozen companies so situated. On the other hand, the majority of the companies with these receipts would, under the large classification, be furnishing more information than is required for operative or financial purposes.

From the standpoint of the public, in whose name and for whose use the new classifications are proposed, it would seem necessary that any information required by a standard classification of accounts should not be such that accurate information is impossible to obtain, and as such useless to whatever needs the result of compilation may be put. Theoretically the proposed classification has points which are attractive to the student, but useless if inaccurate and confusing in operation. Therefore, those who are to utilize the information obtained by this classification should carefully weigh the processes which a company has to follow to answer the requirements of the classification. The small electric railroad bears very much the same relation to the large metropolitan system that a drygoods store in a small community would have in comparison with the department store in a large city. It is a local matter with local stockholders, just as everything connected with the business life of the small city is local. No business man who should happen to own a store in a small town and another of the same kind but of ten or twenty times the size in a larger town would think for economic reasons of requiring both to follow exactly the same system of accounting or in other parts of the business routine. The practice of each would be suited to its needs, and it seems as though the same consideration should be given the electric railway.

The fact that a small electric railway is in the business of transporting passengers, like the large electric railway, is hardly a sufficient reason for placing them in the same class, so far as all or any part of their methods is concerned. One organization is small and simple, the other is

large and complex, so that were it not for other reasons, it would seem that the population served might govern in the change of classification from one number of accounts to another, but the writer does not believe this is practicable and does not make it as a suggestion, except as a means of pointing out the different requirements of the different sized companies.

It would seem that the Interstate Commerce Commission and the Railroad Commissions of the different States are going to have difficulty in impressing upon the organizations of the small or medium companies the importance of following carefully the classification as now drawn. Few if any of them will understand the references and two-paged explanation of 12 cents per diem charges for the rental of cars, and the class of equipment referred to as stock, tank, gun truck and water revenue cars will be an unheard of class of equipment. Again, the other distinction of the classification providing for joint facilities will be a sealed book and a means of utter confusion in the minds of the bookkeepers of those companies who draw an annual salary of perhaps \$900. These and other requirements of the classification, such as the providing for a censor of telegraph and for the cost of maintenance and operation of water stations along the line, would seem to indicate that a street railroad is not a street railroad any more, but that all electric railway practice must be revised to make it conform to that of steam railroads in operation as well as in accounting.

In conclusion, it is important that the electric railways of the United States should carefully scrutinize the proposed classification and reply to the circular of the Commission in a frank and sincere manner. After digesting these replies the writer hopes and believes that the Commission will recognize that a large classification will not do for all companies over \$50,000, nor will two classifications, which are the extremes in detail, satisfy the needs of the public or the companies themselves, but that something more is needed which will move along the lines of least resistance. This, it is suggested, should consist of three classifications which grow as the companies grow.

CHEMISTRY AS IT IS RELATED TO STREET RAILWAY WORK

An interesting address on this subject was presented Feb. 27 by Prof. William H. Walker, professor of industrial chemistry at the Massachusetts Institute of Technology, before the New England Street Railway Club. Prof. Walker said in part:

"The relation of chemistry to any of our great industries may be considered from two points of view: First, chemistry broadly applied as a science with a view to determining the fundamental underlying principles of a given phenomenon, in order that such phenomenon may be intelligently and therefore successfully dealt with; second, chemistry considered more particularly as a tool and used to determine the composition of a material, and therefore its quality and general adaptation for a particular class of work. It may be contended that street railways do not employ chemicals nor do they carry on chemical processes. But when we consider that all materials with which we have to do in life are chemical elements or compounds, susceptible of undergoing chemical reactions, and that all processes in which the substance considered changes its state are essentially chemical processes, the relation of chemistry to railroad work is apparent.

"Wood as a material may be considered as made up of small individual fibers called cellulose, an encrusting or cementing material known as lignin and certain sugars and albumens dissolved in the sap. Decay in wood is the result of the growth upon it of micro-organisms known as molds or fungi. These organisms grow most readily in the soluble material of the sap; therefore when wood is seasoned and this nutrient material of the sap rendered insoluble, decay in wood is greatly retarded. Treating the wood with proper germicidal solutions will also prevent this fungus growth and therefore preserve the wood. Hence the use of bichloride of mercury in Kyanizing; strong zinc chloride in Burnetizing, and carbolic acid in Creosoting.

"Iron is a material the scientific investigation of which, from a chemical point of view, has led to marvelous advances in engineering construction. The influence of the various constituents constantly found alloyed with iron upon its properties is now fully understood, therefore specifications may be intelligently drafted so that the material best adapted for a specific use may be demanded and obtained. Recent investigations have shown that the rusting of iron is purely an electrochemical phenomenon and depends upon the difference of potential on any two points upon the surface of the iron and the resistance of the external circuit. By employing the modern theories of solution and electromotive force, the old methods of preventing the corrosion and pitting of iron may be understood and new methods suggested. Other alloys, such as bearing metals, bronzes for trolley wheels, etc., have been investigated microchemically, so that the engineer need no longer be in ignorance of the functions of the various constituents of which alloys are composed.

"The chemical processes taking place in the drying of linseed oil and the relation between various commercial pigments as found in paints to the physical characteristics of the resultant film, are now quite well understood, and it is possible to obtain a paint the cost of which is commensurate with the value of the material to be covered.

"The fundamental principles of chemistry which underlie the combustion of fuel and the generation of steam have been so thoroughly worked out that the engineer need no longer be swindled by magic boiler compounds and scale preventions, nor imposed upon by the unscrupulous coal dealer.

"From the more purely analytical side, chemistry may be easily seen to be indispensable to the intelligent manager and the careful purchasing agent. In every case, whether it be creosote for preserving ties and poles or steel for rail- and structures, or oil or coal or what ever it be, only that material should be specified and bought which will most efficiently and economically do the work; and only that material should be accepted and used that fully answers to the specifications submitted."

During the Lewis & Clark Exposition, held in Portland in 1905, the peak of travel on the lines of the Portland Railway, Light & Power Company was reached. As evidence of the phenomenal growth of Portland and suburbs, it is interesting to note that street railway travel for the year 1907, two years after the exposition, shows an increase over that in 1905 of 9.6 per cent. The travel for 1907 as compared with 1906 shows an increase of 18 per cent, and during the same period new equipment was added to the lines to the extent of 33 1-3 per cent. Portland now is the largest city on the Pacific Coast north of San Francisco.

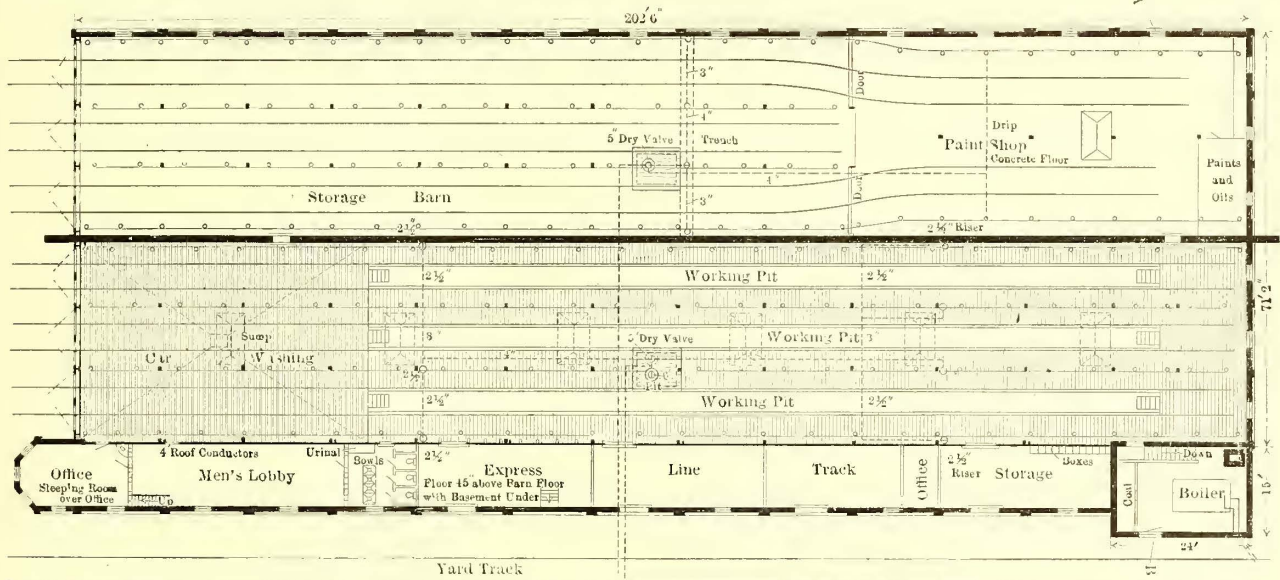
CAR HOUSE OF THE BOSTON & WORCESTER STREET RAILWAY AT FRAMINGHAM, MASS.

The Boston & Worcester Street Railway Company has recently completed at Framingham, Mass., a new car house which embodies several up-to-date features in connection with the many requirements for the quick handling and storage of cars, a fire-protection system based upon the exacting requirements of the Board of Fire Underwriters of New England and a successful heating system. The building also represents the latest ideas of a low "first-cost-mill" type of construction, as applied to car barns, in which the usual steel trusses have been entirely omitted. It is about 206 ft. long x 86 ft. wide with low roof (about 18 ft. above the floor) divided as shown in the plans into two principal sections by a concrete fire wall 20 in. thick which extends for a distance of 5 ft. both in the front and in the rear of the building and also 5 ft. above the highest line of the roof. The outside walls of the building are brick, 12 in. thick, reinforced with pilasters spaced 15 ft. on centers. All foundations are concrete. In addition to

is concrete about 4 ft. 6 in. below the main floor and pitched in several directions to drain.

The roof is of 2½-in. tongued and grooved pine plank spiked directly to the hard pine roof rafters supported by hard pine posts 15 ft. on centers. The roofing material covering the whole is five-ply tar and gravel. Particular attention has been given to the lighting of the building. Extra high mill type windows are located at frequent intervals in the side walls, and skylights with galvanized iron frames and wire glass lights occur at frequent intervals in the roof in the working portion of the barn. The main doors are framed of wood in a substantial manner and are hung direct to steel columns with extra heavy strap hinges, the wall over the doors being supported by steel lintels resting on these columns. This method of construction is very rigid and prevents any sagging of the heavy doors.

The working part of the building, including the annex, is heated from a boiler in a fireproof boiler room in the rear and a part of the annex set at such a depth below the barn floor that a gravity return heating system is possible. The boiler is of well-known cast-iron sectional type operated at low steam pressure, under which condition a



PLAN OF CAR HOUSE AT FRAMINGHAM

the storage capacity of the barn provision has been made in the annex for a foreman's office, men's lobby and a lavatory and express, track, line and storage rooms.

As the barn is located several miles from the other barns of the company it is to be operated as a unit plant for this section of the road and has to answer to a variety of requirements. One of the main sections of the barn is designed to be used for car washing, inspection and overhauling of the cars and trucks; while the other is intended for storage, with the exception of the rear portion, which is to be used as a paint shop. The working portion of the barn has the usual pits, etc., the floor area between them being planked with 2-in. stock resting directly on the 8-in. x 10-in. hard pine track sticks, which are supported on brick piers, 12 in. x 16 in., with the exception of the floor of the wash room, which is similarly constructed only the planks are all laid with a ½-in. space between. Under the whole is a concrete basin pitched to a "sump hole," which is connected with the main sewer drain which carries off the water from the roof and that which is used in washing the cars. The area under the working portion of the barn is a continued pit from wall to wall, the floor of which

licensed fireman is not required. The heating is done by a system of coils hung horizontally between the open pits for the whole length of the working portion, which overcomes the troubles experienced when located vertically at the side of the pit. Vertical coils are used in the paint shop and offices.

The general scheme of fire protection as planned and as installed was to provide a complete system of overhead and so-called aisle line sprinklers, both systems being in strict conformity with the requirements of the National Board of Fire Underwriters as recommended by the National Fire Protection Association and the American Street & Interurban Railway Association. In addition to the sprinkler equipment approved 3-gal. chemical extinguishers and sand and water pails were provided for internal protection. The external protection consists of outside hydrants housed and having hose attached. In addition a fire-alarm box is to be provided by which the town fire department, located about ¼ mile distant, can be summoned.

The water for one of the supplies to the sprinklers and to supply the hydrants is provided by means of an 8-in. pipe connected with the 8-in. street main on Eastern Ave-

nue. The 8-in. yard pipe is brought to a point about 40 ft. from and opposite the middle of the east side of the building. Here is located a check valve and three post indicator gate valves to control the town supply of water for the sprinkler equipment and also to control each supply of water to the two sections of the car house, these being independent and supplied through 6-in. pipes. Two 6-in. pipes are carried from this point to the rear of the lot, one connecting with the gravity tank and other supplying a hydrant. The gravity tank has a capacity of 20,000 gal. and is on a trestle at such a height that the bottom of the tank is 50 ft. above the highest line of sprinklers, the tank being arranged to feed the sprinklers only. In addition to the hydrant located at the southeast corner of the building an additional hydrant is located at the northwest corner supplied by a separate 6-in. pipe from the 8-in. street main. All underground piping is cast-iron, tarcoated, water pipe, N. E. Waterworks' Association Standard, and was laid by the Framingham Water Company.

As the house was not sufficiently heated to warrant installing a wet-pipe system, a dry-pipe system was used, the valves being located in pits about the middle of each section. In the east section two dry-pipe valves are provided, one supplying the overhead and the other the aisle line sprinklers. In the west or storage section one dry-pipe valve is used, but the overhead and aisle lines are controlled by separate valves just above the dry-pipe valves. The overhead sprinklers are spaced about 12 ft. center to center in 7-ft. 8-in. bays, each bay having two lines of sprinklers. The aisle lines are placed in the center of aisles between tracks and in the aisles between the outside wall and the track, and the division walls and the track. Spacing of aisle line sprinklers is not over 8 ft. center to center, staggered spacing being provided. The maximum height above the top of the rail for the aisle line sprinklers does not exceed 8 ft. 9 in. and is not less than 8 ft. 5 in. The sprinklers are so arranged as to play into the windows of the closed cars. The overhead and aisle line sprinklers are so piped that they can be almost entirely drained at the dry valves. Both electric and water rotary gongs are provided for each dry valve, the electric circuit being tested by means of a test clock in the office.

The hydrants are of the Corey pattern, two-way, and have outside gate valves. They are housed and are each equipped with 250 ft. of $2\frac{5}{8}$ -in. National Standard rubber-lined hose, two play pipes, spanner, hydrant wrenches, axes, bars, etc.

The car house will have attendants at all times. At night a watchman records hourly rounds on an Eco-magneto watch clock. During the day there are from three to five men always in attendance. As a number of the employees of the company live near the car house at no time should there be any lack of men to handle the apparatus.

The building was designed and built under the direction of E. H. Kitfield, of Boston, consulting engineer of the company, who has the designing of all the power houses and buildings of the company. J. J. Prindiville, of Framingham, was the contractor. The sprinkling and heating systems were installed by the Lumsden Van Stone Company, of Boston.

The Employees Benevolent Association of the North Jersey branch of the Public Service Corporation held its annual entertainment and ball at Kreuger's Auditorium, Newark, recently. Among those in attendance were R. E. Danforth, general manager of the railway department of the company, and Newton W. Bolen, superintendent of transportation.

CORRESPONDENCE

TURBINE ECONOMICS

SCHENECTADY, N. Y., March 5, 1908.

EDITORS STREET RAILWAY JOURNAL:

In an article in your issue of Feb. 29, J. R. Bibbins has criticised my letter in your issue of Jan. 4 and again reversed the order of merit in comparing tests of Curtis and Parsons turbines. On further investigating the matter I find that I made a mistake in transcribing the test curve of the Parsons turbine in the Manhattan station and I have corrected this error in the accompanying curve sheets. This error arose from the fact that the load on the curve

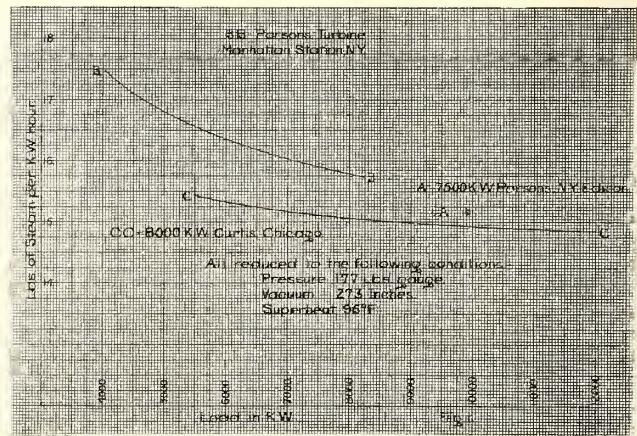


FIG. 1.

A. New York Edison test.
 BB. Test of Parsons turbine in Manhattan station corrected for pressure, vacuum and superheat to New York Edison test conditions by rates used in the report of New York Edison test.
 CC. Curtis turbine in Chicago under same conditions.

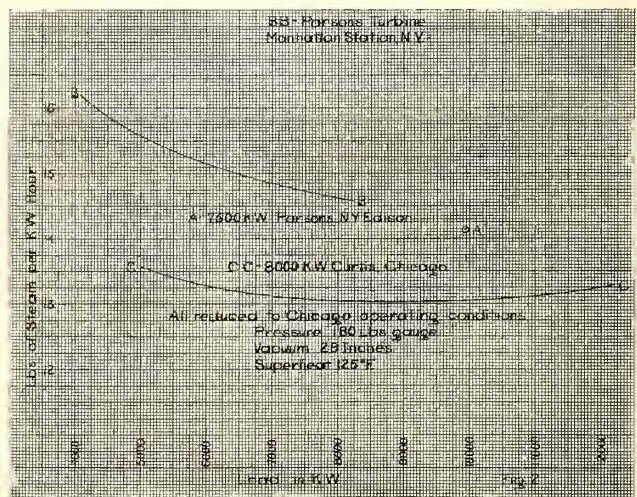


FIG. 2.

A. New York Edison test reduced to Chicago operating conditions by rates used in report of N. Y. Edison test.
 BB. Test of Manhattan Parsons turbine reduced to same conditions by same rates.
 CC. Curtis turbine in Chicago under same conditions.

given in the *Electric Journal* was stated in percent of full load and that I was mistaken in the full load rating, so that my transcribed curves were put in the wrong positions on the sheets.

Mr. Bibbins now gives curves showing far better results than my corrected curves, but these certainly have no relation to the Manhattan test which my curve is intended to illustrate. Mr. Bibbins also gives as correct curves showing results greatly inferior to those shown by my curves, but his evidences and reasoning are insufficient. Load flow lines in turbines are not necessarily straight and vacuum, superheat and pressure variations are not necessarily in accordance with theory.

My curves for the Chicago Curtis turbines are derived from the tests previously published, by correction factors taken from superheat, pressure and vacuum curves made by Professors Bull and Breckenridge. Their tests comprise more than twenty runs in addition to the runs reported in my paper presented before the National Electric Light Association last year at its Washington convention. Their rates of correction derived from these separate tests may be somewhat in error, but several of these tests were under conditions nearly corresponding to points on my curves and none of them when corrected indicates a result more than one-quarter of a pound different from those which I show. The correctness of my curves is also borne out by several tests on smaller machines which show results nearly as good.

W. L. R. EMMET,
Engineer Lighting Dept.

BOSTON TRANSIT COMMISSION REPORTS

The twelfth and thirteenth annual reports of the Boston Transit Commission have been published in a single volume, which was made public a few days ago. As usual, the reports devote a great deal of space to the construction progress of the various subway projects under way or consideration in the city. This progress need not be reviewed here, as the steps of the work have been recorded from time to time in our columns, and the lateness of the report's appearance does not justify detailed reference to the earlier construction. In some features, however, the matter included in the report is of particular interest, especially the methods planned for the ventilation of the Washington Street tunnel.

As in the original Tremont Street subway and in the East Boston tunnel, fresh air is to be admitted at the stations and portals and withdrawn from the tunnel at points about midway between. It is not in general practicable to discharge the vitiated air directly into the outer air at the points where the vitiated air is taken from the tunnel, nor is it feasible to discharge through grated areas in the sidewalks, the latter during the day being densely crowded. Air admitted at the portals and in the station entrances and leaving the tunnel at intermediate points will pass thence through specially constructed ducts, in some places underneath and in others above the tunnel, having a maximum cross sectional area of about 40 sq. ft. and a length of from 270 ft. to 430 ft., to fan chambers. There will be room in each chamber for two single-inlet centrifugal fans, each with a capacity of 20,000 cu. ft. per minute, giving an average velocity of about 1 ft. per second, equivalent to changing the air in each section three or more times per hour. Provision is to be made for the discharge of air at the following stations: La Grange Street, Hayward Place, Old South Meeting House and Adams Square.

As in previous years, the construction work has been carried on with the minimum inconvenience to the public. In the busiest part of Washington Street occupation of the surface for actual excavation has been practically limited to nights and Sundays. The disturbance of the street surface in business hours has been restricted to small openings near the curbs, 100 ft. apart, for the placing of concrete and passing building and bracing materials in and out of the trenches. The running of street cars in the day was not interfered with unless in some especial emergency, and then for a short time only. During the night and Sundays the contractors were allowed to use as much of the street surface as necessary, leaving sufficient room for

fire engines and pedestrians. Street cars have in the night frequently been diverted to neighboring streets.

The tunnel in some cases passes under buildings, and during its construction it became necessary to occupy the portion of the basements within the line of the tunnel together with a working space of about 5 ft. on each side. Underpinning of the buildings was necessary in other cases. In order to do this work there has frequently been an occupation of the basements of buildings of a space about 5 ft. in width parallel to the front walls or piers, and the first operation has been to put up a tight matched-board partition covered with asbestos to separate this space from the rest of the basement. Such changes of heating, plumbing and light fixtures as were necessary were then in order, after which the walls and piers of the building were supported upon steel girders and excavation carried on to the proper depth, bringing the new foundations up to the old. While the operations of building the tunnel were under way the street surface was kept covered with a timber bridging flush with the pavement for the maintenance of street traffic, the earth being taken out of the trenches through small hatchways near the curbs. As the tunnel was completed the street was backfilled and paved temporarily on a gravel base, this pavement being frequently renewed until the final pavement is put in after the settlement of the underlying earth has ceased.

The twelfth report states that practically all the sewers, pipes and electric conduits in Washington Street between Boylston Street and Court Avenue were relocated. Sewage was carried in temporary pipes or boxes and new sewers were built in adjacent streets. Later, pipes which interfered with the tunnel structure were relaid in advance of the roof construction: gas pipes were cut as soon as exposed and replaced by temporary 3-in. steel pipes, and electric cables were bared and bent up out of the way. The general arrangement as far north as Franklin Street is as follows: Sewers are built on either side of the tunnel; electric conduits are laid deep in the gutter, passing below the catch basins, electric light and telephone conduits on opposite sides and water pipes are laid between the gas pipe and the telephone conduit, leaving a space between the conduits and the water pipes for service gates and manholes. A clear space is reserved at the proper depth for fire pipes.

Examination of the concrete of the East Boston tunnel has been made from time to time. In addition to surface inspection, four samples of concrete have been cut out. One of these was tested at by hammer inspection and found to be excellent. Three were tested at the Watertown Arsenal and showed very satisfactory strength. Their resistance to compression was 4360, 5200 and 6260 lb. per square inch, respectively.

The report of the commission to the Legislature of 1906 is printed in full bearing upon the development of future subway systems in Boston. This report has been abstracted in these columns and deals in a comprehensive way with the general subject. Since its publication a number of important developments have been authorized by the Legislature and these include the Cambridge subway, with terminus at Park Street, and an east and west subway from Park Street to the vicinity of the Back Bay Fens and Harvard Bridge. One of the most interesting points in the report is the discussion leading to the conclusion that the maximum capacity of a surface track is about 160 cars per hour under Boston conditions. The commission estimates that the maximum capacity of a subway track for surface cars is about 240 cars per hour.

An important point brought out in the twelfth report is the need in the future of a cross-town subway further to the South than the East Boston tunnel. There is already considerable demand for such a line. It could be met at any time by means of a deep tunnel passing under the north and south lines, having footway connections with stations on those lines. There are two obvious routes for such a cross-town line. One is under Summer and Winter Streets, which might be a part of a line under the Common to the west or a part of the proposed Cambridge subway. The other line would connect Park Square with the South station.

The thirteenth annual report includes detail descriptions of the recently constructed sections of the Washington Street tunnel, the cost of various portions of the work, tabulated statements of progress up to the close of the month of June last, and a careful account of the methods of supporting the principal buildings whose foundations were encountered in the progress of the tunnel along the narrowest part of Washington Street. The treatment of the Ames Building was a problem of special difficulty. All the platforms in the tunnel are of sufficient length to handle eight-car trains. Some of the station details are of special interest, notably the design of the State Street station. This is to be a single-platform station for north-bound trains only. It is connected by stairways and passageways with the platforms of the Devonshire Street station of the East Boston tunnel and has common entrances therewith through the easterly part of the Old State House. A passageway over the platform connects with the platform near Water and Milk Streets for south-bound cars. Thus through the entrances in the basement of the Old State House one can reach cars going north, south, east and west. The Union-Friend station has two platforms, 350 ft. long and 12 ft. wide, directly opposite each other. Connection will be made to the present Haymarket Square subway station. The latter will be greatly enlarged in the expectation of a large transfer traffic here between the trains of the tunnel and the surface cars of the old Tremont Street subway.

In the appendix of each report is a reprint of the recent subway acts of the Legislature.

THE TIME-TABLE IMPOSTOR

The notice published last week of the time-table impostor has called attention to the fact that he has operated in more cities than one. The first complaint came from Rockland, Maine. J. W. Ogden, superintendent of the Concord, Maynard & Hudson Street Railway Company, also seems to have had some experience with him, but fortunately was not victimized. On his visit to Mr. Ogden the swindler claimed to have come from Pittsfield, and under false pretences obtained a letter from Mr. Ogden, which was to be used only in the town of Maynard for one afternoon. The company soon found that he had been misrepresenting matters and the next day when he telephoned for an actual contract was told to return the letter and under no circumstances to use it again. He continued to do so, however, and succeeded in getting money from several concerns under the plea that he would place their advertisements in time-tables which never materialized.

The Indianapolis, Columbus & Southern Traction Company during the revivals at the Methodist Church in Columbus carried passengers at half fare.

COMMITTEES OF ENGINEERING ASSOCIATION

President F. G. Simmons, of the American Street & Interurban Railway Engineering Association, announced the following committees last week:

COMMITTEE ON "WHAT IS ECONOMICAL MAINTENANCE"

Chairman, F. H. Lincoln, assistant general manager Philadelphia Rapid Transit Company, Philadelphia, Pa.

W. H. Collins, general superintendent, Fonda, Johnstown & Gloversville Electric Railway, Gloversville, N. Y.

John Lindall, superintendent motive power and machinery, Boston Elevated Railway Company, Boston, Mass.

Fred Heckler, superintendent motive power and cars, the Lake Shore Electric Railway Company.

W. H. McAloney, superintendent rolling stock, Denver City Tramway Company, Denver, Col.

T. Scullin, master mechanic, Cleveland Electric Railway Company, Cleveland, Ohio.

Sylvester Potter, master mechanic, Detroit United Railways Company, Detroit, Mich.

COMMITTEE ON POWER GENERATION

Chairman, Wm. H. Roberts, superintendent motive power, Northern Ohio Traction & Light Company, Akron, Ohio.

G. H. Kelsay, superintendent of power, Indiana Union Traction Company, Anderson, Ind.

C. F. Bancroft, superintendent motive power and machinery, Boston & Northern Street Railway Company, Boston, Mass.

G. O. Harvey, electrical engineer, International Railway Company, Buffalo, N. Y.

Geo. B. Dusenberry, consulting engineer, Cleveland, Ohio.

R. A. Dyer, Jr., assistant general manager, Rochester, Syracuse & Eastern Railroad Company, Newark, N. Y.

COMMITTEE ON POWER DISTRIBUTION.

Chairman, W. J. Harvie, chief engineer, Utica & Mohawk Valley Railway Company, Utica, N. Y.

G. D. Nicholl, electrical and mechanical engineer, Indianapolis & Cincinnati Traction Company, Rushville, Ind.

W. H. Matthews, superintendent lines, Denver City Tramway Company, Denver, Col.

Jas. Heywood, superintendent lines and cables, Philadelphia Rapid Transit Company, Philadelphia, Pa.

Jas. P. Boyden, superintendent wires, Boston Elevated Railway Company, Boston, Mass.

COMMITTEE ON OPERATING AND STORAGE CAR HOUSE DESIGNS

F. F. Low, architect, Boston Elevated Railway Company, Boston, Mass.

E. F. Rogers, chief engineer, Boston & Worcester Street Railway Company, Boston, Mass.

J. W. Harper, master mechanic, Capital Traction Company, Washington, D. C.

Fred N. Bushnell, Stone & Webster Engineering Corporation, Boston, Mass.

In addition to those just appointed the Engineering Association has committees on standardization, control, maintenance and inspection of electrical equipment, way matters and car wiring. The membership of these committees was published in the issue of this paper for Jan. 4, 1908.

QUARTERLY MEETING OF THE NEW YORK STATE STREET RAILWAY ASSOCIATION

President T. W. Wilson, of the Street Railway Association of the State of New York, has announced that the association will hold its next quarterly meeting at Albany at 9:30 a. m. on March 18. The meeting will be held at the Fort Orange Club. The subject to be discussed is the "Classification of Operating Accounts," with particular reference to the proposed classification of the Interstate Commerce Commission. A full attendance is desired.

The Ft. Wayne & Wabash Valley Traction Company has put on five additional through limited cars between Ft. Wayne, Indianapolis and Lafayette. This required a new schedule which was put into effect Feb. 12.

TEST OF NEW STRANG GASOLINE-ELECTRIC CAR

On March 7 a trial run from Philadelphia to Wilmington and return on the tracks of the Baltimore & Ohio Railroad was made with a new Strang gasoline-electric car built by the J. G. Brill Company. Among those present were James Rawle, president of the J. G. Brill Company; J. G. Fareira, Brazilian Minister to Mexico; Count Angus Harperi, of Paris; Judge C. Mayer, of New York City; Division Superintendent Voorhees, of the Baltimore & Ohio Railroad; R.



INTERIOR OF GASOLINE-ELECTRIC CAR

Buckwalter, of the electrical department, and G. B. Koch, of the test department of the Pennsylvania Railroad; William B. Strang, L. G. Neilson and W. K. Beard.

The Strang system was described in the STREET RAILWAY JOURNAL for March 3 and Aug. 18, 1906. The latest car, the Irene, differs in a number of particulars from those

TRIAL OF A NEW FENDER ON THE CHICAGO CITY RAILWAY

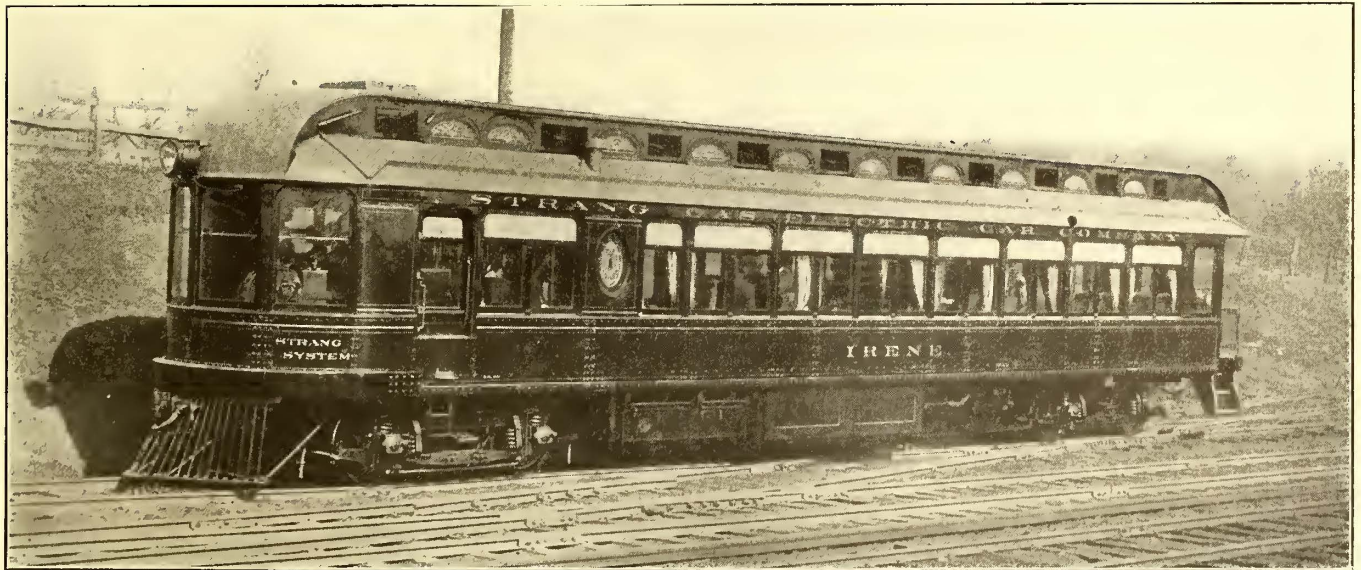
The Chicago City Railway Company has equipped one of its new pay-as-you-enter double truck-cars with an experimental fender of the shear-guard type. On Sunday, March 1, a test was made of this fender with a manikin figure in the presence of officers of the railway company and members of the Board of Supervising Traction Engineers. The test was successful in every way, the manikin being thrown to the outside without being dragged or carried under the wheels.

The fender consists of a vertical plank, 12 in. x 2 in., carried on stout brackets under the front platform with



END VIEW OF SHEAR-GUARD FENDER IN CHICAGO

a piece of rubber hose fastened along the bottom edge. It extends from the inside front corner of the car back at an angle of about 45 deg. to a point just outside and forward of the outside wheel of the front truck. On the back of the plank are mounted two brackets carrying swivel-pivoted, cast-iron wheels, 8 in. in diameter. These wheels



EXTERIOR OF GASOLINE-ELECTRIC CAR

already built, although it is equipped, as the others, with a gasoline engine driving a generator and with a storage battery. The multiple unit system of control is employed.

The frame of the car is entirely of steel, and it is divided into three compartments, being designed to carry 75 passengers. In the first compartment is the gas-electric engine of six cylinders. It carries sufficient gasoline to run 200 miles and the consumption is said to be 0.5 gal. per mile.

are set about 1 in. below the bottom edge of the plank and carry the fender when the car oscillates or when the paving between the rails is higher than normal. The plank is free to slide vertically on the brackets, by which it is carried, and when the carrying wheels come in contact with the ground the plank rises sufficiently to be always about 2 in. above the ground surface between the rails. It is practically impossible for even a hand or a foot to

become jammed under the fender, which has sufficient weight to keep it always down close to the surface. The fender was designed, built and applied at the railway shops.

After the test the Board of Traction Engineers authorized the Chicago City Railway Company to equip one hundred of its cars with fenders of this type. They will be tried out in service before any final decision is made as to the future standard type of fender.

A NEW CURTAIN FIXTURE

A closed groove ring fixture which combines the good points of the company's standard ring fixture and in addition has several new features is the latest modification of the Curtain Supply Company's curtain fixture, being especially adapted for use on semi-convertible cars. The fixture is self-righting, the flange on the head and the confining steel strip preventing the fixture escaping from the grooves. The peculiar form of the head and flange are said to make it impossible for the fixture to bind. It can



VIEWS OF THE CURTAIN FIXTURES, SHOWING THE FLANGE AND THE APPLICATION OF THE CONFINING STRIP

be operated with or without the handles and is adjustable to any variation in window openings. With the fixture in its holding position, the upward pull of the roller causes the rings to rock or jam against the bottom of the grooves and thus hold the curtain in any desired position. The jar or movement of the car will not cause the fixture to creep up, but the curtain may be readily pushed up or pulled down by hand by grasping any point along the bottom.

When the curtain is pulled down the rings recede or rock away from the groove bottoms and the fixture then rests on the anti-friction rollers at either end of the shoes and is free to run. The moment the hand is removed from the curtain the upward pull of the roller is again exerted and the rings immediately rock against the groove bottoms and hold the fixture firmly in place. The ring fixture requires a groove $\frac{3}{8}$ in. wide and $\frac{1}{2}$ in. deep under the confining strip, and the confining strip should be so placed that the opening is $\frac{3}{8}$ in. wide.

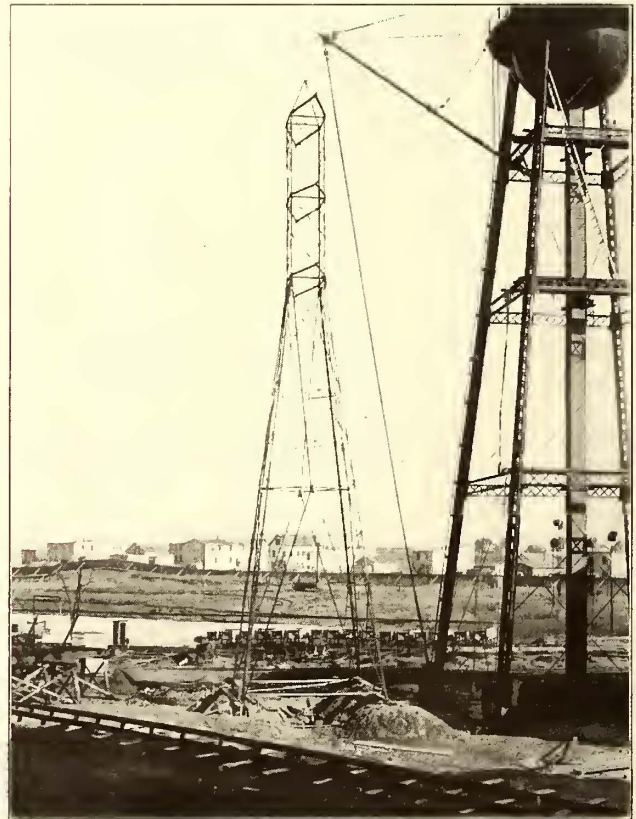
CIRCULAR ON WOOD PRESERVATION

The United States Forest Service has issued Circular 139 entitled "A Primer of Wood Preservation," which tells how decay can be retarded, describes certain preservatives and processes and gives examples of the actual saving effected by the use of preservatives. As an example is taken a post of loblolly pine, which costs, untreated, about 8 cents, or, including the cost of setting, 14 cents, and lasts about two years. Compounding interest at 5 per cent, the annual charge of such a post is 7.53 cents; that is, it costs 7.53 cents a year to keep the post in service. Preservative treatment costing 10 cents will increase its length of life to about eighteen years. In this case the total cost of the post, set, is 24 cents, which compounded at 5 per cent, gives an annual charge of 2.04 cents. Thus the saving due to treatment is 5.49 cents a year. Assuming that there are 200 posts per mile, there is a saving each year for every mile of fence of a sum equivalent to the interest on \$219.60. The circular can be had free upon application to the Forester, Forest Service, Washington, D. C.

GALVANIZED STEEL POLES FOR ELECTRIC POWER TRANSMISSION LINES

The Great Western Power Company, of California, has adopted a galvanized steel pole for carrying its high voltage power transmission line. As power is transmitted on two circuits of three wires each, carrying 100,000 volts, the pole is designed with three crossarms, it being intended to carry a feed wire on the outer end of each crossarm by suspended insulation. The top of the pole is arranged to take a guard wire. The poles are intended to be used about 750 ft. apart. The bottom of the lowest crossarm is 51 ft. 2 in. above the ground level, and the second crossarm is 10 ft. above the first, and the third crossarm is 10 ft. above the second. The extreme top of the pole carrying a guard wire is 5 ft. 1 in. above the bottom of the highest crossarm. The feed wires are 17 ft. 1 in. from each other in a horizontal plane for the two upper crossarms, and 18 ft. 1 in. for the lowest crossarm, thus making all feed wires 6 ft. 5 in. from the nearest part of the pole proper measured in a horizontal direction.

The bottom of the pole at the ground level occupies a base 17 ft. square. The stub ends of the pole are separate pieces of steel of such length as to allow of six feet for



SIDE VIEW OF POLE AS ERECTED BEFORE SHIPMENT

bedding in the ground. These poles are constructed entirely of structural steel shapes and are designed to follow the theoretical stresses and produce a pole of given strength and stiffness, with a minimum amount of material. All of the material, except bolts and nuts, is galvanized by the hot process before shipment, and after all the shop work has been done. The poles are all put together with bolts, and were assembled at the site of the power transmission work. They were made by Milliken Brothers, of New York.

The accompanying engraving shows a side view of the pole, which is the structure at the left in the illustration. The poles are stiff enough to be erected in one piece.

FINANCIAL INTELLIGENCE

WALL STREET, MARCH 11, 1908.

The Stock and Money Markets

There has been a material improvement in the stock market during the past week. Trading, although somewhat more active, has been largely of a professional character, but at the same time the sentiment in financial circles was much more cheerful than for a long time. The better feeling that prevailed was due in a large measure to the marked improvement in underlying conditions. The monetary conditions both here and abroad have worked decidedly easier. In the local market money has been offered with considerable freedom on call, and bankers and other lenders at times have experienced difficulty in placing their balances even at the prevailing low rate of $1\frac{3}{4}$ @ 2 per cent. Time money continued in very moderate supply, but in the absence of an urgent demand, rates for all periods up to six months have eased off a fraction. The position of the local institutions has been further strengthened by the influx of currency from the interior seeking employment here, and the surplus of the Clearing House institutions, according to their last statement, amounted to more than \$30,000,000. The improvement in the foreign money markets was reflected by a reduction in the Bank of England discount rate to $3\frac{1}{2}$ per cent, the lowest rate put into effect in several years. The Imperial Bank of Germany also lowered its minimum discount rate. Other favorable developments included the improvement in the iron and steel industry, and many other branches of trade, including an improvement in the copper metal situation. The decision of the court allowing a large trust company that closed its doors during the October panic to reopen for business later in the month also had a very favorable effect upon sentiment. These influences more than offset the cutting of dividends by some of the copper and other mining companies, and the continued shrinkage in gross and net returns reported by the leading railroad companies, and prices for practically all issues shared in the general improvement. Some of the noteworthy strong features were Union Pacific, Louisville & Nashville, Reading, New York Central, Delaware & Hudson, St. Paul & Pennsylvania. In the industrial quarters, the shares of the United States Steel Corporation were conspicuously strong. At the close of the week the market suffered a slight reaction on profit-taking and short selling, but the undertone was firm.

The trading in the traction stocks was just about of the same character as that in the rest of the list, representing to a great extent the work of inside pools to create a degree of confidence in the various securities. In Inter-Met. business was confined almost wholly to the $4\frac{1}{2}$ per cent bonds, which were made active at frequent intervals and advanced moderately at times, leaving the net results at the end of the week small and unimportant. There was a better defined movement, though, in Brooklyn Rapid Transit. The pool supposed to represent new interests in that stock that was credited with advancing the price from below 30 to 45, and liquidating above 40, is understood to have again taken hold of Brooklyn Rapid Transit and to have been quietly accumulating it for several days. It is generally understood that the basis for the pool work is the physical condition of the property, resulting from the expenditure of \$30,000,000 in the last eight years.

Philadelphia

Although the dealings in the local tractions continued upon a moderate scale, there was a decided improvement in prices, in sympathy with the upward movement in the general securities market. A noteworthy feature of the week-end trading in these shares was the improved demand, and the lighter offerings. At the beginning of the week, more or less irregularity attended the trading, but this was followed by a general hardening of values. Philadelphia Rapid Transit, for instance, after selling as low as $14\frac{5}{8}$, advanced to 16, and held all of the gain, while Union Traction, after a decline from $48\frac{1}{2}$ to $47\frac{3}{4}$, advanced to 49. Philadelphia Traction was extremely quiet, at

$18\frac{5}{8}$. American Railways sold at $42\frac{3}{4}$, and Consolidated Traction of New Jersey brought $64\frac{1}{2}$. In the investment shares, sales of Frankfort & Southwark Passenger were recorded at 383, and of United Companies of New Jersey at $238\frac{3}{4}$ @ $238\frac{1}{2}$.

Chicago

Trading in the Chicago tractions was again light, but the general trend of values was toward a higher level. Early in the week, sales of South Side Elevated were reported at 58, but subsequently the price advanced to 60. Northwestern Elevated 4s sold at 88 $\frac{1}{8}$, and Chicago Railway 5s sold at $95\frac{3}{8}$. A good demand exists for the 5 per cent bonds of the Chicago Railways Company. It is understood that of the \$2,500,000 of the bonds offered by the Banking Syndicate a week ago, all but \$750,000 has been disposed of.

Other Traction Securities

In the Boston market trading was fairly active, and after early weakness prices for all of the leading issues hardened. Boston Elevated, after selling at 127, rose to 128, and West End common rose from 83 to $84\frac{5}{8}$, and the preferred to $98\frac{1}{4}$. Boston & Suburban common advanced a point from the low price to 10. Boston & Worcester sold at $127\frac{7}{8}$ @ $133\frac{3}{8}$ and the preferred at 55. Manhattan Electric sold at $9\frac{3}{4}$ and the preferred advanced from 42 to $43\frac{1}{2}$. In the Baltimore market, interest centered largely in the United Railways issues, all of which displayed strength. The 4 per cent bonds advanced from $82\frac{3}{4}$ to $83\frac{7}{8}$, the incomes from $46\frac{1}{4}$ to $46\frac{7}{8}$, and the refunding 5s from $72\frac{3}{4}$ to 74. North Baltimore Railway 5s sold at $110\frac{1}{2}$, and City & Suburban 5s at 108.

Cleveland Electric stock took a spurt upward on the Cleveland Exchange the latter part of the week and at one time reached 46 for delivery in 30 days and 45 for cash. The range from 43 to 45 was maintained for some time, but the closing quotations this week were $43\frac{1}{4}$ bid and $45\frac{1}{4}$ asked. The strength shown was probably due to indications of settlement between the city and the company or guesses to that effect. Many small lots of Washington, Baltimore & Annapolis pooling certificates sold at prices ranging between $11\frac{1}{2}$ and $11\frac{3}{8}$, while a few shares of Northern Ohio Traction & Light common changed hands at $19\frac{3}{4}$ and 20. Other traction issues were quiet.

Security Quotations

The following table shows the present bid quotations for the leading traction stocks and the active bonds as compared with two weeks ago:

	Feb. 25.	Mch. 3.	Mch. 10.
American Railways	$42\frac{3}{4}$	43	$41\frac{1}{2}$
Boston Elevated	126	128	127
Brooklyn Rapid Transit.....	$40\frac{1}{2}$	$40\frac{3}{4}$	$42\frac{1}{2}$
Chicago City	$117\frac{1}{2}$	$117\frac{1}{2}$	173
Cleveland Electric	42	42	46
Consolidated Traction of New Jersey.....	63	$63\frac{1}{2}$	64
Detroit United	33	31	30
Interborough-Metropolitan	$63\frac{1}{4}$	$7\frac{5}{8}$	7
Interborough-Metropolitan (preferred)	$17\frac{3}{4}$	$19\frac{3}{4}$	18
International Traction (common).....	33	—	33
International Traction (preferred)	48.	60	$60\frac{3}{4}$
Manhattan Railway	121	120	125
Massachusetts Elec. Co. (common).....	10	10	$9\frac{1}{2}$
Massachusetts Elec. Co. (preferred).....	42	41	44
Metropolitan Elevated, Chicago (common).....	47	48	44
Metropolitan Elevated, Chicago (preferred).....	45	44	44
Metropolitan Street	46	16	17
North American	$42\frac{3}{4}$	$42\frac{3}{4}$	$45\frac{3}{4}$
Philadelphia Company (common).....	36	36	$34\frac{1}{2}$
Philadelphia Rapid Transit.....	15	$14\frac{1}{2}$	$15\frac{5}{8}$
Philadelphia Traction	$86\frac{1}{2}$	$86\frac{1}{4}$	—
Public Service Corporation certificates.....	58	58	58
Public Service Corporation, 5 per cent notes.....	—	—	—
South Side Elevated (Chicago).....	65	60	60
Twin City, Minneapolis (common).....	80	81	—
Union Traction (Philadelphia).....	49	48	48

a Asked.

Metals

The iron and steel markets continue to improve. Mills are reopening, orders are coming in better and the demand for steel rails is larger. The United States Steel Corporation is now operating about 52 per cent of its capacity, as against 45

per cent in operation a month ago. The copper metal market also shows improvement. Preparations are being made to re-open some of the mines that have been closed down for some time. The demand from consumers, while not large, is sufficient to hold prices steady at 12 $\frac{3}{8}$ c. @ 12 $\frac{5}{8}$ c. for lake, 12 $\frac{1}{4}$ c. @ 12 $\frac{1}{2}$ c. for electrolytic and 12 $\frac{1}{8}$ c. @ 12 $\frac{3}{8}$ c. for castings.

INCREASE IN TRAFFIC IN NEW JERSEY

It is stated that the street railway department of the Public Service Corporation of New Jersey experienced a large increase in traffic for February of this year as compared with the corresponding month of last year. Unofficially it is said 231,801 more car miles were covered than in February, 1907, and the increase in the number of passengers carried during the month was 1,500,000, which means 50,000 more passengers carried daily and 7,700 additional car miles covered during the same period. It is said that the first of the new pay-as-you-enter cars will be placed in operation about April 1.

NEW ORLEANS RAILWAY & LIGHT REPORT

The New Orleans Railway & Light Company has issued its pamphlet report for the year ended Dec. 31, 1907. The income account compares as follows:

GROSS EARNINGS		1907.	1906.
Railroad department.....		\$3,987,733	\$3,724,272
Electric and gas departments.....		1,893,685	1,875,400
Miscellaneous		159,873	173,518
Total		\$6,041,291	\$5,773,190
EXPENSES		1907.	1906.
Railway department.....		\$2,411,759	\$2,225,580
Electric and gas departments.....		858,638	848,435
Total		\$3,270,397	\$3,074,015
Net earnings.....		\$2,770,894	\$2,699,175
Interest, taxes, etc.....		2,025,618	1,900,900
Surplus		*\$745,276	\$798,275
Preferred dividends.....		312,500	500,000
Surplus		\$432,776	\$298,275

*After allowing for the full 5 per cent on the \$10,000,000 preferred stock, the balance for the common is equal to 1.22 per cent on the \$20,000,000 outstanding.

Traffic statistics compare as follows:

	1907.	1906.
Revenue passengers carried.....	78,879,204	73,606,068
Transfers redeemed	7,590,597	7,220,152
Revenue mileage	18,332,961	17,718,107

WINNIPEG ELECTRIC STREET RAILWAY

The Winnipeg Electric Street Railway Company reports for the year ended Dec. 31, 1907, compared as follows:

	1907.	1906.
Gross receipts.....	\$1,722,407	\$1,416,305
Operating expenses.....	775,731	701,964
Net earnings.....	\$946,677	\$714,341
Fixed charges	386,667	251,038
Surplus	\$560,009	\$463,303
Dividends	373,137	248,668
Surplus	\$186,872	\$214,635
Previous surplus.....	619,438	546,903
Total surplus	\$806,310	\$761,538

Total surplus as above Dec. 31, 1906, was \$761,539, from which was deducted \$142,100 for stock dividend, leaving \$619,438; adding surplus from operations of 1907, \$186,872, makes total surplus Dec. 31, 1907, \$806,310. Passengers carried, 20,846,317 in 1907, against 17,229,554 in 1906. Capital stock outstanding Dec. 31, 1907, \$5,320,950 (and \$679,050 subscribed and in course of payment), against \$4,375,200 Dec. 31, 1906; bonds, \$5,400,000; due Bank of Montreal, \$701,329, against \$334,912.

INTERBOROUGH RAPID TRANSIT REPORT FOR QUARTER AND SIX MONTHS

The Interborough Rapid Transit Company's report, including Manhattan Division, for the quarter and six months ended Dec. 31, 1907, compares as follows:

	1907.	1906.
Oct. 1 to Dec. 31:		
Gross receipts	\$6,301,496	\$5,815,232
Operating expenses	2,602,095	2,365,166
Net earnings.....	\$3,699,401	\$3,450,066
Other income	306,941	194,657
Total income	\$4,006,342	\$3,644,723
Interest	\$275,000	\$150,000
*Taxes	475,715	368,017
Rentals	1,993,036	1,954,889
Total charges	\$2,725,751	\$2,472,906
Surplus	1,280,591	1,171,817

	1907.	1906.
July 1 to Dec. 31:		
Gross receipts	\$11,456,623	\$10,307,253
Operating expenses	5,220,662	4,497,464
Net earnings	\$6,235,961	\$5,809,789
Other income.....	596,522	343,729
Total income	\$6,832,483	\$6,153,518
Interest	\$550,000	\$300,000
*Taxes	812,224	652,212
Rentals	3,982,577	3,751,903
Total charges	\$5,344,801	\$4,704,115
Surplus	1,487,682	1,449,403

*Includes special franchise and miscellaneous taxes amounting to \$367,567 in 1907 and \$287,102 in 1906.

Interest, taxes, and rentals for the years 1907 and 1906, include proportion for the period of the annual amount, whether paid or not.

Interborough Rapid Transit Co.'s general balance sheet as of Dec. 31, 1907, compares as follows:

ASSETS.		1907.	1906.
Construction, lease and equipment.....		\$34,232,433	\$27,367,467
Stocks and bonds.....		19,597,899	21,011,896
Other permanent investment.....			1,487,288
Surplus on hand.....		939,369	798,895
Accrued interest and dividends.....		139,259	
Due by agents, etc.....		102	1,415
Brooklyn & Manhattan Railroad.....			2,618,843
Due by others.....		14,002	10,566
City of New York in suspension.....		*324,402	384,576
Open accounts		4,902,803	240,725
Cash		739,756	914,042
Manhattan general fund.....		4,057,987	4,057,986
Prep. taxes and insurance.....		66,613	108,357
Loans		7,847,000	3,995,000
Sundries		63,565	458,745
Total.....		\$72,925,190	\$63,455,807

*States taxes paid under protest.

LIABILITIES.		1907.	1906.
Capital stock		\$35,000,000	\$35,000,000
Premium on capital stock.....			
Fund debt		25,000,000	15,000,000
Loan and bills payable.....		5,120,173	5,285,000
Interest due and accrued.....		266,667	100,000
Rent due and accrued.....		1,181,514	746,720
Equipment repair, reserve.....		103,458	
Manhattan Railway lease account.....		377,322	377,322
Taxes in litigation.....		2,605,311	3,958,398
Due wages		179,208	143,008
Due for supplies, taxes, etc.....		1,356,247	551,002
Open accounts		500,570	708,248
Sundries		97,797	207,060
Profit and loss surplus.....		1,136,923	1,739,046
Total.....		\$72,925,190	\$63,455,807

FIGURES OF CHICAGO ELEVATED TRAFFIC—OTHER EVENTS

Directors of the South Side Elevated Railroad have declared a quarterly dividend of three-fourths of 1 per cent on the company's stock, thus reducing the rate of dividend from 4 to 3 per cent a year. The first dividend on the stock of the reorganized company was in May, 1899, when 1 per cent was paid for a period of four months. In June, 1901, the amount was raised to 1 per cent quarterly.

The South Side, the Metropolitan and the Northwestern Elevated Railway Companies report increases in traffic for February over that of the corresponding month last year. The daily average number of passengers carried by the three roads in February compare as follows:

METROPOLITAN.				
	1908.	1907.	Increase.	Per cent.
January	141,564	150,165	*8,601	5.73
February	145,427	154,443	*9,016	5.84
SOUTH SIDE.				
	1908.	1907.	Increase.	Per cent.
January	112,707	92,411	20,296	21.96
February	111,927	96,094	15,833	16.47
NORTHWESTERN.				
	1908.	1907.	Increase.	Per cent.
January	100,392	88,632	11,760	13.27
February	102,182	88,435	13,747	15.55

*Decrease.

These average figures eliminate the condition that the past month had one more day than February a year ago, which had only 28 days.

The ordinance of the Calumet & South Chicago Railway Company has been practically completed. All that remains is to insert the figures showing the present value of the property. This company is to be a consolidation of the Calumet Electric and South Chicago City railway companies, and the purpose is to improve the service in the territory south of the Chicago City lines.

For the second time within a year the Chicago-New York Electric Air Line Company was thrown into the hands of a receiver March 5, the action having been instituted before Judge John A. Richter in the Indiana Circuit Court at Laporte. The following day Mr. Mull, the receiver, was dismissed. In the preceding last August Mr. Mull also figured as receiver for forty-eight hours, when he was dismissed by Federal Judge Kohlsaat. Attorneys representing the defendant companies established to the satisfaction of Judge Richter that there was no warrant for the action. They agreed to give a bond for the protection of stockholders whose interests, it was held, had been jeopardized.

Alderman Foreman, chairman of the city council committee on local transportation, has received a letter from President Clarence A. Knight of the Chicago & Oak Park Elevated Railroad Company in which was signified the willingness of the company to co-operate in the plan of giving elevated road patrons a ride to any point reached by any of the elevated lines for 5 cents and providing for long hauls without change of cars. Mr. Knight suggested, however, certain concessions by the city as a condition. One of them was that several matters which have been pending before the committee for the last three years be taken up and disposed of, one of them the elevation of the tracks of the Chicago & Oak Park Elevated Railroad from Fifty-second avenue to Austin avenue.

In all, \$5,000,000 of bonds of the Chicago Railway Company have been subscribed.

Action by the bondholders of the Chicago & Milwaukee Electric Railroad, the Wisconsin corporation, last week makes almost certain an issue of receivers' certificates for a sum not to exceed \$1,000,000 for the completion of the interurban road. An agreement reached between the holders of the bonds, representing a majority of the issue of \$10,000,000, resulted in the naming of a committee consisting of John V. Clark and C. B. Shedd, of Chicago, and Miller Lash, George A. Somerville and Robert Cassels, of Toronto, to represent the bondholders with authority to consent to an issue of receivers' certificates not to exceed one-tenth of the bond issue. All holders of these bonds will be requested to deposit them either with the Chicago Title & Trust Company, or with the National Trust Company, of Toronto, an order of the court having first been entered giving its sanction.

AFFAIRS IN NEW YORK

The Federal receivers of the New York City Railway Company and of the Metropolitan Street Railway Company have filed in the United States Circuit Court a petition on behalf of the two companies and others for authority to issue receivers' certificates to the amount of \$3,500,000 for such expenditures as are directly beneficial to the property of the Metropolitan Street Railway Company. The burning of 334 cars in the fire at the Ninety-sixth Street car barn caused the petitioners to seek authority to issue \$1,000,000 more certificates than was at first intended. A hearing on the motion for the issue of the receivers' certificates will be given on March 19 in the United States Circuit Court.

William R. Willecox, chairman of the Public Service Commission, said last week that work on the new plans for the Fourth Avenue subway was nearing completion, and that the commission might be in a position to advertise for bids within a fortnight.

The Interborough Rapid Transit Company has made formal application to the Public Service Commission for authority to execute a mortgage of all its real property and all of its interests as lessee of the rapid transit railroads, and other property described in its proposed mortgage, to secure not to exceed \$55,000,000 face value of forty-five-year gold mortgage bonds, dated Nov. 1, 1907, payable Nov. 1, 1952, with interest at a rate to be fixed by the directors from time to time, payable semi-annually, principal and interest payable in gold. Such bonds to be subject to purchase at 110 and accrued interest through sinking fund of \$300,000 per annum, beginning Nov. 1, 1910. The company gives the purpose for which it desires to issue its bonds as follows: For purchase of retirement of \$15,000,000 4 per cent three-year gold notes maturing May 1, 1908, not exceeding \$18,000,000. For purchase or retirement of \$10,000,000 three-year 5 per cent gold notes maturing March 1, 1910, not exceeding \$12,000,000. The remainder of the bonds to be issued from time to time only for purposes enumerated in the trust deed, for improvements, additions to or in payment for lines of rapid transit railway in New York and other lines in said city owned or leased by a corporation at least 90 per cent of whose stock is owned by Interborough, or to fund indebtedness of said company contracted for said purposes, or indebtedness of any other company assumed. Current unsecured obligations, to meet which \$12,000,000 bonds are to be used, aggregate \$10,352,726, of which \$2,624,910 was incurred in excess cost of that part of the Brooklyn subway extension in operation Dec. 31, 1907, and \$7,727,816 on account of subway equipment under contracts with New York City. The company has not yet concluded negotiations for payment or extension of its 4 per cent three-year notes maturing May 1, nor for sale of the new bonds, and it may be necessary to issue promissory notes to extend the three-year notes, securing payment by pledge of \$18,000,000 bonds. The company therefore asks approval of issue of not over \$25,000,000 promissory notes, payable in not over three years, with interest not exceeding 6 per cent secured by pledge of not over \$30,000,000 of the new bonds.

A measure has been introduced at Albany proposing an amendment to the constitution to extend the debt limit of New York City, which provides that debts heretofore or hereafter incurred by the city to acquire property or construct railroads, docks or other city-owned improvements shall not be included in the debt limit if it shall appear upon a determination of the Appellate Division, that the city is receiving from them concurrent net income in excess of the interest on the total debts incurred for the improvement. This determination of the Appellate Division is to be made from time to time in relation to the same bonds, and no such determination shall exclude bonds from the debt limits for more than five years, without the necessity of their again being passed upon.

A bill has also been introduced at Albany which proposes several important amendments to the public service bill, passed last year by the Legislature. The first of the proposed amendments vests in the Mayor of New York the power to appoint the Public Service Commission for the First District and to name the chairman thereof. Second.—Minority representation; two members of the Public Service Commission for the First District to belong to the political party having next to the highest number of enrolled votes in the city of New York, and for the Second District to the political party casting next to the highest number of votes for Governor at the last preceding State election. Third.—The Governor and the Mayor are given

power of removal for cause of Commissioners in the Second and First Districts, respectively. Fourth.—Provision is made for one experienced railroad workman as Commissioner in each district. Fifth.—Mr. Palmer's bill provides that the terms of all the present commissioners shall expire on January 31, 1909; the Governor and Mayor are then to appoint each five commissioners, for each district, one to serve one, two to serve two and two to serve three years, respectively. Thereafter, the term of office shall be three years, and vacancies shall be filled by appointment for the unexpired term only. Sixth.—Mr. Palmer's bill reduces the salary of public service commissioners from \$15,000 to \$9,000, and that of the counsel from 10,000 to \$7,500. All salaries and expenses of the first district commission to be made a charge upon the city of New York.

The suit of Attorney General Jackson to forfeit the charter and franchises of the New York City Railways on the ground that the corporation has been insolvent for more than a year, ended, so far as the taking of testimony is concerned, before Justice Davis, in the Supreme Court Tuesday, March 10.

Counsel has advised the Public Service Commission that the board has no power to purchase the Steinway tunnel on behalf of the city. This decision ended, so far as the commission is concerned, the negotiations looking to the purchase and early operation of the tunnel. All that can be done, it is said, in the matter of the purchase of the tunnel by the city is for the Interborough Company, which owns the property, to appeal to the Board of Estimate.

BANQUET OF THE NEW ENGLAND STREET RAILWAY CLUB

The eighth annual meeting and banquet of the New England Street Railway Club will be held on Thursday evening, March 26, 1908, at the Hotel Somerset, Boston, at 6:30 p. m. This is one-half hour earlier than on former occasions and will give more time for the after-dinner speeches than on previous occasions. The speakers already announced include Hon. Eben S. Draper, lieutenant-governor of Massachusetts; Hon. James F. Shaw, first vice-president, American Street & Interurban Railway Association; Hon. T. E. Byrnes, vice-president, N. Y., N. H. & H. Railroad; Hon. George A. Post, president, Standard Coupler Company; Col. Frank L. Greene, editor, St. Albans (Vt.) *Messenger*. Music will be furnished by Stiles' Eighth Regiment Band. The price for banquet tickets is \$2.50 each.

The annual meeting of the club will be held at 3 p. m. of the same day at the Somerset. Balloting for officers will begin at that hour and the polls will close at 5 p. m.

CHANGES IN UNDERWRITERS' RULES

The Underwriters' National Electric Association has issued a bulletin which contains the committee reports and suggestions for changes in the "National Electrical Code," which will be considered at the meeting of the electrical committee to be held on Wednesday and Thursday, March 25 and 26, at the rooms of the New York Board of Fire Underwriters. It will be recalled that at the meeting of the American Street & Interurban Railway Engineering Association held at Atlantic City in October certain suggestions were discussed regarding the rules of the body, the vote being that the committee from the association take up the points in question with the committee from the Underwriters' National Electrical Association. The chairman of the committee on car wiring for the American Street & Interurban Railway Engineering Association, therefore, submitted suggestions for changes in rule 32, section f, paragraph 1; rule 32, section g, paragraph 2, and for rule 33, section e, paragraph 3, all of which have been considered by the underwriters' committee, with the result that the following changes and additions to the code have been recommended:

Rule 32, Section f, Paragraph 1.—Change to read as follows:

Each outlet to be provided with an approved porcelain receptacle, or an approved cluster, no lamp consuming more than 128 watts to be used.

Rule 32, Section g, Paragraph 2.—New sentence:

Truss plank heaters to be mounted on not less than one-quarter inch fire-resisting insulating material, the legs or supports for the heaters providing an air space of not less than one-half inch between the back of the heater and the insulating material.

Rule 33, Section e, Paragraph 3.—

Change "No. 00 B. & S. gage," in third and seventh lines of the paragraph, to "No. 0 B. & S. gage."

There are no other changes in rules 32 or 33 which the committee cares to recommend at this time.

THE PROGRESS OF LEGISLATION IN OHIO

The State Railroad Commission, in a report to the Governor of Ohio, has asked that laws be enacted giving it the same power over electric roads that it has over steam roads in regard to crossings. This was brought about through the accident at Toledo some time ago, when a train crashed into an interurban car and killed several people. It seems that the cause of the accident has been rather hard to ascertain.

The Johnson bills seem to have gained some headway in the Legislature within the past few days. The House committee on Cities has approved the bill, introduced by Stockwell, providing for granting franchises to railroad companies on streets where street railway companies have been operated without the consents of the owners of abutting property. Senator Schmidt has a similar bill in the Senate and the Cleveland men are doing all they can to get them through.

The committee has also approved a bill providing for a referendum vote on all franchises and contracts, but the initiative feature of the bill has been stricken out to accord with the platform adopted by the Republican convention. Senator Schmidt has thrown in a bill that will require all public utility franchises to be submitted to a vote of the people.

Senator Fred C. Howe has introduced a bill into the Ohio Legislature, which he believes will open a way to a settlement of the street railway controversy in Cleveland whether the present negotiations are successful or not. Under the bill this is to be accomplished by appropriation proceedings, either on lease or purchase by the city, in case the city and company cannot agree on franchise conditions, which seemingly means that Mayor Johnson will be enabled to take the Cleveland system under conditions fixed by himself, whether the company was willing or not, providing that satisfactory terms for leasing to the Municipal Traction Company are not made.

Senator Patterson has offered a bill giving interurban roads the right of eminent domain in crossing streets, alleys and highways, except where this right would conflict with present franchise laws. Electric railways will thus have the same rights that steam roads enjoy if this bill becomes a law.

INCREASE IN FARE IN PENNSYLVANIA

The Lehigh Traction Company has announced a readjustment of rates and zones along its lines, to take effect March 15. The only raise in fares will be on the Milnesville and Lattimer line, the rate to those places to be 10 cents hereafter instead of 5, as at present. The fare to Ebervale will be 10 cents hereafter instead of 5, while the rates to Jeddo, Drifton and Freeland, and to the South Side towns, will remain the same. The workmen's trips will be discontinued.

The announcement of the company is as follows:

Owing to the measured cost of labor, fuel, and material, it becomes necessary to rearrange the fares on the Lehigh Traction Company lines as follows:

FREELAND LINE.

Hazelton to the east end of Harleigh, 5 cents.
From the east end of Harleigh to Jeddo, 5 cents.
Jeddo to Freeland, 5 cents.

MILNESVILLE AND LATTIMER LINE.

Hazelton to Harleigh Junction, 5 cents.
Harleigh Junction to Milnesville and Lattimer, 5 cents.

SOUTH SIDE LINE.

Hazelton to Tresckow Junction, 5 cents.
Tresckow Junction to McAdoo, 5 cents.
Commutation books will be sold at 4½ cents per coupon, and will be good over five-cent zones as heretofore.

The coal companies operating the different collieries reached by our lines have been informed of the change in rates, and in some cases have expressed a willingness to take care of their employees by delivering to them a coupon, which, in connection with the regular commutation coupon, will permit the bearer to ride to different points for the same rate as heretofore charged.

Workmen trips will be discontinued, although the same num-

ber of cars will be at the disposal of patrons at rush hours, and all cars can be used at any hour by employees of the different coal companies.

The sale of school and workmen's books will be discontinued.

THE CLEVELAND SITUATION

Political matters and the destruction of the Lake View school, with its awful toll of lives, interfered materially with the negotiations between Mayor Johnson and F. H. Goff on street railway matters last week. Some progress was made, however, in the way of valuing the lines lying outside the city limits. The Mayor still maintains that these sections of the various lines have been operated at a loss, and that they should go in on the lease at their physical value alone. He said that the holding company would then have to provide some means of maintaining the loss on them. Mr. Goff thought otherwise, but expressed his willingness to reduce the figures to the lowest point within reason. Secretary Davies presented figures showing the present value of the franchises of the outlying lines to be \$354,000, instead of \$750,000, as claimed in the first report he made. He said he had not abandoned the rule by which he reached the first figures and still thought he was correct in his estimate, but that he had made the reduction simply because of the criticism that had been passed upon his first figures at a meeting in the Mayor's office later.

Prof. Bemis, superintendent of the waterworks, claimed that only by including no increase in the operating expense for the next three years and estimating the increase in earnings at 64 per cent. could he arrive at the figures which Mr. Davies presented last. He is evidently endeavoring to make his figures tally with the idea of the Mayor that the lines have no value whatever. In his estimate Mr. Davies reckoned that for every 30 per cent. increase in the number of passengers carried a 2 per cent. increase in expense would be incurred. Prof. Bemis held that the Lakewood franchise alone is losing the company about \$200,000 a year. On this basis the franchise would be worth less than nothing, if the prospects for profit in the future are not very bright.

At one of the meetings A. B. DuPont, president of the Municipal Traction Company, stated that he thought the Mayor wrong in his estimate of the proportion of fare earned by the inside and outside portions of the lines. He suggested that the average rate of fare, including transfers, be divided into the percentage of work done. He further suggested that the proportion for the inside lines should be the distance from the center of the Public Square to the city limits and that the proportion for the outlying lines be three-fourths of the mileage outside the city. The Mayor said that this would work more harshly on the Cleveland Electric than the rule he had adopted, three cents of the fare for the inside lines and the rest for the outside portions. He afterward offered to adopt Mr. DuPont's suggestion, however, if the Cleveland Electric officers desired it.

On Saturday the Detroit Avenue and Clifton Boulevard grants outside of the city limits were taken up specifically and it was decided that the Mayor's rule of 3 cents of the fare for the inside line and 1.76 cents for the outside should be used in fixing the value for the outside portions. Whether the same rule will be used with the other lines remains to be decided. If so, modifications will have to be made to fit the conditions, as the Clifton Boulevard line is one that has not been developed as yet. Considerable interurban business has been done over the line, however, and this will have to be taken into account, according to the assertion of Mr. Goff at one of the meetings.

Secretary Davies had objected right along to the rule that has been adopted for these lines, but stated frankly that he had not been able to arrive at one which seemed satisfactory to himself. President Andrews said that outside lines would prove a serious menace to the inside system, and that if he owned the inside lines he would pay a nice sum of money to get the extensions. He said he thought that the lines outside of the city could be operated successfully by a company and that it would find some way to get to the center of the city with its passengers.

The city council will grant the Cleveland Electric a further extension of five weeks on its West Side franchises in order that the negotiations may proceed without hindrance. The short franchise granted some time ago expired on March 11. The

next short term will include the time for the meeting of the stockholders of the Cleveland Electric and the Forest City Railway Companies, after which more will be known as to the course that will be taken.

At one of the meetings Mr. Goff said the average growth of the business of the Cleveland Electric for the past thirteen years had been 8 per cent. compounded. Since the business of the company now is being affected somewhat by the financial depression, the subject of the panic of 1893 and the strikes on the local system have come up for mention from time to time.

At the meeting Tuesday, March 3, some discussion of the prices named Saturday took place. Mayor Johnson indicated that his figure is the maximum, less what he is willing to give for good will. He reiterated his statement that the lines outside of the city are valueless and that Mr. Goff should not attempt to make a charge for a perpetual lease when he does not care about a contract of that kind. Mr. Goff did not make any random statements as to what he would do, but said that if the report that the directors of the Cleveland Electric have fixed a maximum limit on the price of stock he did not know anything about it and if he did he could not abide by it, as he is as free now as ever in the negotiations. If the agreement, if one is reached, is not ratified by either side, he said, he could not help it.

Some discussion took place at one of the meetings regarding the use of a pay-as-you-enter car and Mayor Johnson asserted that this is the best type of car for use in any city. He will no doubt insist upon their use on the system, if it is leased to a holding company.

MEETING OF THE SCHENECTADY SECTION OF THE A. I. E. E.

A very interesting address was delivered before the Schenectady Section of the A. I. E. E. on Feb. 29, by G. E. Emmons, works manager of the General Electric Company, on "An Outline of Management of the Schenectady Works." Mr. Emmons spoke briefly of the time when, in 1881, he was engaged as bookkeeper for the American Electric Company, in New Britain, Conn., where Prof. Elihu Thomson was chief engineer, and E. W. Rice his assistant, and where only a small number of hands were employed. A short time after this, the Brush Electric Company, of Cleveland, purchased most of the stock of the company. Certain capitalists in Lynn, Mass., however, became interested in the company, purchased it, changed its name to the Thomson-Houston Electric Company, and in 1883 moved the business to Lynn. Mr. Emmons traced the growth of the company to the time of its consolidation with the Edison Company in Schenectady, and its absorption of several smaller companies. He referred to the panic of 1893, and the action of the board of managers in concentrating the business at Schenectady, although at that time the Lynn factory was the most important.

A plan of the Schenectady Works in 1893 was shown, and compared with a plan of the works at the present time. In 1893 the floor space covered by buildings was six acres, and number of hands employed 2800; whereas in 1907 floor space was 89 acres, and 15,300 hands were employed.

A synopsis of the system under which the plant is managed was given. The manufacturing committee passes upon requests for appropriations, and discusses and decides policies, subject, however, to the approval of the Executive Committee. The plant is divided up into sections, each section being under the supervision of a section superintendent, he in turn being under the supervision of the general superintendent, and he, together with the electrical and mechanical superintendents, works engineer, etc., is under the works manager.

Mr. Emmons went somewhat into detail regarding the work of the production department, referred to as the most important department; also the cost department, and method and importance of knowing just what apparatus costs. Methods of paying for labor by day work, piece work and the premium system were mentioned, the latter being explained as follows: A premium is given if a piece of work is done in less time than it was estimated it would require, the premium consisting of an equal division of the time saved; that is, the employe is paid at the regular day rate for the number of days it takes to do the work, and is also paid at the same rate for one-half the time saved.

BOSTON ELEVATED WITHDRAWS MERGER BILL

General Wm. A. Bancroft, president of the Boston Elevated Railway Company, has requested the Legislative Committee on Street Railways to withdraw House Bill No. 613, which provided for power to acquire and hold the stock and securities of other electric railways in addition to certain express and freight privileges. Gen. Bancroft states that the company does not desire to press the bill at this time against any substantial opposition, though he believes that the acquisition of tributary surface lines by the main terminal company of the Metropolitan District is for the public benefit and in line with modern development in other large cities.

The opposition of the Public Franchise League to the measure, as expressed in a circular published against the bill, is characterized as misleading and unfair. House Bill 613 has nothing to do with the so-called inequalities in street railway fares. Limits for single fares are usually determined by municipal limits rather than on any scientific basis, and there is probably no street railway in the country where a passenger going in one direction cannot ride farther for a single fare than if he goes in some other direction. The present limits of the five-cent fare cannot be enlarged unless the Boston Elevated Railway Company voluntarily consolidates with or leases other lines of railway. The Elevated Company can, in connection with its own properties, manage at least some of the tributary suburban lines with greater economy and give better public service than is being done at present. The simplest and best way would undoubtedly be for the elevated to combine with or lease such lines. That cannot be done without extending the five-cent fare beyond all reasonable limits.

SALE OF EXETER, HAMPTON & AMESBURY PROPERTY

The property of the Exeter, Hampton & Amesbury Street Railway Company was sold at public auction on March 10 for \$250,000 to Charles H. Penny, of Hartford, Conn., who represented a committee of the bondholders of the company. The company operates 21.6 miles of line, connecting Exeter, Hampton, Hampton Beach, Hampton Falls, Seabrooke and Smithtown. It owns and controls Central Park, Dover, N. H., and Seabrooke Beach and The Casino, Hampton Beach.

STREET RAILWAY PATENTS

UNITED STATES PATENTS ISSUED FEBRUARY 25, 1908.

[This department is conducted by Rosenbaum & Stockbridge, patent attorneys, 140 Nassau Street, New York.]

879,847. Safety Controlling Mechanism; Thaddeus R. Bell, New York, N. Y. App. filed April 11, 1907. Means for automatically controlling the speed of trains when approaching a curve. Employs mechanism actuated from the horizontal pivotal movement of the truck relative to the body of the vehicle, and connected to actuate the throttle.

879,885. Interlocking Relay; Edward McClintock, St. Paul, Minn. App. filed April 30, 1907. A relay mechanism whereby a signal will be operated when the train is movable in one direction, but will be silent or in-operative when the train is moving in the opposite direction.

879,886. Highway Crossing Signal for Electric Roads; Edward McClintock, St. Paul, Minn. App. filed April 30, 1907. Relates to modifications of the above particularly adapted for use at a crossing.

879,935. Railway Fish Plate; Gilbert T. Wilson, Wellington, N. Z. App. filed May 14, 1907. One of the fish-plates has lugs which engage corresponding holes in the web of the rails.

879,938. Railway Offset Joint; John H. Allen, East Orange, N. J. App. filed May 4, 1906. Comprises a main upright portion having a vertical offset therein, outwardly and upwardly beveled bearings at the upper edge of said main portion, outwardly and downwardly inclined flanges at the bottom of the main portion and a lower vertical portion depending from the flanges beneath the offset in the main vertical portion.

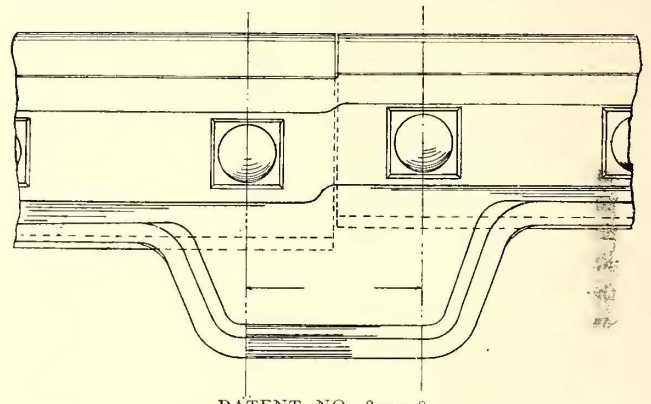
879,943. Trolley Pole Support; James L. Chase, Ayer, Mass. App. filed Aug. 23, 1907. A weighted arm is operative to raise the trolley pole through a gear segment and means for tripping the rack from the gear to retrieve the pole when the latter leaves the wire.

879,969. Brake Shoe; Louis E. Keller, Oil City, Pa. App. filed Feb. 27, 1907. A corrugated steel reinforcing strip is incorporated in the face of a cast-iron brake shoe.

880,021. Trolley; George H. Gross, Binghamton, N. Y. App. filed April 26, 1906. In place of the usual bearing, a fixed grooved ring is provided over which a trolley wheel of ring-shaped or annular form is positioned to rotate.

880,072. Railway Signal Apparatus; Frank Graziano, New Orleans, La. App. filed June 15, 1907. Comprises a grating having spaced bars and terminals arranged below the upper surface of the grating and arranged to form parts of normally open electric circuits and also arranged to enable tappets depending from cars to pass between the bars of the grating to complete the circuits.

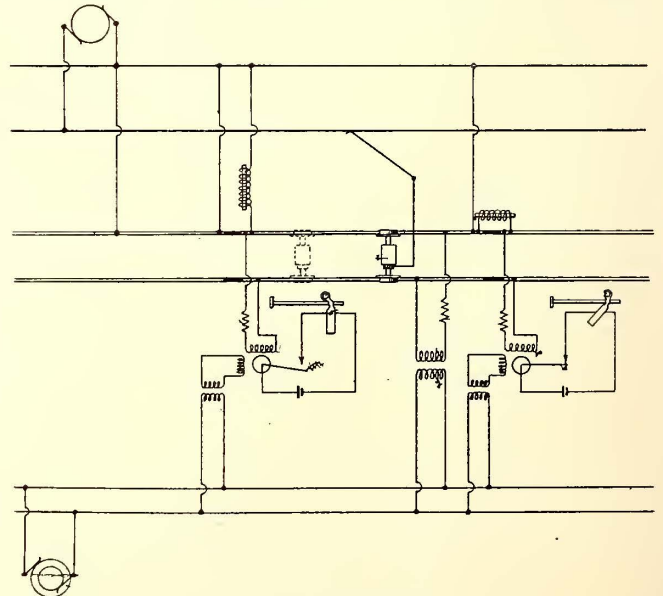
880,107. Electric Trolley; Leonard Smith, North Tonawanda, N. Y. App. filed Dec. 9, 1905. The trolley harp is so mounted



to the pole that a limited movement is permitted by virtue of a spring and bolt connection.

880,134. Alarm Signal Mechanism; Ellsworth E. Flora and Robert J. Zorge, Chicago, Ill. App. filed June 19, 1907. Means whereby indication is given to the engineer or motorman of the opening of a switch or draw. Includes an apparatus alongside the track rails for positioning a torpedo thereon in case the train approaches when the switch is open.

880,136. Signal System; Julien A. Gehrung, New York, N. Y. App. filed Feb. 2, 1907. Provides a signal system for use in rural sections of the country. Comprehends a semaphore



control of the line under the entire surveillance of the dispatcher at a city terminus and provides for telegraphic communication to the train at all times. This is accomplished by two simple conductors extending along the roadway. There is further provided means to give an indication or check on the accuracy of the same, so that any condition, such as broken wires, short-circuited wires, or leakage, is at once notified to the dispatcher's office.

880,218. Signal mechanism for Block Signal Systems; Harry L. Johnson, Topeka, Kas. Relates to signal mechanism for electric block signal systems. Has a main battery to alternately energize primary or main and secondary electro-magnets; a local battery and a local electro-magnet, a local signal circuit and

connections whereby the making of the circuit through the main battery will complete the local and signal circuits successively.

880,271. Method of Forming Rail-bonds, Etc. Eugene M. Bournonville, Jersey City, N. J. App. filed Sept. 20, 1907. Comprises heating the metal of the parts to be connected to a point short of the melting point, then increasing the temperature of one of said parts until a portion thereof melts and becomes unified with the heated portion of the other part.

880,328. Railway Signaling System; Wilmer W. Salmon, Rochester, N. Y. App. filed July 3, 1907. Details.

880,329. Railway Signaling System; Wilmer W. Salmon, Rochester, N. Y. App. filed July 3, 1907. A block signal system having sectionally energized track rails connected by inductive bonds which are used as return conductors for the power current. The blocks are sectionally energized by alternating current which are short circuited to operate the signals.

880,344. Rail Lift; Thomas J. Wasser, Jersey City, N. J. App. filed June 12, 1906. A rail lift having a longitudinal flat upper surface, a frame having miter ends and means for supporting the lift, the upper edges of the frame being on the same level with the flat surface, and a pin in the frame for joining the lift therewith.

880,395. Trolley Wheel Spring; Ralph E. Noble, Chicago, Ill. App. filed July 3, 1907. The harp has arms with longitudinal recesses therein, which recesses receive the looped portions of blade springs interposed between the wheel and the arms of the harp to establish good electrical contact.

880,398. Electro-mechanical slot for signals; George S. Pfisterer, Nashville, Tenn. App. filed Aug. 29, 1907. Relates to that type of signal operating mechanism known as "electric slot" or "electro-mechanical slot" for use more particularly on railways in which a signal set for safety or clear is, through the intermediary of electrically controlled appliances, shifted upon reversal of the normal condition of the electric circuit in which the governing electro-magnet is included.

880,477. Conducting Conduit for Vehicles; Francis M. Brinkerhoff, New York, N. Y. App. filed Mar. 12, 1907. Tubular passages in the car roof extend down through the pivots to the bogie trucks into the casings of the motors so as to cool the same.

PERSONAL MENTION

MR. BENJAMIN H. GLOVER has resigned as superintendent of motive power of the Metropolitan West Side Railway, of Chicago, Ill.

MR. W. F. McCLOUD, assistant auditor of the Indianapolis & Cincinnati Traction Company, at Rushville, Ind., has resigned, to become connected with the Prestolite Company, of Indianapolis, Ind.

MR. FRANK M. LOTT has resigned as chief wireman of the southern division of the Public Service Corporation of New Jersey to become master mechanic of the Green Bay Traction Company, of Green Bay, Wis.

MR. G. F. MOORE, general manager of the St. Joseph Valley Railway, at La Grange, Ind., has resigned to become inspector of general accounts for the interstate commerce commission, with headquarters at Washington, D. C.

MR. A. M. BARRON, general manager and treasurer of the Consolidated Light, Power & Ice Company, of Joplin, Mo., for many years, has been appointed general manager of the Citizens Electric Company, of Eureka Springs, Ark., operating the Citizens' Electric Railway, and the electric light and public utility plants.

MR. JOSEPH COLVIN has resigned as superintendent of the Washington, Alexandria & Mount Vernon Railway Company, at Washington, D. C., to accept a position in the general office of the company at Philadelphia. The operating work will be taken charge of by Mr. R. W. King, of Philadelphia, brother of Mr. Clarence P. King, president of the company.

MR. E. C. McCARTHY, purchasing agent of the Savannah Electric Company, of Savannah, Ga., has been appointed district manager of the southeastern states for Stone & Webster, succeeding Mr. H. H. Hunt. Mr. E. T. Steel, formerly with the Ponce Railway & Light Company, of Ponce, Porto Rico, has been appointed to succeed Mr. McCarthy at Savannah.

MR. FRANK T. BUCHANAN, who for the past few months has been in the statistical department of Stone & Webster, Boston, Mass., has been appointed superintendent of the Blue Hill

Street Railway, of Canton, Mass. Mr. Buchanan formerly was superintendent of the Cape Breton Electric Company, Sydney, N. S., and more recently was in charge of the Key West Electric Company's lines at Key West, Fla., both of which are operated by Stone & Webster.

MR. HUGH McCLOSKEY, of New Orleans, has been elected chairman of the board of directors of the New Orleans Railway & Light Company to share the duties of that office with Mr. E. C. Foster. Mr. McCloskey is president of the board of port commissioners of New Orleans and is prominent in business and banking circles. He is a member of the firm of McCloskey Brothers, wholesale grocers, and is vice-president of the Hibernian Bank & Trust Company and of the Hibernian National Bank.

MR. J. B. HANNA writes that he has not resigned as president of the Chicago, Lake Shore & South Bend Railway Company, of South Bend, Ind. The statement regarding Mr. Hanna's resignation originated in newspaper circles in South Bend and also appeared in the daily papers in the larger neighboring cities. Because of the positive nature of the items appearing in the press the statement was accepted as true and was published in this paper for Feb. 15. Mr. Hanna reports favorable progress in the building of the road, and says it will probably be placed in operation July 1.

MR. EDWARD B. KIRK, general manager of the Sterling, Dixon & Eastern Electric Railway, of Dixon, Ill., has been appointed general manager of the Atlantic Shore Line to succeed Mr. W. G. Meloon, whose resignation was noted in the STREET RAILWAY JOURNAL for March 7. Mr. Kirk is a graduate in electrical engineering of Purdue University and for several years was superintendent of the Jacksonville Railway & Light Company, of Jacksonville, Ill. Later he was appointed electrical engineer and master mechanic of the Grand Rapids, Grand Haven & Muskegon Railway, of Grand Rapids, Mich., and more recently was vice-president and general manager of the Winnebago Traction Company, of Oshkosh, Wis. He resigned from this position last July to become general manager of the Sterling, Dixon & Eastern Electric Railway at Dixon, succeeding Mr. Henry C. Higgins.

MR. EDWARD J. MOORE, of Philadelphia, has been elected a director of the South Jersey Gas, Electric & Traction Company to fill the vacancy caused by the death of Mr. Thomas C. Barr, noted in the last issue. The board adopted a resolution expressing regret at the loss of a valued member and condolence with his family. The board of directors of the Public Service Corporation also adopted a minute respecting the death of Mr. Barr, who was a member of the board. In its reference was made to Mr. Barr's work in consolidating the street railway companies in Essex, Hudson and Union counties and equipping the properties for operation by electricity, which work, the minute states, was marked by a high degree of courage and success. Continuing, the minute states that to Mr. Barr's foresight and energy the public and the company are indebted in a large measure for the extension of the company's system of street railways.

MR. CHARLES B. HOUCK, whose appointment as general manager of the Wilkes-Barre & Hazelton Railway Company, of Hazelton, Pa., to succeed in that capacity Mr. A. Markle, who heretofore has acted as president and general manager of the company, was noted in the last issue of the STREET RAILWAY JOURNAL, was born at Shippensburg, Pa., Jan. 21, 1861, and was educated at the public schools in Carlisle and at Dickinson College, from which he graduated in 1889. Mr. Houck's first business connection was with the Haxton Steam Heating Company, of St. Joseph, Mo., with which he remained until 1891, when he entered the service of J. G. White & Company, being engaged by them as superintendent of construction of the electric railway between Providence, Peckville and Taylorville, which work was completed in 1892. In 1893 he entered the service of the Lehigh Traction Company as superintendent of construction, and while holding this position supervised the building of eleven miles of new line. In 1896 he was appointed superintendent of shops and line for the company, and in 1898 was made electrician in charge of the power house, shops, etc. In 1902 he became connected with the Wilkes-Barre & Hazelton Railway Company, for which he served during the construction of the line as superintendent in charge of the electrical work. In 1906 he was made general superintendent of the Wilkes-Barre & Hazelton Traction Company and the Lehigh Traction Company, which position he held up to the time of his appointment a few weeks ago as general manager of both of these companies.

NEWS OF THE WEEK

CONSTRUCTION NOTES

Items in this department are classified geographically by States, with an alphabetical arrangement of cities under each State heading.

For the convenience of readers seeking information on particular subjects, the character of the individual item is indicated as follows:

- * Proposed roads not previously reported.
- o Additional information regarding new roads.
- † Extensions and new equipment for operating roads.

Numerals preceding these signs indicate items referring to:

1. Track and roadway.
2. Cars, trucks and rolling stock equipment.
3. Power stations and substations.
4. Car houses and repair shops.
5. Parks and amusement attractions.

* STEVENSON, ALA.—A ten-year franchise has been granted to C. A. Sutliff and associates, of South Pittsburg, Tenn., for operating an electric light and power system in Bridgeport, also the construction of a street railway system. It is the intention of this company to construct an interurban system to connect the towns of Bridgeport, Copenhagen, Richards City, South Pittsburg and Jaspén, Tenn.

† LONG BEACH, CAL.—It is stated that F. A. Crowe has sold the franchises which he recently purchased from the city to George H. Bixby, who is said to be acting for the Pacific Electric Company.

4 † LOS ANGELES, CAL.—The Los Angeles-Pacific Railway Company has begun excavation for a temporary station to be built on the west side of Hill Street, between Fourth and Fifth Streets. The structure will occupy ground space 80 x 319 ft. It will be one story high and will be used until such time as the company is ready to build a permanent station there.

1 † RIVERSIDE, CAL.—An agreement was made on March 2 by which the Riverside & Arlington Railway Company will operate the electric railway which is building to the cement plant to Crestmore, five miles west of Riverside. By this deal the Huntington interests are given a franchise out of Riverside and for a distance of five miles toward Los Angeles.

3 † SAN BERNARDINO, CAL.—A contract has been signed under the terms of which the Pacific Light & Power Company will supply the San Bernardino Valley Traction Company with the necessary current to operate its system. The Pacific Light & Power Company will bring its power for the traction system from its plants in the Santa Ana Cañon.

3 † MIDDLETOWN, CONN.—Manager L. S. Riley, of New Britain, announces that an arrangement has been made by the Connecticut Company whereby all the current for the operation of its cars will be furnished by the Hartford Electric Company in New Britain, Berlin and Plainville, from its power plant at Dutch Point on the Connecticut River. Heretofore power has been supplied from the Connecticut Railway & Lighting Company's power station at Bull's Bridge, 55 miles away.

1 † WASHINGTON, D. C.—The Senate has passed a bill authorizing the Baltimore & Washington Transit Company to extend its lines in the District of Columbia.

1-2 † TAMPA, FLA.—The Tampa Electric Company has built a mile of track to extend the Michigan Avenue division to Twenty-second Street and approximately one-half mile out Seventh Avenue to the tracks of the Tampa Northern Railroad. The company also erected a large storage shed for its cars opposite the old car house in Ybor City, to take care of its new cars. Between November, 1906, and November, 1907, the company received and put into service 18 new twelve-bench cars and one large closed car of the type used on the suburban line between Tampa and Port Tampa City.

o ATLANTA, GA.—The Atlanta & Carolina Railway Company has secured from Secretary of State Philip Cook an amendment to its charter, under which it is given the right to construct its line in other counties than those named in the original petition. The company seeks and is granted the right to construct into or through the counties of Newton, Wilkes, McDuffie, Lincoln, Columbia and Richmond, and also to lay its track on certain streets in Atlanta, which are mentioned in the petition and regarding which agreement has already been reached with the City Council.

o JESUP, GA.—D. G. Zeigler writes that it is expected to begin work on the Goose Creek R.R. & Power Manufacturing Company's line about May 1. The line will extend from Jesup to Docktown, a distance of

about 24 miles. The motive power will be electricity, and it is planned to operate 15 cars. The repair shops will be located in Jesup and the power station will be erected at Goose Creek. The company was incorporated on March 5 with a capital stock of \$300,000. D. G. Zeigler, of Columbia, S. C., is the chief engineer.

3 o LEWISTON, IDA.—It is reported that Frank McKean, trustee of the Oregon, Washington & Idaho Electric Railway Company, is negotiating for the purchase of the Pomeroy electric lighting and power plant. The transfer will be made to the North Coast Power Company, organized by Mr. McKean and associates. The Pomeroy Company has its power plant on the Tucanon Creek, seven miles from Pomeroy.

o TAYLORVILLE, ILL.—The City Council of Taylorville has granted a franchise to the St. Louis, Terre Haute & Quincy Interurban Company, permitting that company to run a line through Taylorville. Nearly all the right of way in Christian County has been secured by the company, and the farmers along the proposed route have pledged themselves to pay the company \$1,000 if the road is built.

* EVANSVILLE, IND.—The Evansville Terminal Railway, capitalized at \$200,000, has been incorporated to construct and operate, in Indiana and elsewhere, street and interurban railroads, and plants for the distribution of electric and other heat, light and power, and to deal in stocks and securities of other companies. The incorporators are Albert F. Karges, Marcus S. Sonntag, Wm. H. McCurdy, Jas. V. Rush and others.

o EVANSVILLE, IND.—We are advised by E. Q. Lockyear, secretary of the Evansville, Mt. Carmel & Olney Interurban Railway Company, that it is proposed to begin construction work about Aug. 1, 1908. The road will have a total length of 75 miles and will be built from Olney to Mt. Carmel, Ill., and from there cross the Wabash River to Evansville, Ind., serving several intermediate towns along the route. The company is capitalized at \$10,000. Adam Knopp, of Olney, Ill., is president and E. Q. Lockyear, of Evansville, Ind., is secretary.

o LAPORTE, IND.—Mayor Lemuel Darrow, of Laporte, has applied to the board of trustees of Gary for an extension of the franchise of the Gary & Interurban Company, which will soon expire, because that portion of the line has not been completed according to the requirements of the franchise.

o TERRE HAUTE, IND.—The Grand Central Traction Company has submitted a third proposition to the Board of Public Works for a franchise to enter Terre Haute. It is said that the line between Indianapolis and Evansville with the branch between Bloomington and Terre Haute is to be completed within the next three years. The company is seeking a private entrance to the city.

1 † WINONA LAKE, IND.—The Winona Interurban Railway Company has just closed a contract with the Pittsburg Underground Company for 526,000 lb. of copper wire with which to equip the Warsaw-Peru extension of the Winona Interurban line. The first consignment is to be delivered by March 15.

5 † IOLA, KAN.—Lee Massengale, superintendent of the Iola Electric Railway Company, states that George Davis, of Brooklyn, N. Y., will install a roller coaster at Electric Park this summer.

o TOPEKA, KAN.—A charter has been granted to the Kansas City & Kansas Southwestern R. R. Company, which has been organized with a capital stock of \$10,000,000, for the purpose of constructing an electric railway from Kansas City to Independence, Kan., and from Kansas City to Topeka. The directors of the company are as follows: E. M. Lambkin, Kansas City; C. S. Dudley, Minneapolis; S. W. Brewster, Chanute; H. E. Hopper, Indianapolis; J. E. Martin, Minneapolis; W. L. Moyer, New York.

o LEXINGTON, KY.—It is reported that Louis des Cognets and C. N. Manning, of Lexington, are planning to build an electric railway from Harboursville to Manchester, a distance of about twenty-four miles. It is hoped to have the matter in shape and the road completed this year.

* ANNAPOLIS, MD.—A bill was introduced by Senator Claggett last week to incorporate the Washington & Maryland Electric Railway Company. The capital stock is to be \$25,000 and the road will run from Washington to Ritchie Station, on the Chesapeake Beach Railroad, a distance of ten miles. The incorporators are Horace Crozier, Samuel C. Cox, T. Van Claggett, Snowden Hill, Alfred G. Shaw, Ernst Gerstenberg and Albert Carey.

3 † LAURIUM, MICH.—The Houghton County Street Railway Company has completed plans for the construction of a new power substation at Laurium and also the building of a considerable extension on the car house at that point, which is the center of the company's system in and around Calumet.

o MINNEAPOLIS, MINN.—It is stated that the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company will soon begin surveying its line out from Savage on the way to Northfield. The City Council of Rochester has just granted the company a franchise. It stipulates that the road should be in operation within three years.