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Stealing on Pay-as-You-Enter Cars

The arrest of two conductors in Newark last week, charged with stealing fares on pay-as-you-enter cars, brings up again the much disputed question of the extent to which passengers observe the work of the conductor or deliberately aid him in stealing from the company. The investigation of the secret service agents, which resulted in the arrest of these two conductors and the gathering of a large amount of evidence against other dishonest employees, showed that the system of stealing employed

depended on the deliberate assistance or careless indifference of passengers who disregard the rule that each passenger must deposit his fare in the fare box by his own hand. The usual method was to return to a passenger tendering a coin of large denomination an amount in change 5 cents less than the coin tendered. This 5 cents would go into the conductor's pocket. The passenger would have paid his fare, but not to the company. When it is possible for a man to be caught knocking down 62 fares in one day by this method, it is a pretty good indication that the general public is not much to be depended upon to assist the company in collecting its fares and discouraging dishonesty on the part of employees. There is room for some further development of a method which not only ensures that every passenger pays his fare, but that that fare finally reaches the treasury of the railway company.

Track in Paved Streets

The number of different forms of track construction for paved streets which have been tried out in the last few years is pretty good evidence that a perfectly satisfactory and practical design has not yet been developed. Nearly every roadway engineer has his own ideas about track construction and paving which he thoroughly believes are better than those of his contemporaries. The deplorable condition of the track in most cities and the pavements adjoining the track is enough, however, to satisfy unprejudiced persons that perfection has not been reached. We venture the opinion that there is hardly a piece of track which has been subjected to hard service for three years or more in any kind of paved streets which has not begun to show unmistakable signs of breaking down either its own foundation or that of the pavement adjacent to it. Three years is certainly too short a life for such an expensive part of a street railway company's property.

Track in paved streets is an entirely different proposition from open track laid in ballast. The ideal condition in ballasted track is uniform elasticity and yielding, each tie deflecting a like amount under passing wheel loads and every foot of the rails conforming to the same wave of vertical distortion. The ideal condition in track in paved streets, on the other hand, is absolute rigidity, with no movement of the rails or ties. The pavement on each side cannot move with the track. Unless there is absolute rigidity, the bond between the foundations of the track and the adjoining pavement will quickly break down and allow water to get under the concrete and begin its steady attack which in the end will destroy the entire substructure.

The principal difficulty in laying permanent track in

paved streets is to get a solid impermeable foundation strong enough to resist the pound of wheels and the action of water and frost. Municipal paving contractors are notorious for skimping and covering up their bad work. If they are permitted to lay the track foundation as well as the paving foundation, every foot of the work must be carefully watched. Some railway engineers prefer to do the paving between tracks with their own forces, but it is doubtful if in the long run this does much good. The work that they do themselves is usually first class, but they only lay the paving for which the company has to pay and the contractor who lays the remainder of the roadway is in a position to cause as much damage to the track by his poor work on the remainder of the street as if he laid the entire paving. If the roadway foundation is shallow and of poor quality so that water can work its way down to the subgrade, the pavement will begin to heave and crack and before long water will be under the track foundation as well.

The railway company is usually blamed for the bad condition of the paving long before its own track has begun to be seriously damaged. Heavy girder rails now generally used will stand up under heavy traffic for a long time before the joints begin to fail even when the foundation beneath is badly broken up. Nevertheless it is the pounding of the passing cars which assists the water under the concrete in breaking up the foundation and quickly destroying the paving. For this reason, the railway company is responsible to a large extent for the rapid spread of the initial failures due to poor work on the part of the contractor. A perfectly satisfactory track construction should be proof against its own weakness and the weakness of its surrounding structure as well.

It might almost pay a street railway company to go into the paving business and take the contract from the city to pave the entire street from curb to curb. In no better way could it protect its own property in the center of the street. The practical solution is, of course, to insist that the municipal contractor does a good job throughout or else make some arrangement with the city to pave with the company's own forces between the tracks and also a strip of the roadway three or four feet wide on each side of the track, receiving pay for that part of the work on the same basis as the contractor. The danger zone could thus be removed farther away from the actual track foundation and the life of the track would be correspondingly lengthened.

Making Electric Express Service Profitable

Despite the rapid growth of express and light freight handling on electric railways during the past few years, there are so many unsolved problems in connection with this branch of transportation that it is still very difficult to compare practice in different sections of the country, still more so to draw general conclusions as to profitable methods from the work of individual companies. There is no doubt, however, that the wide differences in practice noticeable at the present time among companies which have taken up the express problem in earnest might be decreased in extent if the weak spots were more generally appreciated before a road starts in to furnish these facilities. This is particu-

larly true in New England and the Southern Central States, where comparatively little headway has yet been made in this branch of the electric transportation business.

The experience of the local express companies operating in the suburban portions of some of the larger cities ought to show the electric railways in the territory that it is desirable to keep down the investment in express equipment to the lowest possible point. Recent analyses of the suburban express business in the vicinity of Boston presented before the Massachusetts Railroad Commission indicate that the profits of this work are far from exorbitant, and that the cost of maintaining teams and paying wages to the class of men required in a reliable express service is large enough to warrant great circumspection before establishing a full service from point of shipment to point of destination by the electric railway just beginning its work in this field. If the traffic grows without interfering to any serious degree with the conduct of the passenger service, it is not difficult to extend the equipment and increase the number of car movements as the situation demands. To saddle the express department of a company at the earliest stages of its work with costly terminal facilities and rolling stock, with delivery and collection wagons, and a longer payroll than is absolutely necessary, is to invite unduly high operating cost and fixed charges, which must be met before any profits can be divided. It is easy to spend too much for express cars in the early stages of such work, whereas, in not a few cases, one or two home-made merchandise cars with perhaps two motors each, geared for high enough speed to enable the cars to keep out of the way of the passenger service, may be adequate for a year or two after the company gets ready to handle express matter.

Closely associated with the temptation to invest in too much equipment is the operation of light freight cars on a too generous schedule. To a large degree the existence of competing steam lines in a territory will influence the frequency of service desirable, and in most communities outside the larger cities the local freight trains are not frequent enough to call for more than two express trips per day unless the traffic is heavy from the start. Nothing is to be gained by running off a higher daily car mileage for freight service than is absolutely necessary to meet the conditions. At first, also, it is generally a wiser plan to let the shipper bring his freight independently to the company's cars than to attempt to duplicate the service of the express organizations of national prominence, which have the advantage of many long hauls to offset the expenses of local collections and deliveries. When the business grows is time enough to institute transportation of merchandise outside the company's right of way.

Profitable express service on electric railways is quite as much a matter of favorable public opinion as it is a question of equipment, advertising, solicitation and frequency of car movements. In some sections the population has little conception of the usefulness of trolley express service and fears that if it is allowed abuses may result in the direction of attempting to do a steam-railroad business over city streets. This is the principal argument brought against the grant of any freight privilege when the question comes up in the City Council. It ought not to be difficult for the management to show conclusively, however, that in most

cases it is out of the question even to attempt such work as the haulage of trains of heavy freight cars over the sharp curves and stiff grades and the special trackwork which exist in city streets, with the limited power possessed by the electric road.

The final success or failure of electric freight service is dependent upon the cost to the shipper and consignee. In every class of public service the rate problem is complex in proportion to its importance, and no phase of electric railway management deserves more careful study than the rates on express matter. The transaction of a large volume of business at a moderate profit per shipment is a policy that has much to commend it. Instances are not wanting where an unprofitable electric express business has been made to show a balance on the right side by a reduction from the original tariff rates. The conditions in each case must be analyzed with great care before the justice of a rate can be determined, but while a rate in general somewhat higher than the competing steam tariff is usually proper, there is little doubt that a small profit per shipment incites a larger volume of business than stiff rates on low-grade merchandise.

Economy in Assembling Heavy Rolling Stock

When a new group of heavy cars is added to the equipment of an operating company no little embarrassment is sometimes felt in the repair shops on account of the lack of space and facilities for the proper assembly of the rolling stock. If it has been a good while since the company has purchased any new cars, it generally happens that the load on the shops caused by the requirements of regular maintenance has left little space to be assigned to the assembly of new equipment. The shop force is organized on the basis of routine repairs and inspections, and special tools and devices once available for assembly work have become either lost or obsolete. This is the time when it is most important for a company to realize the need of cutting loose from the old traditions of shop routine and establishing facilities for assembly in proportion to the number and character of new cars to be added to the road's equipment.

Something is to be said in favor of having the cars assembled at some point outside the company's system, provided it is not feasible to establish the necessary organization and shop facilities at home. It might well pay a small company under some conditions to make an arrangement with a neighboring larger road for the assembly of several new semi-convertible cars equipped with multiple unit control in the more roomy shops of the latter, supposing that the first company's own men bear the detailed responsibility of the work; but as such cars must sooner or later be maintained by the company to which they belong, it is better to do the work of assembly at home if it can possibly be arranged. As yet it does not seem to be generally feasible to buy new cars already set up, for bodies, motors, control, trucks, air brake equipment and interior fittings of certain kinds may be made by a dozen different manufacturers, and if the assembly takes place at any one of the regular factories the additional freight and other expenses would increase considerably the cost of putting the cars together over that obtaining in the shops

of the home company under the most favorable conditions. Again, the shipment of new electric cars over the tracks of a steam railroad is scarcely commendable, either from the standpoint of expense or safe transit, unless the bodies are shipped on flat cars in regular freight trains, and the balance of the car equipment separately. Even the bodies are now in some cases so large that it is a ticklish job for the railroad company to transport them within the clearance limits allowed, and there is little doubt that if complete cars were shipped as parts of regular freight trains, the volume of damage claims would be considerably larger. The final and most important reason for assembling new cars in the shops of the purchasing company is the exact knowledge which the mechanical department thus obtains of the construction of the equipment, and in no other way can a road so readily become acquainted with the advances in rolling stock equipment design which are constantly taking place. No matter how well the general principles of new control circuits, body, motor and brake designs may be understood by the mechanical staff of a company from the side of the drawings and specifications, the shop force needs the experience of fitting new parts together in order to be prepared to put the equipment back on the road quickly when it gets into trouble during its service.

Given an extensive job in the line of car assembly, the best results can usually be secured by organizing the work with great care before the shop force begins its task and by setting apart a portion of the shop for the exclusive handling of the problem. The greatest care ought to be taken to prevent delays in the conduct of the work, once the parts of the equipment are on the ground. To this end complete checking of all parts on a list specially prepared for each car, or so tabulated that each car's condition can at any time be noted, should be maintained. It is generally a mistake to put the equipment parts into the regular stock room of the shops as they arrive. A better plan is to establish a separate temporary stock room for the exclusive use of the new cars, and by this means to escape the temptation to use the new parts in old equipment repairs. If the regular parts of the new cars are stored in the ordinary stock room, the way is opened for misplacements and losses that occasion great embarrassment when the time comes for assembly, and the cost of setting apart a temporary stock room is slight in proportion to the benefits. It may even pay to install separate tool room facilities, with provision for grinding drills, reamers and other equipment without interference with the regular repair shop work.

As far as possible it pays to organize the shop force on erection so that each man will do the same general class of work, passing on from one car to another in rotation. One man will then devote his time to wiring up cabs for controller circuits, another to the installation of steel conduit on the under side of the car body, another to the assembly of multiple unit control parts, etc. In this way there will be little delay on account of men having to wait until others have finished before taking up their special duties on any portion of the equipment. Another loss which means considerable money on a long piece of work—the delay in changing jobs—is largely done away with when the men work in rotation, on the basis of making each man something of a specialist.

THE CAR EQUIPMENT DEPARTMENT OF THE INTERBOROUGH RAPID TRANSIT COMPANY—BRAKE SHOE STUDIES AND CHANGES

As a necessary factor in its problem of intensive deceleration, the brake shoe experience of the Interborough Rapid Transit Company naturally forms one of the most instructive chapters in the maintenance history of the car equipment. It is proper, therefore, to give a general survey of brake shoe practice in New York's heavy electric rail-

illustrated in Fig. 2 replaced that shown in Fig. 1. It was of similar metal, but was reinforced with the steel back, to hold the shoe together in the event of cracks—an occurrence very common with the hard metal used.

In 1903 the American Brake Shoe & Foundry Company replaced the cast lugs with a strip of wrought steel, as indicated in Figs. 3 and 4, to avoid any possibility of failure through breakage of lug. To increase the durability as well as the frictional qualities, the shoe was changed to the "U" type of shoe by the addition of extended ends heavily chilled

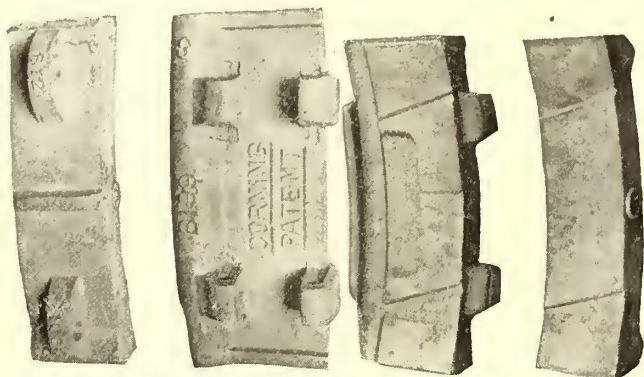


Fig. 1.—Square End Corning Shoe, Used on Manhattan Division Before 1902

way system so that the present methods and tendencies will be better understood. The company has made on both its subway and elevated divisions an extensive study of brake shoes and has tested all submitted for trial to determine the cost, life, reliability, retarding effect and influence on the wear of the wheel tread. The data derived from these experiments have been carefully analyzed by the engineers of the Interborough Rapid Transit Company. For the last six years the shoes designed and manufactured by the American Brake Shoe & Foundry Company have been used exclusively except in some competitive tests.

BRAKE SHOES ON THE MANHATTAN ELEVATED DIVISION

The motor shoe used on the Manhattan Elevated Railway Company is flanged and the trailer shoe unflanged. The design of the brake rigging on the Manhattan railway is

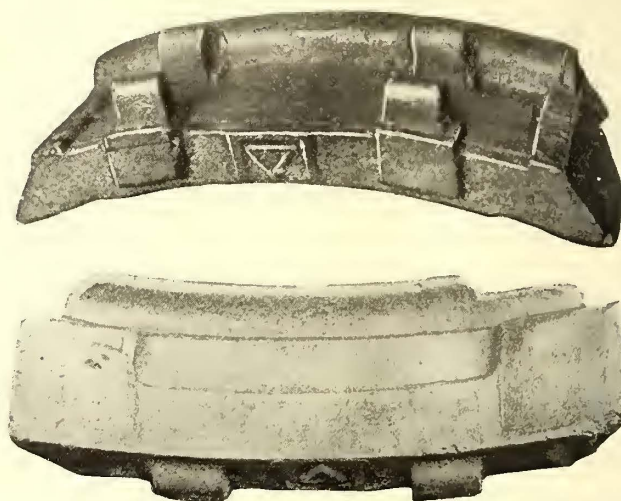


Fig. 4.—Manhattan Motor Shoe (Weight, 35 Lb.), 1903 Type

from the back, the face chill remaining as in Fig. 2. The same change was made in the trailer shoes, Fig. 6, as regards the extended ends, but as the lugs of the trailer shoe were very heavy they were not reinforced. Fig. 7 shows a section of the motor shoe indicating the amount of chill in the end of the shoe, and Fig. 8 gives a view of a scrap shoe of standard type. The original weight of this shoe (Fig. 4) is 35 lb. and the records made by the barn foremen for 10 weeks of 1908 showed an average weight when scrapped (Fig. 8) of 17.9 lb.; that is, about 49 per cent is available

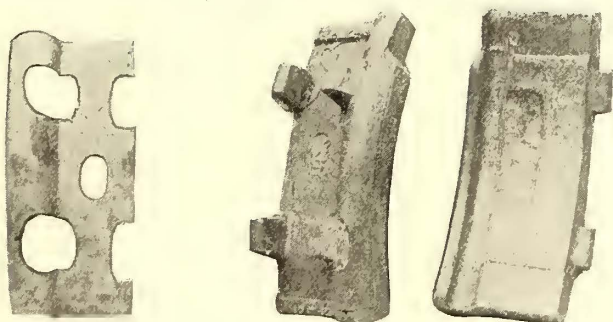


Fig. 2.—Steel Back Shoe Adopted on the Manhattan Division in 1902

not such as to permit of the use of an M. C. B. type brake head. In consequence the shoes have to be provided with a special method of attachment to the head, which in the case of the motor shoes consists of four posts and in the trailer shoes of two posts.

Previous to 1902 the shoes on the Manhattan Elevated Railway were of the Corning type with square ends, shown in Fig. 1. The body metal was of hard iron which was heavily chilled on the ends and face with box chills, and there was a supplementary middle chill on the tread portion of the shoe. In the fall of 1902 the motor brake shoe

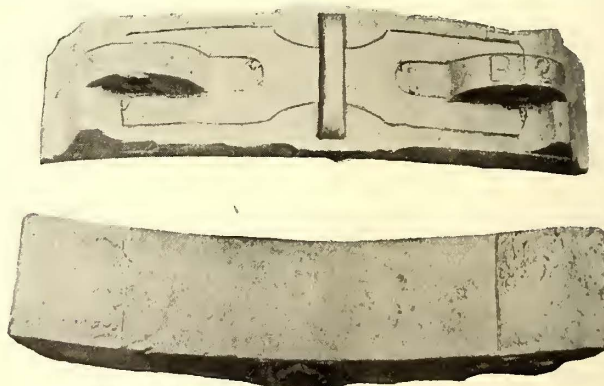


Fig. 6.—Manhattan Trailer, 1903 Type

for wear. Figs. 9 and 10 illustrate a Manhattan trailer shoe when new and when worn out. In this case the new shoe weighs 27 lb. and the scrap about 10½ lb., or 60 per cent wear.

There are practically no failures with the Manhattan shoes, either on account of breakage of the shoe and parts falling away, or evil effects on the wheel tread. The shoes are worn down to about ¼ in. in thickness, and in many cases have been worn clear to the steel back. As the motor and trailer shoes are a close fit to the wheels at the start, the scrap weight is very low and much less than

could possibly be accomplished with an un-reinforced shoe, while the advantage of being reinforced against failure in service makes this type of shoe a particularly satisfactory one for the elevated equipment, especially as pieces of the shoe will not fall to the street. The braking service on the Manhattan elevated service is excessive, equaling or exceeding that of any other elevated railroad. In one test, a train of six cars, consisting of four motors and two trailers, equipped with "U" shoes, has been stopped in an average distance of 224 ft. from a speed of 26 m.p.h., and in 542 ft. from an average of 41 m.p.h. The test was made with a train pipe pressure of 70 lb. and the piston travel was 4 in. to 4½ in.

BRAKE SHOES ON THE SUBWAY DIVISION

The cars of the subway division of the Interborough Rapid Transit Company were originally equipped with the

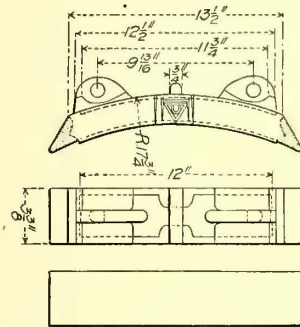


Fig. 5.—Manhattan Steel Back Brake Shoe for Trailer Trucks

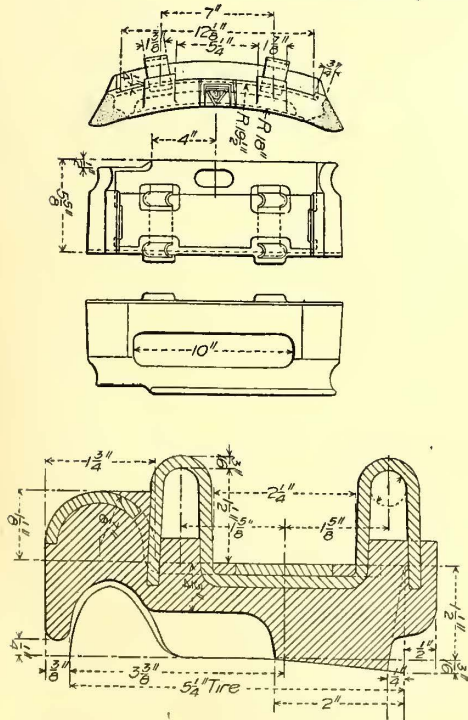


Fig. 3.—Design of Steel Back Brake Shoe for Motor Trucks on the Manhattan Elevated Division

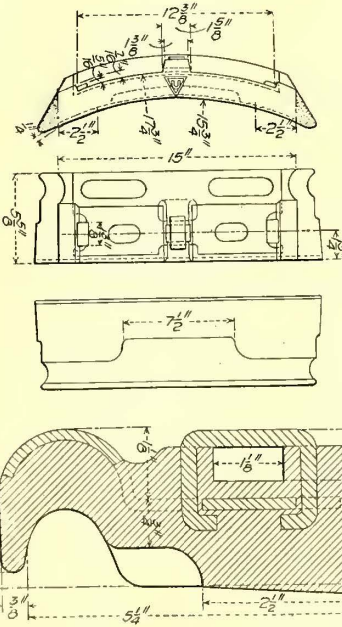


Fig. 12.—Motor and Trailer Shoe, Steel-Back "U" Type, Used Previous to March, 1908

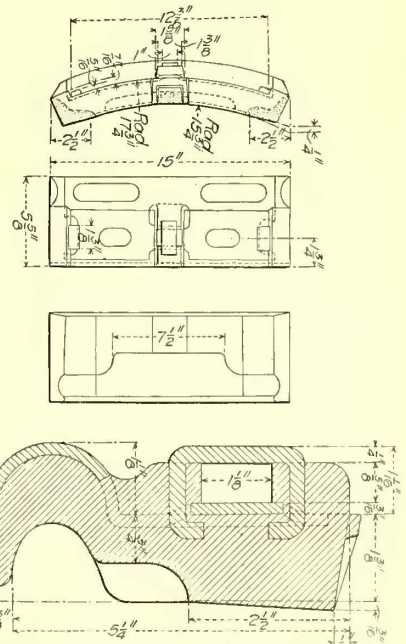


Fig. 14.—Present Subway Motor and Trailer Shoe of Steel Back Type, Center Chill, with Toes Cut Off

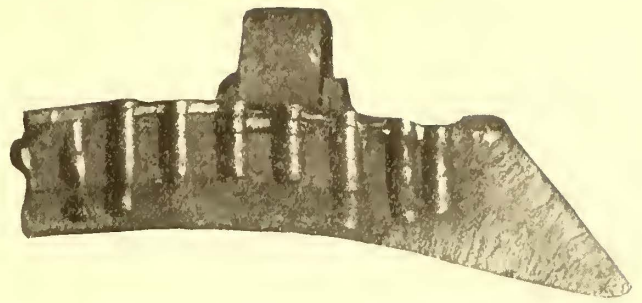


Fig. 7.—Section of 1903 Manhattan Shoe, Showing Amount of Chill in the Ends



Fig. 8.—Worn Manhattan Motor Shoe, Shown New in Fig. 4



Fig. 9.—Manhattan Trailer Shoe, Weight 27 Lb. Net, 60 Per Cent Wear



Fig. 10.—Manhattan Trailer Shoe, Scrap Weight 10 1/2 Lb., 60 Per Cent Wear

Diamond "S" type of flanged brake shoes, reinforced with a steel back and having a cast-iron lug to fit in a standard Christie head. The body metal was of soft cast iron. On the outer tread there was a bundle of expanded metal with a crucible metal insert at each end of the tread and

the elevated. This has stopped all trouble as regards undue wear of the wheel, and since that time the shoes have given very satisfactory service so far as the wheels were concerned. This change was made in the fall of 1905. Recently, however, it has seemed as if further improvement

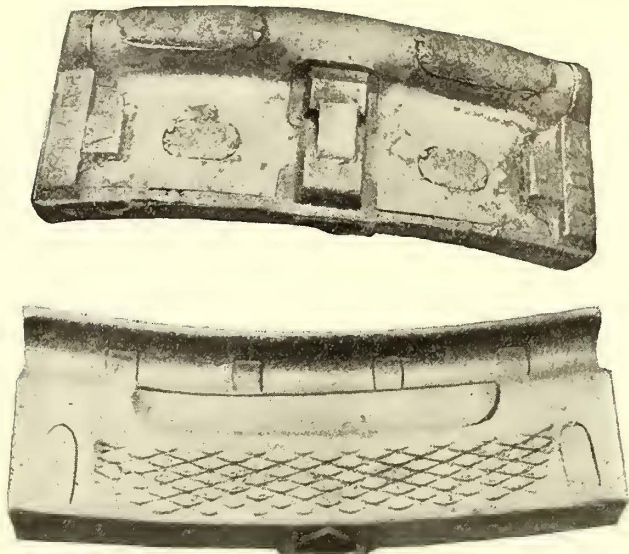


Fig. 11.—Early Subway Shoe, with Wrought Strip Reinforcement

four crucible inserts along the flanged groove. After a few months' service it was found that the cast lug was weak and unsatisfactory, and it was reinforced with a wrought strip, as shown in Fig. 11. This type of shoe was

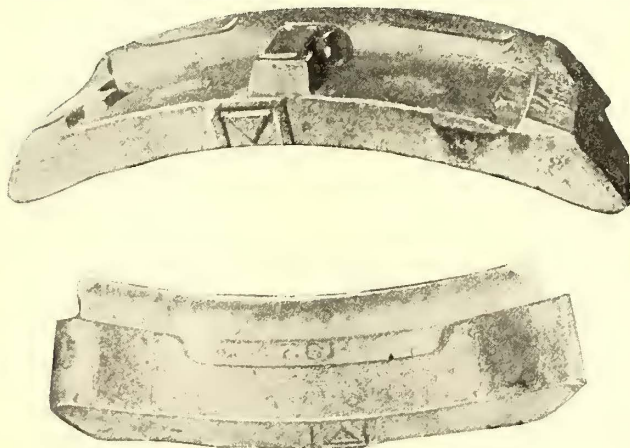


Fig. 13.—U-Type Shoe Adopted for the Subway Division in 1905, Weight 37 Lb., New

continued in use for several years. It was made up so that one pattern of shoe would apply to both motor and trailer wheels of 33 in. and 30 in. diameter respectively. The face of the shoe, therefore, was a compromise curve, taking the smaller wheels in the middle and the larger wheels at the end of the shoe; the brake head was the same on both motor and trailer equipment.

As the service increased and the demand on the brake shoe became greater with increase in the subway business and speed of operation, it became apparent that the insert shoes were in many cases wearing the flange and outer parts of the tread faster than the rail wore the inner part of the tread; that is, the wheels were being removed for worn outer treads and low flanges. To avoid this trouble, the insert shoes were replaced by shoes of the "U" type (Figs. 12 and 13) with a wearing face similar to those on

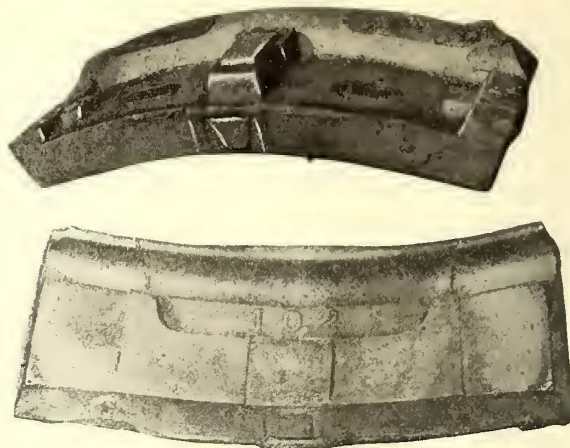


Fig. 15.—Front and Back of 1908 Type Subway Brake Shoe, Weight 33 Lb., New

was possible in the way of reducing scrap. Early in 1908, therefore, it was decided to take off the extended ends of the shoes and add an extra face chill to the middle of the tread portion, as shown in Figs. 14 and 15. The original weight of the new shoe by this plan has been reduced from 37 lb. to 33 lb., with a corresponding reduction of 4 lb. in scrap weight of shoes worn out on trailer wheels, while the brake shoes appear as effective as before. The effect of cutting off the extended ends of the shoe is shown in Fig. 16.

The braking service on the subway equipment is more severe than on any other railway in the country, whether steam or electric. The average number of stops per 1000 miles is nearly 3000 in the local service and about 1600 for the express service. The two classes of standard train



Fig. 16.—Worn Subway Shoe, 1907 Type, Dotted Lines Showing Where Toes Have Been Cut Off to Reduce the Scrap 4 Lb. Per Shoe

units compare as follows in weight and maximum running speed on level track.

COMPARISON OF SUBWAY LOCAL AND EXPRESS TRAINS

Weight of five-car subway local, consisting of three motor cars (78,000 lb. each) and two trailers (50,000 lb. each).....	167 tons.
Maximum speed of subway local between stations	30.5 m.p.h.
Weight of eight-car subway express train, consisting of five motor cars (78,000 lb. each) and three trailers (50,000 lb. each).....	270 tons.
Maximum speed of subway express trains between stations	37 m.p.h.

These frequent stops and high speeds between stations make the shoes and wheels very hot, so that the wear-

ing effect of the shoe on the wheel is excessive. So far there have been no failures by breakage of the steel back wrought lug shoes in the subway service. The high temperature which obtains in the shoe has a considerable effect in softening the large expanse of chilled section.

BRAKE SHOE COSTS

The accompanying brake shoe costs for the year ending June 30, 1907, are ample evidence of the greater requirements of the subway service:

	Subway	Elevated
Average cost per 1000 car miles.....	\$1.27	\$.53
Average cost per 1000 miles per shoe.....	.159	.066
Average cost per 1000 ton-miles.....	.038	.023
Percentage of wear obtained.....	47%	55%

On the subway division the same flanged shoe is used for both motor and trailer wheels, which range in diameter from 34 in. to 27 in. On the elevated division the trailer shoe is unflanged and gives about 70 per cent wear, while the flanged shoe used on the motor trucks gives a wear of about 60 per cent.

REHABILITATION OF THE METROPOLITAN STREET RAILWAY COMPANY'S ROLLING STOCK

The Metropolitan Street Railway Company is now engaged in thoroughly overhauling about 800 double-truck and 500 single-truck cars. The task of placing all of this rolling stock in first-class condition is rather a difficult one owing to the absence of shop facilities, which had been destroyed in large part by severe car house fires during the preceding two years. The double-truck cars are being overhauled at the Kingsbridge car house, where shop equipment has been installed, and most of the single-truck cars are being cared for in the shop at Fiftieth Street and Sixth Avenue. Some of the cars are also being handled at Ninety-sixth Street and First Avenue.

In general the rehabilitation includes the removal and replacement of motors from trucks of the changing fields, armatures, gears, pinions, controllers and resistances (many of the old ribbon type), etc. The double-truck cars with maximum traction trucks are being furnished with a new inside brake rigging which will materially improve the braking conditions. A large number of Schoen steel wheels are being installed as drivers on the maximum traction trucks.

WIRING PRACTICE

A very important feature of this work is the complete re-wiring of all the cars, and in the case of the single-truck cars this is being done in a thoroughly satisfactory manner without using conduit except for the motor leads. In carrying out the re-wiring the cables are thoroughly overhauled and all the taps examined and made practically new. The under portion of every car body is cleared off and $\frac{1}{4}$ -in. asbestos board installed in all places exposed to arcing; namely, over the motors, plows and resistances. The cables are cleated to the truss planks in the interior of the car and are raised above the floor, where they are protected from moisture.

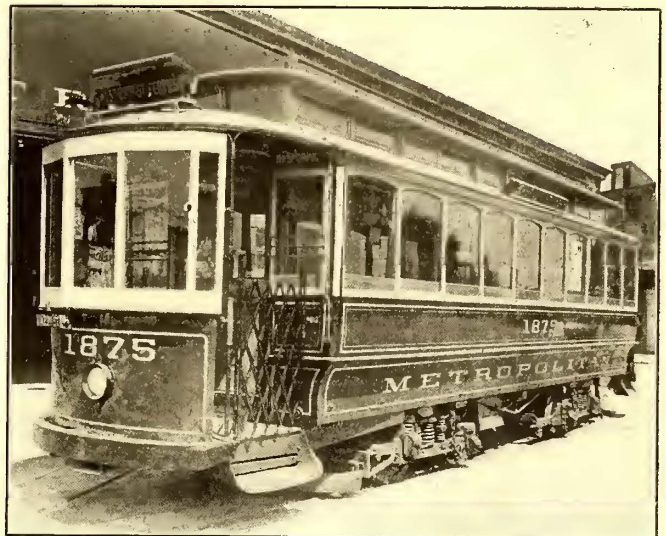
The re-wiring of the double-truck cars is being done according to what the company terms the semi-conduit method, that is, wherever possible the wires are run in conduit on the under part of the car floor to protect the cables and leads from mechanical injury and exposure to moisture. The cables are run in cable boxes in the interior of the car. All of this new work on the double-truck cars is in accordance with the specifications given on page 504, as

approved by the New York Board of Fire Underwriters and the Underwriters' Electrical Inspection Bureau.

The new cables used for this work are made up in long lengths of six or seven conductors to the cable. The wires are rubber-covered, single-braided, twisted, then covered with waterproof tape and a cotton braid. These cables when cut to the desired length are run in the cable boxes and conduit, after which the taps are made for the motors and resistances. This method is necessary, as the conduit crosses the middle of the car and the motor and resistance leads are tapped from the cable on each side of this center conduit.

The old Bishop cables removed from the long double-truck cars originally were wires bunched together and drawn through a canvas hose. These cables are sent to their manufacturer, who first examines the wires for mechanical injuries. The good wires are stranded in six- or seven-conductor cables, as required, and covered with a tape and braid, so when completed they are as serviceable as the new cables.

In assembling the old cables in this manner it is necessary to twist the wires around themselves and thus the cables are shortened enough to prevent their use on the double-



Metropolitan Street Railway Company—Car Painted Green with Aluminum Striping and Lettering

truck cars. They are therefore employed on the single-truck equipments. The fact that the wires could be used over again for exacting requirements after six to seven years' service is considered good evidence of the quality of the original material.

PAINTING PRACTICE.

After a careful study of the colors that have been standard upon the Metropolitan system for some years, it was found that the use of chrome yellow necessitated repainting every three or four years on account of the darkening of the color caused by the aging of the varnish. It was therefore decided that hereafter all cars as they go into the paint shop are to have the main panels painted green, using a cream upon the side posts and up to the green letter board, with the lettering and striping in aluminum. This change was decided upon by Messrs. Joline and Robinson, receivers, and Oren Root, general manager, who believe that under the new conditions it will not be necessary to repaint the cars until they have had from 8 to 10 years' service.

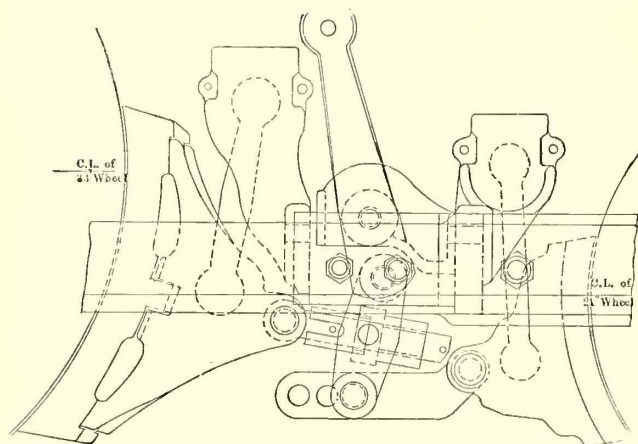
CHANGES AT KINGSBRIDGE

The Kingsbridge car house, which has been used for

storage only during the last seven or eight years. is undergoing some important changes to permit its use as a shop. The building is located on a heavy grade, the lower floor being a basement at one end. The lower floor is being equipped as a truck shop and now has, in addition to Quincy-Manchester cranes with hand-chain hoists, four pneumatic hoists.

The upper floor is divided into a paint shop, carpenter shop, smithy and machine shop. Owing to the fact that a large part of the track on the upper floor is elevated 4 ft. above the main floor on trestles, scaffolding has been installed for the car painting. The blacksmith shop is completely isolated from the rest of the floor by three walls of hollow brick and one of galvanized iron; its equipment will embrace six forges. The machine shop now includes three drills, lathe, shaper, bolt cutter, circular saw, band saw, a grinder and minor tools, and there will soon be added further presses, lathes, bolt cutters, shapers, saws, etc., which will be taken from First Avenue and Ninety-sixth Street to concentrate the work at Kingsbridge.

Among the other equipment installed at Kingsbridge are



New York Car Rehabilitation—Inside-Hung Brake Rigging for Maximum Traction Truck

a transfer table, Christensen compressor plant and a five-ton Quincy-Manchester traveling crane for lifting car body ends.

All of these improvements in the cars and shops are being made under the direction of H. H. Adams, superintendent of rolling stock and shops.

WIRING SPECIFICATIONS FOR NEW CLOSED CARS

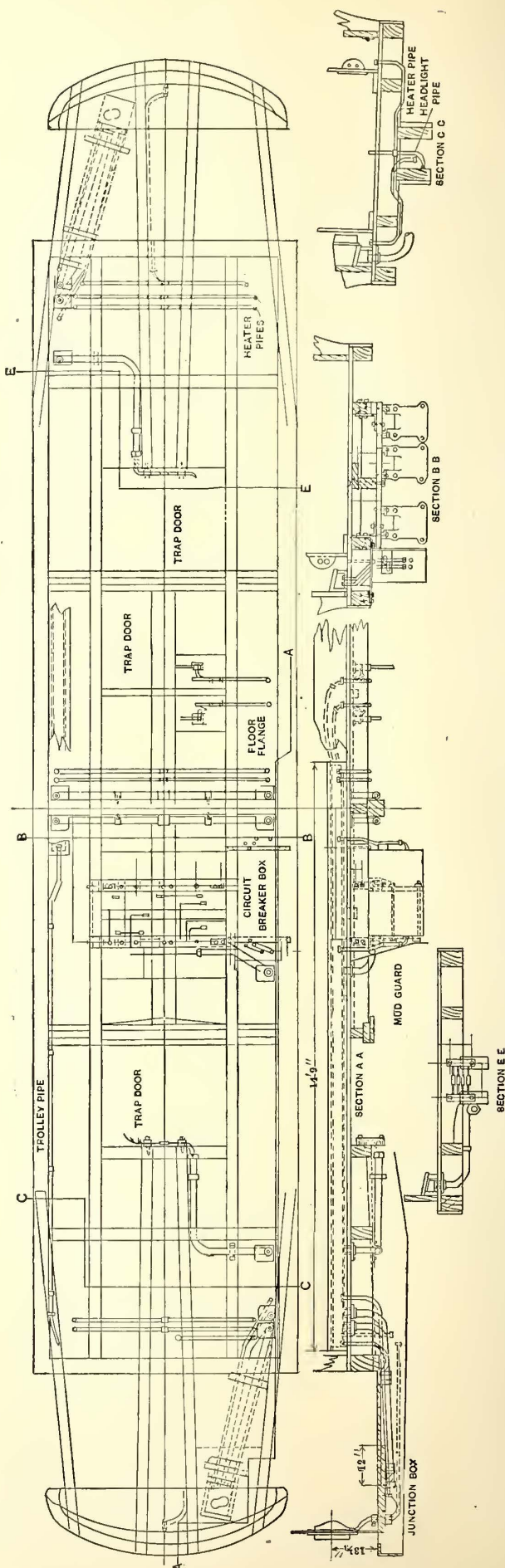
1. Roof or Trolley Circuit:

Flat wooden molding securely fastened to the side roof of car, and grooved on the bottom side to allow water to pass under same. It is to run 6 in. below the last iron carline on each end of car.

The roof or trolley wire is to be securely fastened to this molding with brass cleats and screws; cleats not to be over 8 in. apart. These wires to continue on hood-roof to a point located for hood-switch, and then through hood-roof to hood-switch, which is located on a wooden board under hood-roof and within easy reach of motorman. The wire from this point should continue on hood-roof to corner-post of car, down corner-post to its proper connection. This conductor is to be stranded and protected by an additional flame-proof braid. Conductors, where passing through roof or hood of car, must be protected to prevent ingress of moisture, by securely patching same with canvas, the underside of which should be thoroughly covered with white lead.

2. Light Wiring:

Light wires to run in wooden moldings, and must be so constructed as to thoroughly encase the wires and provide



Rehabilitation of New York Cars—Standard Wiring for Double-Track Cars

a thickness of not less than $\frac{3}{8}$ in. at the side and $\frac{1}{4}$ in. at the back of the conductors. The capping being not less than $\frac{3}{16}$ in. in thickness must have inside two coats of waterproof paint, and on the outside two coats of waterproof paint or varnish. The backing and capping should be secured in places by screws.

The conductors to be stranded and not less than No. 14 B. & S. gage, and protected by an additional flame-proof braid. Each outlet for fixtures or sockets must have a suitable blocking at least 2 in. in diameter larger than the receptacle to be secured to same. Cut-outs to be of the approved cartridge or approved blow-out type.

3. All switches controlling circuits of over 5 amp capacity shall be of approved single-pole, quick-break or approved magnetic blow-out type. Switches controlling circuits of 5 amp or less capacity may be of the approved single-pole, double-break, snap type.

4. Circuits must not be fused for over 15 per cent in excess of the normal load of the circuit. A cut-out or circuit-breaker must be placed as near as possible to the current collectors, so that the opening of the fuse or circuit-breaker in this cut-out or circuit-breaker will cut off all current from the car.

5. Care must be taken to clear all wires where they come down corner-post of the car, to protect them from mechanical injury from any moving part of the car, and not come in contact with any iron-work.

6. Cables, Cable Boxes and Conduit:

Cables or power circuit, where they are exposed under floor, to be run in approved, rigid, metal conduit, as per blue-print, or in two $1\frac{1}{2}$ approved, rigid, metal conduit, by connecting resistance-leads after cables are drawn into conduit.

Conduit must be continuous between, and be firmly secured into, all outlet or junction boxes and fittings, making a thorough mechanical and electrical connection between same.

On each side of the interior of car there shall be constructed a cable box, which shall be at least $3\frac{3}{8}$ in. x $3\frac{3}{8}$ in., lined with $\frac{1}{4}$ -in., approved, fire-resisting material, and with approved floor-bushings. Cables or power circuits, where they are exposed under floor, to be run in approved, rigid metal conduit ending off with approved bell-mouths.

7. Conduits, where they enter all outlet junction-boxes and end off above floor of car, must be provided with approved outlet bushings or bell-mouths, fitted so as to protect cables from abrasion.

8. All conduit must be permanently and effectively grounded.

9. All conduit, outlet, or junction boxes must be firmly and substantially fastened to framework of the car.

10. Where wires run to under side of car-body, the conduit to extend above the floor, and be provided with approved outlet-bushing or bell-mouth.

11. Conduit leading to motors and resistance to have a downward course so as to throw off moisture.

12. Conduit to motors should be brought to the pivoting point of truck to avoid motor-leads chafing on trucks.

13. Resistance:

Resistance to be placed in a convenient place in center of car, bolted to wood-strips $2\frac{1}{2}$ in. x 3 in. and secured to crossings by iron hangers not less than 6 in. from the floor or any woodwork of the car; the under and both sides of these wood-strips to be covered with $\frac{1}{4}$ -in. fire-resisting material. The wires from cable to resistance-boxes to have the insulation removed from the wires where they cross directly over the resistance boxes; and, when necessary, the ends of each wire to be wrapped with strands of wire to increase size to suit holes in connecting-lugs on resistance-boxes (this to secure good connections); all of this bare, stranded wire to be filled with solder, so as to make the wire rigid at this point. One-quarter-inch approved fire-resisting material to be placed over resistance-boxes and secured to the floor of car; thereby having an air-space between the current-carrying parts of this resistance-box and the fire-resisting material on the floor of car of at least 12 in.

14. Circuit-Breakers:

Circuit-breakers located at side under floor of car, with easy access so as to operate by hand quickly, if necessary;

and to be enclosed in wooden, water-tight box lined with $\frac{1}{4}$ -in. approved fire-resisting material, and so arranged that the arc deflector is exposed to the atmosphere and not confined in the box. Care should be taken that the arc deflector is not placed so the arc will come in contact with any of the woodwork of the car; there must be a clearance of all woodwork at least 6 in.

The conduit carrying the wires to the circuit-breakers should end off just outside of box, with approved outlet-bushings or bell-mouths.

15. Controllers:

Controllers must be mounted on at least $\frac{7}{8}$ -in. hard-wood block, covering the entire lower base of the controller (unless a cast-iron controller connecting-box is used).

A rubber and iron gasket to suit controller-base to be used to protect cables from moisture. Cables should also be protected where they leave conduit under platform and controller, by a water-tight wooden box lined with $\frac{1}{4}$ -in. approved fire-resisting material, or by a cast-iron controller connecting-box.

Cable wire connections on connecting-board in controller should be carefully made, and care taken that the ends of all wires are soldered and securely fastened by the set-screw, and a jam-nut, thus secured to avoid any loose contacts.

16. Sign-Lights:

Wiring for signs to be run in rigid metal conduit at each end of car on hood, with an approved outlet bushing or bell-mouth, and rigidly secured to hood and transom sash.

17. Headlights:

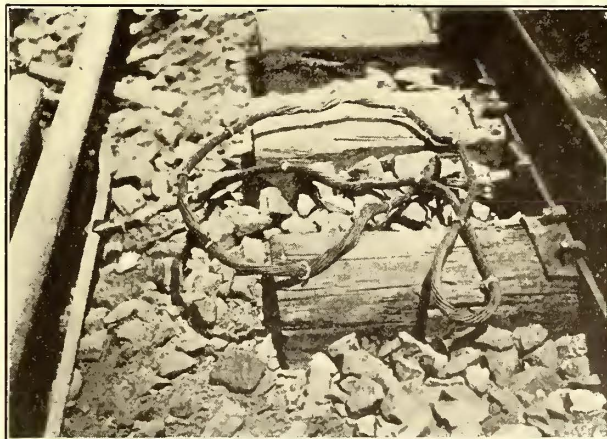
Wires, where they are exposed under floor of car, to run in rigid metal conduit to headlight in dasher at each end of car.

18. Heaters:

Heater wires to be run in approved wooden molding or conduit under seats, as per national code.

EMERGENCY SIGNAL RAIL BOND CONNECTOR

An application of the Dossert solderless connector, as used with the reactance bonds of the New York Central & Hudson River Railroad's signal service in the electric zone, is shown in the accompanying cut. The emergency connection consists of a 500,000 cir. mil cable tap to a



Solderless Connector for Inductance Bond

3000,000 cir. mil branch, which is always connected to the tap on one end and to a flat plate on the other; the plate in turn is bolted to a rail clamp. Should the signal service be interrupted in any way the cable tap is hooked onto the 500,000 cir. mil feeder running from the reactance bond and attached by the clamp on the other end of the cable to the rail. By this means, repairs, renewals or other interruptions in the signal system are cared for without impairing the service.

OPERATION OF THE CLEVELAND STREET RAILWAY SYSTEM BY A NEW COMPANY—V.

In spite of the favorable ordinance described in last week's issue of the *ELECTRIC RAILWAY JOURNAL*, and the unusual freedom from municipal restriction which has marked its enforcement, the operation of the Cleveland street railway system has been unsatisfactory from a financial point of view. The help of the city authorities, extended to the new management in many ways, has not prevented deficits.

While the valuation proceedings affecting the Cleveland Electric Railway Company were in progress, Mayor Johnson reiterated frequently that never before had a valuation of that character been conducted with representatives of a municipality bargaining on the one side, and officials of a corporation on the other. That attitude was characteristic of all that the city officials did concerning the old company while it retained control of the property. No repairs could be made in track without previous notice to the city and payment for the time of an inspector, who saw that the work was carried out in compliance with the understanding with the authorities.

The extent to which conditions have changed can be appreciated only when it is borne in mind that the principal city officials are now stockholders and directors in the corporation which operates the street railway.

DISAGREEMENT WITH TRAINMEN

Of all the events that have followed the assumption of control by the new corporation, the most spectacular and far-reaching was the treatment of the strike following the lease to the Municipal Traction Company. The old employees of the Cleveland Electric Railway Company had an agreement with it, its "successors, lessees, and assigns," made Dec. 22, 1906, one section of which provided that members of the employees' association in the employ of the company should be given free transportation over all lines owned and operated by the company. The new company made a rule that all employees should pay their fares.

The following section related to the wages of trainmen:

From the date of this contract until May, 1909, motor-men and conductors are to be paid by the hour on the following basis: For the first year of service, 21 cents per hour; for the second year of service, 23 cents per hour; for the third year of service and thereafter, 24 cents per hour. Provided, however, that if the Supreme Court of the United States decides in favor of the company in the Central Avenue case, now under consideration by the Court, the rate of wages is to be increased 1 cent per hour immediately after such favorable decision; and also provided that, in case the company at any time prior to May 1, 1909, enters into a general renewal of its grants with the city of Cleveland, the rate of wages will at once be established on the following basis: For the first year of service, 23 cents per hour; for the second year of service, 25 cents per hour, and for the third year of service and thereafter, 26 cents per hour.

After the passage of the renewal ordinance on April 27, 1908, the employees expected advances in wages in accordance with this provision. It was understood by the men that this agreement was included in the schedule of contracts, etc., covered by the terms of the lease of the Cleveland Railway by the Municipal Traction Company. The company claimed, however, that it had a contract with the employees of the Forest City Railway, the low-fare line started by Mayor Johnson, which it recognized in preference to that held by the Cleveland Electric Railway with its employees.

Whatever the moving provocation may have been, a strike occurred shortly after the new management took control.

Mr. du Pont stated to the representatives of the *ELECTRIC RAILWAY JOURNAL* that no strike on the lines of a street railway system had ever been contested so successfully as that with which he was confronted directly after the new company took control of the property.

The chief of police of the city assumed direct charge of the movement to quell disorder and maintain the service. As he guided personally the operations of the uniformed and special policemen it was not possible for secret sympathies of the police to influence their actions regarding the strikers.

With the influence of the city authorities opposed to a strike, it is easy to appreciate the truth of Mr. du Pont's statement that no other strike was ever managed as was the Cleveland walkout. The strike was ended quickly and the places of the strikers have been filled with men drawing lower wages. On account of the many men who are seeking employment, it was a simple matter to hire sufficient new trainmen to fill the vacant places.

DEFICITS FROM OPERATION

The tables on page 507 show the results of operation so far as figures are available. The May figures were affected of course by the strike, which caused a reduction in gross revenue and disorganization in the operating department, but as deficits have followed in the other months it is evident that operations have not reached a profitable basis.

The gross revenue from operation decreased 33.29 per cent in May, 1908, as compared with May, 1907; operating expenses decreased 14.86 per cent and net revenue from operation showed a reduction of 62.35 per cent. The number of car-miles was decreased in the same period 21.63 per cent.

It will be observed that the actual reduction in operating expenses was \$48,331, and that the decrease in expenditures for maintenance of way and structures and equipment was \$48,182. The expense on account of operation of the power plant was greater in the 1908 month than in May, 1907, but the cost of operation of the cars was less this year than last, on account of the reduction in car-mileage, which permitted a saving in platform expense. The total transportation cost was, however, reduced. The increase shown in the primary account, "superintendent of transportation," seems to bear out the statement that the new management has employed a much larger number of men to platform this service than the old company found necessary. It will also be noted that the old company charged \$4,000 on account of legal expenses, while the proportionate charge of the new management was slight.

It should be recalled that the figures for May, 1907, show the business of the Cleveland Electric Railway Company only; as they do not include the business of the Forest City Railway, which was combined with the Cleveland Electric Railway in May, 1908, the figures are to that extent misleading for comparative purposes. To the deficit of \$54,917 for May, shown in the detail figures presented herewith, a deficit of \$23,829 in June was added.

As the principal officials of the Municipal Traction Company are Mayor Johnson and A. B. du Pont, treasurer and president, respectively, the most important facts in their careers will be given.

CAREER OF MAYOR JOHNSON

Tom L. Johnson was born in Georgetown, Scott County, Ky., about 55 years ago. Some time before the war his father, A. W. Johnson, and family, removed to a plantation in Arkansas.

A. W. Johnson subsequently became a colonel in the Confederate army, and the family returned to Kentucky. After the war Colonel Johnson returned again to the Arkansas plantation, but finally settled again in Kentucky, near Louisville. Tom L. Johnson is said to have had no school education, having been taught by his mother, and acquiring the balance of his education through his own efforts. He is now a well educated man and speaks two or three languages besides English.

Mr. Johnson started his railway career as an office boy for the Central Passenger Railway Company of Louisville about 1872. This railway was controlled by Bidermann du Pont, the father of A. B. du Pont, and A. V. du Pont, an uncle of A. B. du Pont.

TABLE I.—INCOME ACCOUNT OF CLEVELAND RAILWAY FOR MAY, 1908, AS COMPARED WITH MAY, 1907.

May:	1907.	1908.	Increase.	Per cent.
Gross earnings from operation.	\$534,878.25	\$355,843.13	*\$179,035.12	33.29
Operating expenses.....	325,251.34	276,920.17	*48,331.17	14.86
Net earnings from operation.	\$209,626.91	\$78,922.96	*\$130,703.95	62.35
Miscellaneous income.....	138.69	537.13	398.44	....
Gross income, less oper. exp.	\$209,765.60	\$79,460.09	*\$130,305.51	....
Taxes	21,276.29	21,308.43	32.14	....
Income, less op. exp. and tax.	\$188,489.31	\$57,651.66	*\$130,837.65	....
Interest	39,991.67	39,190.40	*801.27	....
Net income.....	\$148,497.64	\$18,461.26	*\$130,036.38	....
Rental	73,378.00	73,378.00	....	....
Deficit .....	....	\$54,916.74	....	....

*Decrease. The figures for 1907 show the business of the Cleveland Electric Railway Company only; they do not include the business of the Forest City Railway Company.

TABLE III.—CAR-MILE EARNINGS, EXPENSES, ETC., OF THE CLEVELAND RAILWAY FOR MAY, 1908, AS COMPARED WITH MAY, 1907.

	Cents Per Car Mile.	
	May, 1907.	May, 1908
Car Earnings:		
Passengers	25.33	....
Chartered cars	23.37	....
Freight and express.....	31.94	....
Total car earnings.....	25.60	....
Miscellaneous earnings .....	.17	....
Gross earnings from operation.....	25.64	21.76
Operating expenses:		
Maintenance of way and structure.....	2.85	2.35
Maintenance of equipment.....	3.48	4.28
Total maintenance	6.33	5.13
Operation of power plant	1.38	2.18
Operation of cars	6.11	*7.93
Total transportation expenses.....	7.49	10.11
General expenses	1.77	1.70
Total operating expenses	15.50	16.94
Net earnings from operation	10.05	4.82
Miscellaneous income .....	.01	.03
Gross income less operating expenses	10.06	4.85
Taxes	1.02	1.33
Income less operating expenses and taxes.....	9.04	3.52
Interest	1.92	2.40
Net income	7.12	1.12
Rental .....	....	4.49

*Strike account included.
Car Miles.
May, 1907..... 2,086,212
May, 1908..... 1,634,838
Decrease

TABLE IV.—MONTHLY AND DAILY AVERAGE PASSENGER EARNINGS OF CLEVELAND RAILWAYS. In 1907 the Cleveland Electric Railway Company and the Municipal Traction Company operating the Forest City and Low Fare railways. In 1908 the Municipal Traction Company operating the Cleveland Railway.

	Passenger earnings—by months.			Passenger earnings per day.			Per cent increase.
	1907.	1908.	Increase.	1907.	1908.	Increase.	
January	\$394,774.99	\$458,080.66	\$63,305.67	\$12,734.68	\$14,776.80	\$2,042.12	16.04
February	361,511.11	434,827.32	73,316.21	12,911.11	14,994.05	2,082.94	16.13
March	412,077.50	469,676.34	57,598.84	13,202.82	15,150.85	1,958.03	13.98
April	474,326.12	450,239.47	*24,086.65	15,810.80	15,007.98	*802.82	*5.08
May	537,410.76	347,541.54	*189,869.22	17,333.89	11,211.02	*6,122.87	*35.33
June	533,450.51	399,778.36	*133,672.15	17,781.69	13,325.95	*4,455.74	*25.60
July	562,739.74	....	....	18,152.89	....	....	....
August	569,102.33	....	....	18,358.14	....	....	....
September.....	528,509.42	....	....	17,616.98	....	....	....
October	445,896.68	....	....	14,383.76	....	....	....
November.....	463,607.74	....	....	15,453.59	....	....	....
December.....	490,135.20	....	....	15,810.81	....	....	....
Total.....	\$5,773,542.10	....	....	\$15,817.92	....	....	....

*Decrease.

During his connection with this company Mr. Johnson invented the fare box which was used so generally before the present system of fare collection was established. Through various advances Mr. Johnson finally became secretary of the company, and about the same time his father was made superintendent. Shortly afterward Colonel Johnson was appointed chief of police of Louisville, and Tom L. Johnson became superintendent of the railway.

In promoting the sale of the fare box Mr. Johnson visited the city of Indianapolis. The Indianapolis railroad was controlled at that time by William H. English. Mr.

TABLE II.—OPERATING EXPENSES OF THE CLEVELAND RAILWAY FOR MAY, 1908, AS COMPARED WITH MAY, 1907.

May:	1907.	1908.
Maintenance—Way and Structures:		
Track and roadway.....	\$52,155.30	\$32,666.76
Electric line.....	5,215.53	4,087.10
Buildings and fixtures.....	2,086.21	1,634.84
Total	\$59,457.04	\$38,418.70
Maintenance—Equipment:		
Steam plant.....	\$13,492.96	\$8,174.19
Electric plant.....	6,746.48	4,087.09
Cars	26,077.65	16,348.38
Electric equipment of cars.....	20,862.12	12,261.28
Miscellaneous equipment.....	1,043.11	817.42
Miscellaneous shop expenses.....	2,086.21	1,634.84
Car rental.....	2,203.60	2,045.50
Total	\$72,512.13	\$45,368.70
Total maintenance.....	\$131,969.17	\$83,787.40
Transportation—Operation of Power Plant:		
Wages	\$7,359.77	\$11,300.27
Fuel	23,650.76	22,037.97
Water	835.31	715.10
Lubricants and waste.....	560.45	1,338.84
Miscellaneous supplies and expenses.....	577.95	1,024.79
Hired power.....	.34	....
Total	\$32,984.58	\$36,416.97
Credit from current and steam.....	4,148.06	747.39
Net total.....	\$28,836.52	\$35,669.58
Transportation—Operation of Cars:		
Superintendent of transportation.....	\$2,745.89	\$3,814.27
Wages of conductors.....	52,477.75	41,774.95
Wages of motormen.....	53,868.60	42,886.80
Wages of miscellaneous car service employees.....	3,828.31	4,092.51
Wages of car-house employees.....	8,424.86	8,513.27
Car service supplies.....	1,599.16	1,872.13
Miscellaneous car service expenses.....	1,865.64	5,651.22
Cleaning and sanding track.....	2,672.51	2,706.47
Removal of snow and ice.....	31.71	59.50
Total	\$127,534.43	\$111,371.12
Total transportation.....	\$156,370.95	\$147,040.70
General Expenses:		
Salaries of general officers.....	\$4,483.26	\$3,503.34
Salaries of clerks.....	2,856.53	3,075.18
Printing and stationery.....	742.90	863.49
Miscellaneous office expenses.....	357.47	513.08
Stores expenses.....	1,104.02	737.54
Advertising and attractions.....	....	76.95
Miscellaneous general expenses.....	4,065.62	4,283.32
Damages	15,593.71	11,443.87
Legal expenses—damages.....	2,000.00	14.65
Miscellaneous legal expenses.....	2,000.00	18.92
Rent of land and buildings.....	707.71	1,071.96
Rent of tracks and terminals.....	....	....
Insurance	3,000.00	2,224.73
Total general.....	\$36,911.22	\$27,827.03
Total operating expenses.....	\$325,251.34	\$258,655.13
On strike account.....	....	18,265.04
Total.....	\$325,251.34	\$276,920.17

Johnson observed that the Indianapolis system was in a run-down condition, but that the city was growing and that the railway property could be made profitable. He secured an option on the system, and interested the du Pont family and his uncle, Charles Johnson, who bought the property. Colonel Johnson was made president, and Tom L. Johnson treasurer, and the system was rehabilitated. This road was one of the first in the United States to introduce the universal transfer system. About this time Mr. Johnson became interested with A. B. du Pont and the Minarys of Louisville in the Southern Railway of St. Louis. This road was electrified, and after a long legal battle Mr. Johnson succeeded in getting a right over the Union Depot Company's tracks into the center of the city and sold control of the road to the Hamilton interests.

Later Mr. Johnson visited Cleveland and found a small line running from the West Side Market to Brooklyn Village, a distance of about four miles. This line was operated by mule-power, and was badly in need of rebuilding. The eastern end of the line connected with the tracks of the railroad controlled by the late Marcus A. Hanna. Mr. Johnson secured control of the property for a low price and this small line gave him his first foothold in the city of Cleveland.

Franchises were then secured by Mr. Johnson in the eastern part of the city and in the western section. He also asked for the right to operate his cars over the tracks owned by Mr. Hanna in the heart of the city, which would enable him to make a through line from the extreme eastern part of the city to the extreme western end. The plan to secure this latter right was fought bitterly for a period of two or three years, during which Mr. Johnson constructed his eastern and western lines and carried passengers in busses through the heart of the city between the disconnected ends of the roads. He finally won his contest, developing one of the best street railway systems of the city of Cleveland. This road is now a part of the Cleveland Railway system.

In the early 80s Mr. Johnson invented the girder rail. In the manufacture and sale of this rail and necessary special work, Mr. Johnson formed, with A. J. Moxham and A. V. du Pont, with whom he was connected in Louisville and Indianapolis, the Johnson Street Steel Rail Company, afterwards called the Johnson Company, of Johnstown, Pa. The company built the special work, having its girder rail manufactured by the Cambria Iron Company, of Johnstown. Later the Johnson Company built its own rolling mill, and in 1894 formed the Lorain Steel Company and moved its rolling mill to Lorain, Ohio, but still maintained the special work plant at Johnstown. Control of the Lorain Steel Company was sold afterwards to the Republic Iron & Steel Company. Mr. Johnson never held any office in either the Johnson Company or the Lorain Steel Company.

The flood in Johnstown had destroyed the street railway there and left the company nothing but the franchise. Mr. Johnson, with Mr. Moxham and A. V. du Pont, rebuilt the property and operated it. Some years later Mr. Johnson sold his interest to T. C. du Pont, and at present is said to have no interest in the property.

In 1887 or 1888 Mr. Johnson built a small cable road on Park avenue in Brooklyn, N. Y., called the Park Avenue Railroad Company. This was in opposition to the Atlantic Avenue Railroad, and was a comparatively small enterprise. It was finally acquired by the Atlantic Avenue Railroad and later reverted to Mr. Johnson through the lease of the Atlantic Avenue Railroad Company to the Nassau Railroad Company.

About 1893 Mr. Johnson became associated with his

brother, Albert L. Johnson, now dead, and R. T. Wilson & Company in the Nassau Railroad in Brooklyn. Tom L. Johnson finally became the treasurer, Albert L. Johnson being its president. After much franchise litigation and other troubles this road was finally put in operation, and later absorbed the Atlantic Avenue Railroad Company. With the exception of the Smith Street lines and the steam railroad lines, this combined Nassau and Atlantic Avenue system controlled the Coney Island business. The road was finally absorbed by the Brooklyn Heights Railroad Company, which now operates it.

About 1895 R. T. Wilson & Company, of New York, and Mr. Johnson became interested in what is now a part of the Detroit (Mich.) United Railway. An opposition railroad in Detroit, controlled by Henry A. Everett, of Cleveland, was being built or operated. Much opposition developed on the part of Governor Pingree of Michigan, as well as the citizens of Detroit, to the road which Messrs. Wilson and Johnson controlled, and a long and hard contest ensued, but it resulted satisfactorily to Mr. Johnson's company. Both roads are operated now by the Detroit United Railway. Mr. Johnson subsequently relinquished his interest in the Detroit system.

Mr. Johnson has been a representative for one or two terms from the Cuyahoga district of Cleveland. In his contest for election the influence of Marcus A. Hanna was arrayed against him, but not always successfully as his election proves.

CAREER OF PRESIDENT DU PONT

Alfred Bidermann du Pont was born in Louisville, Ky., about 44 years ago. He is a son of Bidermann du Pont, with whom Tom L. Johnson was associated in Louisville, and a nephew of A. V. du Pont, with whom Mr. Johnson was connected in the Louisville, Indianapolis and Johnstown railways, as well as in the Johnson Company.

Mr. du Pont is a graduate of the Massachusetts Institute of Technology, and is a mechanical and electrical engineer. After leaving the institute he became associated with the Louisville Railway Company, of which T. J. Minnary was and still is the president, although A. V. du Pont was at that time the dominating factor. A. B. du Pont was made chief engineer of this property, and secured there his first practical knowledge of electric railway practice.

During his term of office the Louisville Railways were electrified. Mr. du Pont remained in Louisville until 1894 or 1895, at which time Mr. Tom L. Johnson became interested in the Detroit property, Mr. du Pont going there as general manager and chief engineer. With Mr. Johnson he rebuilt the Detroit system and did a great deal toward developing the interurban lines in that section. The large platform cars were introduced in Detroit by him.

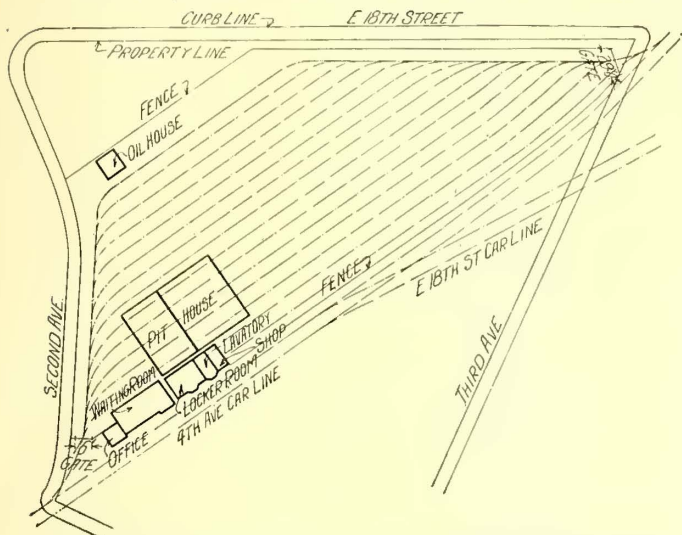
Mr. du Pont was, of course, in Detroit during the agitation over low fares there, which ended satisfactorily to the Detroit United Railway. Mr. du Pont remained in Detroit until 1900, when he went to St. Louis, remaining there about three years. He took charge shortly after the disastrous strike, constructed and completed the powerhouse, shops, etc., and put the system into condition to handle the heavy traffic at the time of the World's Fair in 1904.

Mr. du Pont left St. Louis early in 1904, and became associated with Mr. Johnson in the low fare roads in Cleveland. In addition to his operating ability Mr. du Pont is a fine engineer, a vigorous and hard worker. Besides introducing the wide platform cars, he is the inventor of the du Pont truck, as well as many other car, motor and truck appliances.

(To be continued.)

CENTRAL DIVISION STATION OF THE OAKLAND TRACTION COMPANY

The central division headquarters of the Oakland Traction Company, Oakland, Cal., furnish a good example of



Oakland Traction Company—Central Division Property
outdoor storage facilities. The weather of California is so mild that cars may be stored out of doors the year round. The pit house accommodates only 15 cars of the

TIPTON CAR HOUSE OF THE INDIANA UNION TRACTION COMPANY

The Indiana Union Traction Company has recently completed the new brick car house and division inspection and repair shop at Tipton, Ind., shown in the accompanying illustrations. Tipton is about the center of the Indianapolis-Logansport division and is the junction of this division with the Tipton-Alexandria line. The shop cares for light repairs and regular inspection of all the cars on the Tipton-Alexandria line and a few cars on the Indianapolis-Logansport division, as well as making running repairs to any crippled cars on the latter line. As Tipton is half way between terminals, the runs on the Indianapolis-Logansport division are arranged so that cars heading into Indianapolis make a round trip to Muncie before returning north to Logansport and most of the cars are regularly inspected and repaired at the division shop in Muncie where they are laid over between trips. At the present time only 11 cars are regularly inspected at Tipton, including five passenger cars, two motor freight cars, three work cars and one line car. Extra cars are stored in the car barn for emergency runs and excursion business.

The shop, inspection room and storage barn are under one roof and occupy a space 220 ft. x 70 ft. A 13-in. brick fire wall divides the shop and inspection room from the storage barn and a transverse wall further divides the east



Oakland Traction Company—View of Yards and Inspection Shed

150 cars ordinarily stored at this division center. Cars are run over the pits for ordinary inspection, cleaning and

bay into the inspection room 80 ft. x 30 ft. at the front end and the shop 138 ft. x 30 ft. in the rear. The two openings



Oakland Traction Company—Central Division Headquarters, with Yards and Inspection Shed

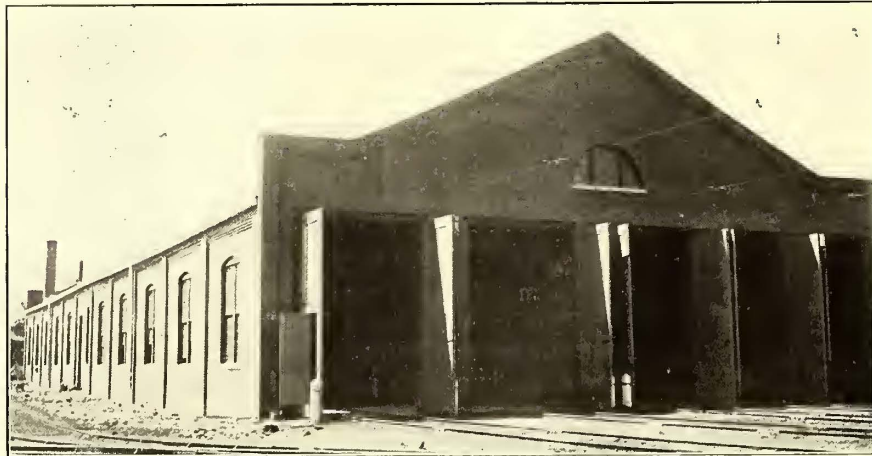
light repairs; for heavier work they are sent to the general repair shop.

in the longitudinal fire wall between the east and west bays are closed with metal sheathed sliding doors. The track

openings in the transverse wall between the inspection room and shop are closed with Kinnear rolling steel doors 11 ft. wide.

A pit 30 ft. long is provided in one of the two tracks in the inspection room for inspection and adjustment of brake rigging. The floor of this room is concrete and the other track can be used for washing car bodies. In the shop at the rear a truck pit 12 ft. long is built in the track next to the outside wall. This pit is served by a 2-ton hoist hung from a trolley carriage running on the flanges of an 8-in.

cars. The floor is of cinders. The roof of the building is of corrugated galvanized iron sheets supported by angle iron roof trusses spaced 20 ft. apart. The purlins are 3-in. x 3-in. angles trussed on the under side with 1/2-in. rods and two truss posts. No skylights are provided in the roof. In the west wall of the storage barn there are eleven 3-ft. 8-in. x 9-ft. single windows which provide sufficient light in the daytime. Twice this amount of light is provided in the east wall of the shop and inspection room by eleven 8-ft. x 9-ft. double windows. The north end of the building is



Tipton Car House and Shop of the Indiana Union Traction Company

closed by double paneled wooden doors swinging outward. The door posts are 9-in. I-beams supporting two 10-in. I-beam lintels. Wicket doors are built in two of the swinging doors as entrances to the inspection room and storage barn, respectively.

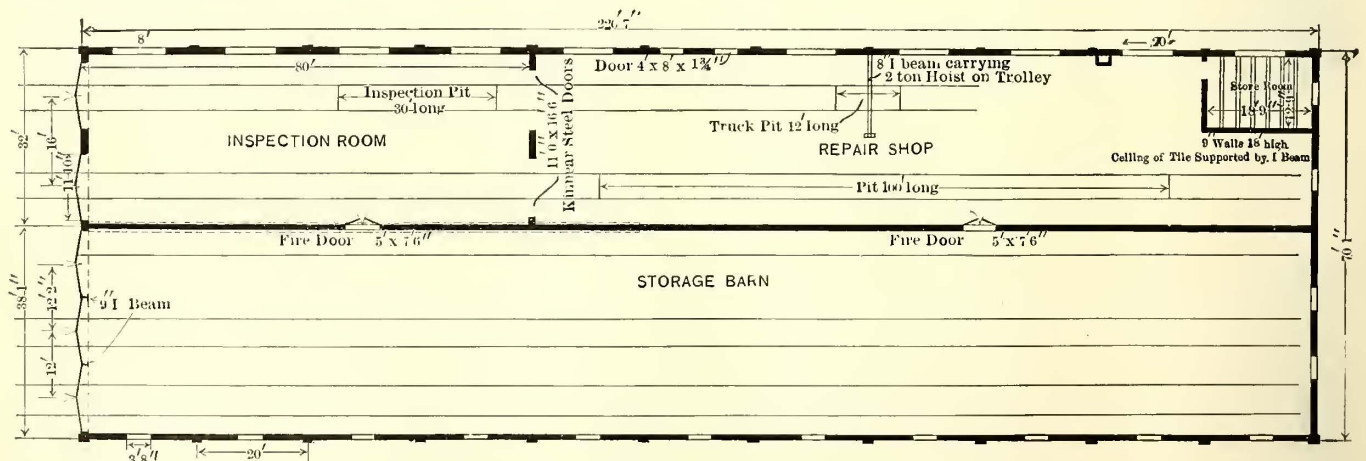
The storage house is illuminated at night only by cluster drops from the trolley wire. In the repair shop a row of incandescent lamps spaced 8 ft. apart and 6 ft. 6 in. above the floor is mounted on the partition wall along the work pit. A pair of bare wires are strung above the aisle between tracks and five-lamp cluster drops can be hung from these at any point. Other fixed lamps are provided over the work benches and in the store-

I-beam placed transversely across the center of the pit. This I-beam is set into the wall at its inner end and is supported at its outer end by an I-beam column placed in the aisle between tracks. With this hoist, motors can be opened for inspection, armatures removed and wheels changed by lifting the truck frame clear of the journal boxes and rolling the wheels out. The work pit next to the division wall is 100 ft. long. Hydraulic jacks are provided for raising car bodies off of the trucks. The shop is not supplied with machine tools to make any heavy repairs but

room. No lamps are mounted in any of the pits.

The building will be heated with hot water. Every precaution has been taken to prevent the spread of any small fire. In each half of the building 12 pairs of sand and water buckets are hung from brackets on the wall and in addition there are four hydrants with hose and nozzle attached ready for instant use.

A master mechanic and two helpers constitute the present day force and three men are employed on the night shift. When not engaged in making repairs to cars these



Plan of Tipton Car House of the Indiana Union Traction Company

two work benches, a hand blast forge and a full line of small tools are included in its equipment.

In the rear of the shop is a fireproof storeroom, 18 ft. 9 in. x 12 ft. 9 in., in which a general stock of car equipment repair parts is kept. The walls of this room are but 18 ft. high and do not extend up to the roof. The ceiling is formed of hollow tile arches supported by I-beams laid across the top of the walls.

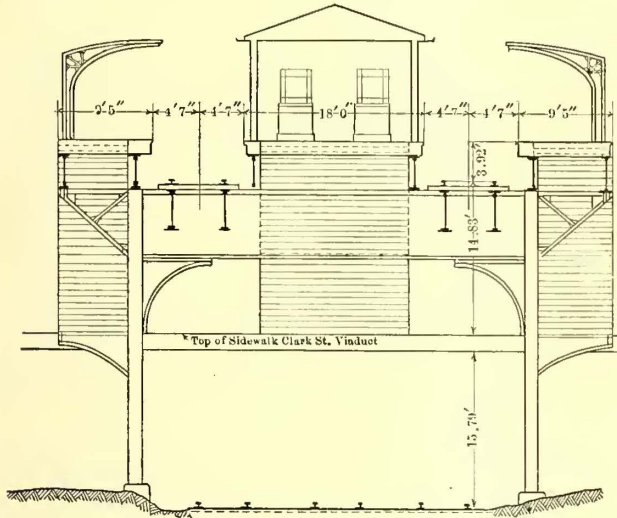
The car house in the west bay contains three tracks each 215 ft. long and has a storage capacity of 12 interurban

men are employed in winding field and armature coils and other light work which, when completed, is sent to the stock room of the main shop at Anderson for distribution.

The tunnels under the Hudson River, comprising the system of the Hudson & Manhattan Railroad will be completed and in operation by Jan. 1. On the Manhattan side the work will be finished within 90 days. The tunnel in Sixth Avenue, New York, is now completed up to Twenty-seventh Street. From that point to Thirty-third Street the excavation work will be done in a short time.

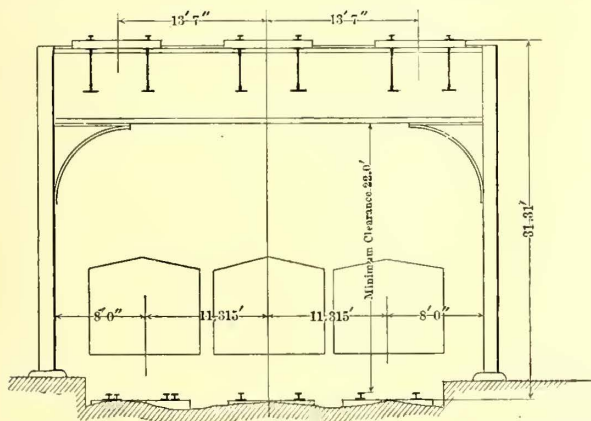
NEW TERMINAL STATION OF THE NORTHWESTERN ELEVATED RAILROAD

The Northwestern Elevated Railroad, Chicago, will begin at once the construction of a stub-end terminal to accommodate a portion of its passenger service. For some time the Union Elevated Loop, around which the Northwestern and other elevated roads in Chicago operate a large proportion of their trains, has been so overcrowded that it limited the service which could be given during the rush hours. As a means of relieving the loop structure of a portion of this traffic the South Side, Metropolitan and



Northwestern Elevated Railroad—Cross-Section Through Station

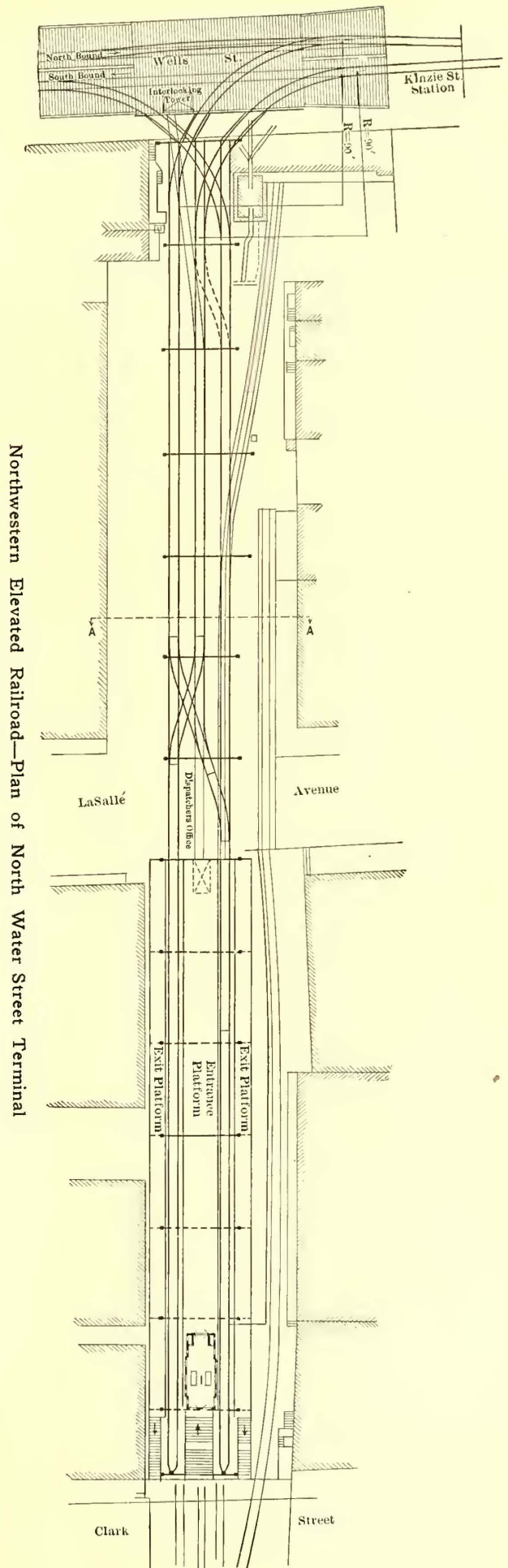
Chicago & Oak Park elevateds are now operating trains from stub-end terminals located just outside of the loop district. The Northwestern Elevated has been endeavoring for nearly a year to get permission to build such a terminal, and now that this has been granted, it will use every effort to hasten the construction of the new station. An



Northwestern Elevated Railroad—Cross-Section at A-A

accompanying illustration shows the track layout and arrangement of station platforms.

The new station will be located between Clark Street and La Salle Avenue directly over three freight tracks of the Chicago & Northwestern Railroad, which are parallel with North Water Street. The entrance and exits to the station will be broad stairways leading from the viaduct on Clark Street, now passing over these freight tracks. There will be two station tracks, one loading platform and two exit platforms. The entrance stairway leads to a waiting room provided with fare booths and turnstiles,



Northwestern Elevated Railroad—Plan of North Water Street Terminal

thence to a broad island platform from which passengers can load to trains on either side, as the case may be. The exit platforms are on the extreme edges of the structure. Thus, when a train enters the station passengers may be unloaded from one side of the cars and taken on at the other side simultaneously, either station track being used as desired.

The two station tracks, as they leave the platform, are to be connected with crossovers and an additional track built between so that there will be three connections with the main line on Wells Street. The connecting curves will turn an angle of 90 deg. with a 90-ft. radius. It is expected that an electro-pneumatic interlocking system will be installed with a tower at the "Y," where the stub terminal tracks connect with the present main line.

When this terminal is completed it will be possible to relieve the loop structure of 15 trains an hour. The proposed terminal will, it is thought, be in service by Dec. 1, 1908.

According to the terms of the ordinance the Northwestern Elevated Railroad agreed to operate funeral trains from the new terminal. At least one train must be operated each day running over the elevated lines to the several cemeteries north of the city and about 10 miles distant from the new terminal.

TURBINE TEST AT THE QUINCY POINT POWER STATION OF THE OLD COLONY STREET RAILWAY COMPANY

In the following paragraphs are given the results of an economy test made this year on one of the 2000-kw Curtis turbines at the Quincy Point power station of the Old Colony Street Railway Company by C. H. Bangs and S. F. Kedy, of the Massachusetts Institute of Technology. The object of the tests was to determine the economy of the turbine under regular commercial load, different constant loads and the relative increased efficiency due to high vacuum under commercial load. The commercial load was of 10 hours' duration; the water rheostat series at quarter, half, three-quarters load, load and one-quarter and load and one-half, or about 1 hr. and 30 min. duration each. The vacuum runs made at 26, 27, 27.5 and 28 in. were each of 2 hr. duration.

The rated capacity of the station is 10,000 kw, supplying three-phase, 25-cycle, alternating-current at 13,200 volts

equipped with two underfed mechanical stokers and attached superheaters, which deliver steam with 65 to 125 deg. Fahr. superheat at the turbines. Each unit is provided with a Wheeler surface condenser of about 8500 sq. ft. of cooling surface, a centrifugal circulating pump and an Edwards triplex air pump. All these pumps are motor driven excepting those connected with one turbine, which are steam driven. There are two accumulators and three duplex steam step-bearing pumps delivering water to the turbine step at about 600 lb. per square inch. All tests were made on one turbine, with motor-driven auxiliaries. This machine has 20 electrically operated valves, 10 on each side, and all 10 on one side must open before any on the other side come into action.

In preparation for the tests the air-pump discharge was broken and a riser put on which emptied into a barrel, the latter serving as a relay tank. The barrel was piped to two large steel tanks of about 6000 lb. capacity each, standing on scales. By means of quick-opening valves, each tank could be filled and weighed in turn. The tanks discharged into the sewer, near the plant. The step-bearing pump suction was cut off from the main line and tapped into the condenser discharge, thereby avoiding all corrections for step-bearing leakage. The accumulator was also cut off from the main line and directly connected to the turbine. The load output was measured by the two watt-meter method, with potential and current transformers placed in the line between the machine and the high-tension busbars. The field input in volts and amperes was measured. All instruments were calibrated before and after the test. As the load on the plant is for railway service only, it was necessary to use water rheostats for the constant load test. For this purpose five metal tank cars were used, lined with brick, with a capacity of about 400 kw each, and eight barrels with a capacity of about 200 kw each, or a total of about 3000 kw. The power generated was passed through the rotary converters to the d.c. bus of the station and was then delivered to the water rheostats by three cables of 1,000,000 circ. mil each. Leads were tapped from these cables to each car and barrel. The ground side of the rheostats was connected to the station ground. Water was supplied by special piping to each tank and barrel and all tanks and piping were grounded. No condenser leakage occurred in the tests. The condenser was opened up before the runs and all tubes tightened. The air-pump dis-

SUMMARY OF TESTS OF 2000-KW STEAM TURBINES AT QUINCY POINT POWER STATION OF OLD COLONY STREET RAILWAY COMPANY.

No.	Duration. Hr. Min.	Barom. Ins. Hg.	Stage pressures absolute.				Vacuum. In. of mer- cury (Hg.)	Steam.		Supht. °F.	Net load kw.	Lbs. steam per kw hr.	B. t. u. per min.	Thermal effic.
			1st.	2d.	3d.	Abs. in condnsr.		Press.	Temp. °F.					
1	1 30	29.98	15.82	4.61	1.44	1.29	27.36	190.2	449.8	72.3	492	25.49	494.4	0.115
2	1 35	30.09	27.91	7.98	2.01	0.72	28.60	183.2	435.4	61.0	1016	20.27	396.6	0.142
3	1 30	30.34	38.20	11.88	2.60	0.78	28.75	184.2	465.6	90.7	1510	19.38	384.2	0.148
4	1 30	30.08	44.40	15.51	3.33	0.57	28.92	182.0	436.0	62.1	2028	19.45	382.9	0.149
5	1 30	29.65	51.92	19.69	4.48	0.78	28.14	183.1	453.6	79.2	2506	19.35	381.9	0.149
6	1 10	29.59	51.92	19.78	4.56	0.73	28.10	183.5	450.4	75.8	2510	19.50	384.1	0.148
7	1 35	30.38	59.70	24.96	4.66	0.84	28.62	185.8	459.2	83.6	3030	19.68	388.0	0.147
8	2 0	30.26	40.44	14.27	3.02	2.07	26.05	181.5	430.6	56.9	1512	22.92	433.5	0.131
9	2 0	30.17	37.78	13.46	2.42	1.45	27.01	180.5	436.8	63.6	1421	21.58	414.7	0.137
10	2 0	30.0	40.25	14.20	2.85	1.22	27.52	181.2	436.8	60.1	1700	20.77	401.1	0.142
11	2 0	29.9	48.54	17.41	3.90	0.98	27.98	180.1	434.2	61.2	2196	20.15	391.2	0.145
12	10 0	29.95	41.35	14.53	3.19	0.58	28.76	178.6	436.6	64.3	1887	19.26	379.8	0.149+(.15)

to five substations located respectively at Rockland, Brockton, Bridgewater, Taunton and Fall River, where it is transformed into 600-volt direct-current for use on the company's railway system. The engine room contains five 2000-kw Curtis General Electric turbo-alternators of the revolving field type. The full load current of each generator is 87.5 amp. Steam is supplied to the turbines by eight Aultmann & Taylor and two Babcock & Wilcox boilers, which are piped to a common header. The boilers are

charge during the test was frequently tested with nitrate of silver to detect any leakage from the salt water used for cooling. In the table of results all figures of economy are expressed in terms of b.t.u. per kilowatt per minute to avoid correction factors. Tests 1 to 7, inclusive, were made under constant load and the balance of the tests under regular commercial loads. The best efficiency was obtained in test 12, the heat consumption being 32.9 b.t.u. per kilowatt minute. Tests 8 to 12 indicate that the in-

crease of efficiency due to raising the vacuum from 26 to 28 in. is 11.15 per cent, the corresponding b.t.u. per kilowatt minute being 434 and 391, respectively.

The results of the tests are given on page 512.

COMMUNICATIONS

HUNTING BUSINESS BY TROLLEY

FORT WAYNE & WABASH VALLEY TRACTION COMPANY.

FORT WAYNE, Ind., Aug. 11, 1908.

To the Editors:

The wholesale merchants of Fort Wayne recently undertook a three-day trolley excursion of 270 miles for the purpose of booming Fort Wayne as a wholesale center. About 65 wholesalers accompanied by a band and well supplied with descriptive pamphlets of their own advertising and a general book, containing information about the growth and opportunities of Fort Wayne as a commercial and manufacturing center, chartered two special interurban cars and made a trip to all the surrounding towns which could be reached by the interurban railroads centering here. The object of the trip was to give the wholesale dealers an opportunity to meet the retail dealers in the small towns. Heretofore only the traveling representatives of the wholesale houses had met and were personally acquainted with the retail dealers. The wholesale merchants believe that they are now in closer touch with the retailers in a personal way than ever before. The trip was an experimental one, but I understand that the wholesale merchants are highly pleased with the results and it is their intention later to visit by trolley every city and village within 100 miles of Fort Wayne. They expect to show the retail dealers the advantages of Fort Wayne as a wholesale center and especially the advantages of receiving quick delivery of merchandise via the interurban roads.

F. HARDY,

Interurban Superintendent.

THE QUESTION OF "REASONABLE RETURN"

ALBANY & HUDSON RAILROAD.

ALBANY, N. Y., Aug. 13, 1908.

To the Editors:

The expression is often attributed to the Interstate Commerce Commission, public service commissions, municipal authorities and other regulating bodies that railroads "are entitled to but a reasonable return upon the capital invested." What this "reasonable return" consists of is a question which remains unanswered by these authorities, and I am sure that the lack of expression on this point is a matter of great apprehension to prospective investors in railroad securities, and is of vital interest to railroads.

It is unnecessary to discuss at this time the great risk taken in the investment of capital in railroad projects, but it is very apparent that unless the promoters of these enterprises are allowed to receive a much more substantial return than can be obtained on mere bank deposits, money for railroading will not be forthcoming, and the best interests of the country will suffer. It is therefore of great interest to know at what point regulating bodies, either State or federal, are justified in stepping in and declaring the interest on capital invested to be in excess of that mysterious "reasonable return."

It may be that this matter has been generally discussed without the writer's knowledge in the railway publications, but if no such discussion has been held, it occurs to me it

would be a most interesting subject for you to take up editorially, or by publishing expressions on the subject from prominent railroad heads, and possibly from the State commissions themselves. It is probable that you will meet some difficulty in getting these people to express themselves, and in that event I am sure the subject treated editorially would be very interesting.

I am told that the old New York Railroad Commission at one time informally declared that in its opinion an 8 per cent return upon the capital invested was reasonable and adequate compensation. It appears to me that to establish any such low rate as this is to place a powerful deterrent on progress in the railroad field, which cannot but reflect injuriously upon the community. Assuming that an 8 per cent return was established as a maximum, there would be little or no incentive for railroads already earning such a return to improve their properties, increase the economy of operation, etc., if by this decree of the governing bodies the additional income would be wiped out by reduced rates of fare, etc.

I am greatly interested in this subject, and if you can direct me to any decisions or discussions pertaining thereto it will be greatly appreciated.

R. H. SMITH,

General Manager.

FENDER AND WHEEL GUARD TESTS

The Public Service Commission of New York, First District, has made public the details of the proposed fender and wheel guard tests to be conducted by it at Schenectady, N. Y., Sept. 15, and at Wilmerding, Pittsburg, Pa., Oct. 20, 1908. The notice is accompanied by a diagram of the car to be used in the tests and reads as follows:

CHARACTER OF TESTS

Generally, the tests will consist in picking up or removing from the track, three sizes and weights of dummies placed in various positions in front of the car, approaching them at two different speeds.

The fenders will be attached to both double- and single-truck cars. To conform with the street conditions within New York City, two different kinds of pavement will be imitated on the track roadbed.

The three dummies will represent, respectively, a man, a woman and a child. The first will be about 5 ft. 9 in. in height, and will weigh 170 lb.; the second about 5 ft. 3 in. in height, and weigh 120 lb.; and the third about 4 ft. 6 in. in height, and weigh 50 lb. The dummies will be placed on each type of pavement, not more than 30 ft. from the end of such pavement nearest the approaching car.

The two speeds at which the test will be made will be 6 and 15 miles per hour. The speed at which the car moves will be determined by a speedometer.

The portion of the track prepared for the test will be about 200 ft. long, consisting of 100 ft. to represent asphalt or macadam surface, and 100 ft. of cobble pavement.

The positions in which the dummies will be placed for the test are as follows:

Test No. 1.—Dummy placed in an upright position on the track, with its back toward the car.

Test No. 2.—Dummy placed in an upright position on the track, facing the car.

Test No. 3.—Dummy placed in an upright position on the track, with its side toward the car.

Test No. 4.—Dummy lying on the track, with its side toward the car (transversely).

Test No. 5.—Dummy lying on its side, with arms extended toward the car.

Test No. 6.—Dummy lying somewhat diagonally on the track, with its feet toward the car.

Test No. 7.—Dummy lying on its back with its head toward the car.

Test No. 8.—Dummy lying on its back with its feet toward the car.

Test No. 9.—Dummy lying along the rail, with its head and one arm extended toward the car.

Test No. 10.—After the fender or wheel-guard has passed satisfactorily all the tests made for the purpose of determining its life-saving qualities, it will then be subjected to a test to determine its ability to pass over obstacles or obstructions in the roadbed, by running it against boards or blocks spiked down in position.

Each projecting fender will be submitted to Tests Nos. 1, 2, 3, 5, 7 and 8, with all three dummies, over each type of roadbed and at both speeds, providing the tests are not discontinued as hereinafter prescribed.

Each underneath fender or wheel-guard will be submitted to Tests Nos. 4, 5, 6, 7, 8 and 9, with all three dummies, over each type of roadbed, and at both speeds, providing also the tests are not discontinued as hereinafter prescribed.

RULES GOVERNING TESTS

1. The entire conduct of the test will be under the direction of a sub-committee of the Public Service Commission for the First District, and only such directions as may be issued by the sub-committee will be recognized.

2. The testing ground will be roped off, and all disinterested parties will be excluded therefrom.

3. Each fender or wheel-guard submitted for test may be represented by not more than two accredited representatives, who must be named before the tests are begun.

4. The order in which devices will be tested will be determined by the sub-committee. Its decisions will be announced as far in advance as possible. A failure on the part of a competitor to be ready in his proper order may result in his being dropped from the competition.

5. A sufficient number of competitors will be notified to occupy the first three days of the test, directing such competitors to be on hand on the morning of the first day the tests begin. Other competitors will be notified by telegram a day in advance of the date upon which they will be called.

6. Fenders must be shipped by the manufacturers or inventors to themselves, care of "General Electric Company, Schenectady, N. Y.," or care of "Westinghouse Machine Company, Pittsburg, Pa.," with boxes or crates clearly marked "For fender tests." This commission will not be responsible for the receipt or for the care of any device.

7. For convenience, the tests on both fenders and wheel-guards will be divided into series. A complete set of four tests at one speed on each of the two types of pavement, with one size dummy (12 tests in all), will constitute a series.

8. If 50 per cent of the tests in any series on any fender or wheel-guard are not of Grade "A" as hereinafter defined, the tests on such fender or wheel-guard will immediately be discontinued.

9. The tests will be conducted in the following order:

- First Series.—Fifty-pound dummy at 15 m.p.h.
- Second Series.—Fifty-pound dummy at 6 m.p.h.
- Third Series.—One hundred and twenty-pound dummy at 15 m.p.h.
- Fourth Series.—One hundred and twenty-pound dummy at 6 m.p.h.
- Fifth Series.—One hundred and seventy-pound dummy at 15 m.p.h.
- Sixth Series.—One hundred and seventy-pound dummy at 6 m.p.h.

The first series of tests will be made with the devices attached to a double-truck car. A separate series will be conducted with a single-truck car, provided the former set is passed satisfactorily.

10. Only the predetermined number of tests will be permitted, except as provided in these rules. If a device does not pass satisfactorily a sufficient number of tests in any series, a protest may be filed and considered as provided in Rule 9.

11. If the ruling of the sub-committee is disputed at any point in a test, notice of a formal protest shall be given immediately; a formal protest shall be filed on the date of the test, setting forth all particulars, and a hearing shall be held and final ruling rendered in time to permit other tests to be made, if allowed by the sub-committee.

12. In an underneath fender or wheel-guard test, if the dummy is struck by the car and knocked entirely from the

roadbed (out of reach of the fender or wheel-guard), this will not be considered as a test, and the trial will be immediately repeated. The same ruling will apply in the case of a fender, if a similar occurrence takes place.

13. When the car comes to a standstill, the results of the test will be graded and recorded as follows:

A complete pick-up or removal from the track by either fender or wheel-guard, a test of Grade "A," counting four points.

If any part of the dummy remains under the fender or wheel-guard, but is partially picked up or removed from the track, a test of Grade "B," counting three points.

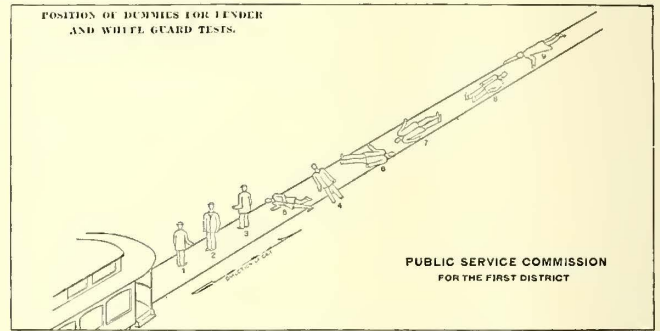
If the dummy is for the most part under the fender or wheel-guard, but still is partially picked up or removed from the track, a test of Grade "C," counting two points.

If the dummy is entirely under the fender or wheel-guard, but dragged sufficiently to prevent its going under the car or wheels, a test of Grade "D," counting one point.

If the dummy passes under the car or wheels, the test is a complete failure, Grade "E," counting 0 point.

RECORD OF TEST

Record of Test of Fender or Wheel-Guard No.
(This information is to be obtained by the representa-



Positions of Dummies for the Tests

tive of the commission at the testing ground preliminary to testing the device.)

Name
..... Fender
..... Wheel-Guard
Weight in pounds.....

Photograph of fender or wheel-guard, after the same is attached to car. No.

Type of car (double-truck or single-truck).....

Distance between the edge of fender or wheel-guard and car bumper: In front of bumper ft. in.; behind bumper ft. in.

Distance between the lowest point of fender or wheel-guard and top of rail: In normal running position in; when down in.

Vertical distance between the highest point of fender or wheel-guard and top of rail: In normal running position, ft. in.; when down on rail, ft. in.

Width of fender over all: Transversely, ft. in.; longitudinally, ft. in.

If the fender or wheel-guard is operated by automatic trip, determine the location of such trip with respect to the car bumper: In front of bumper, ft. in.; behind bumper, ft. in.

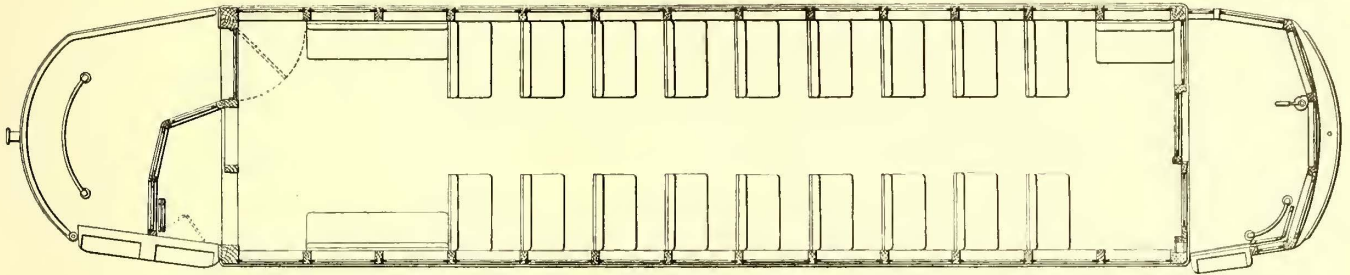
.....
Signature Inspector in Charge.

Many companies issue tickets as a convenience to their patrons even when these tickets are not sold at a reduced price. Some tickets are printed the same color on both sides, others are printed with one side of one color and the other side of a different color. At first thought this may appear to be a matter of indifference, yet those printed in two colors are a great convenience to the user because it is very much easier to distinguish a single ticket and avoid giving two tickets instead of one.

REBUILDING SINGLE-END CARS FOR PAY-AS-YOU-ENTER SERVICE IN ST. LOUIS

The United Railways Company of St. Louis is now rebuilding a large number of its car equipments so that the pay-as-you-enter method of fare collection may be used. The cars originally were built for single-end service and have long rear platforms and short front platforms. The

provided, one at the extreme left of the car and the other at the right, each opening being as near the corner post as the construction of the car body would permit. From the panel between these two door openings a partition extends toward the rear in a diagonal direction to form a part of a vestibule partition built across the rear platform from the middle to the step. This partition serves as an enclosure in which the conductor stands while collecting fares. Pas-



St. Louis Pay-as-You-Enter Car—General Plan

work of modifying these cars for pay-as-you-enter use comprises the rearrangement of the rear bulkhead and doors and the addition of a sliding door with a folding step at the front.

On the cars of this company smokers are permitted to ride on the rear platform which, on the type of car being reconstructed, is long and provided with a pipe railing. Because of the comparatively mild climate and the advantages of an open rear platform it was not considered advisable in reconstructing these cars for pay-as-you-enter

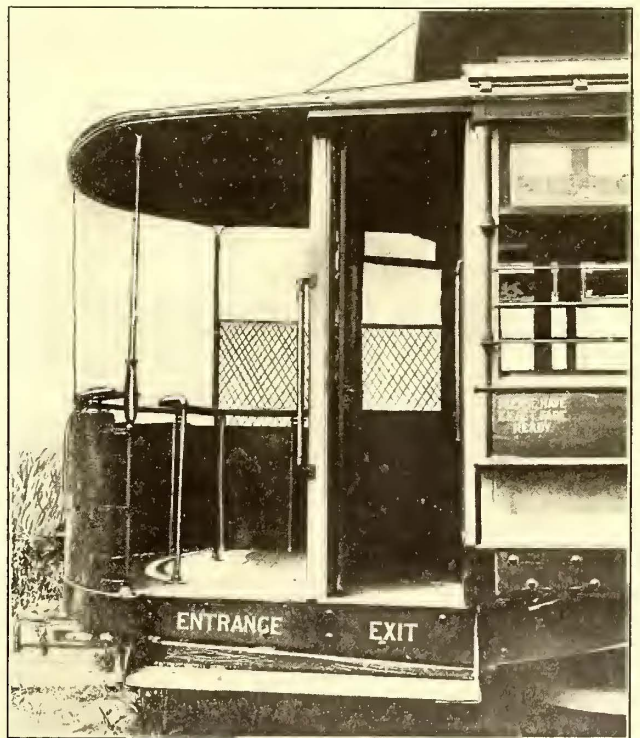
sengers will board the car at the rear of the supplementary partition, pass around and by the conductor, then into the car through the opening at the left side of the bulkhead. This entrance opening is closed by a door which slides into the middle panel of the end bulkhead. Passengers wishing to leave the car by the rear platform may step directly to the rear platform and thence by a single step to the ground. A folding door to be operated by the conductor serves to close the rear exit. This door is placed at the edge of the platform. By this arrangement of doors and supple-



St. Louis Pay-as-You-Enter Car—Front End with Door Closed and Step Raised

use, to build a vestibule entirely around the rear of the car. Such a vestibule would be of no practical use in the summer and would only be required for protection during a small portion of the year. It also would add materially to the dead weight on the platform supports. For these reasons a departure has been made from the more usual bulkhead arrangement for pay-as-you-enter cars.

In rearranging the rear bulkhead two openings were



St. Louis Pay-as-You-Enter Car—Rear Platform with Enclosing Vestibule

mentary vestibule the conductor is protected from the weather and stands in the same enclosure with the passengers. The supplementary bulkhead has three sash which are arranged with fastenings so that they may be raised or lowered to any desired height.

At the front of the car, as illustrated, a sliding door for exit only has been added. This front platform as originally built was so short that it was necessary to make the door

in two sections hinged together, so that they would operate on a curved door track. When the door opens the forward section is parallel with the right-hand front window of the front vestibule and close to it. A pipe railing serves to keep passengers from blocking the movement of this door, and one of the vertical parts of this railing serves as a grab-handle for passengers leaving the car by the front entrance.



St. Louis Pay-as-You-Enter Car—Door Operating Mechanism at Front End

This front door is operated by a train of levers controlled by a handle placed directly over the car controller, as shown in an accompanying engraving. The handle is long enough so that the opening and closing of the door will not be a difficult operation for the motorman to perform. A boss on the lower side of this door-operating handle rides on a horizontal sector plate properly notched, so that when the door is closed it is automatically locked by the boss engaging in a notch on the plate. This door-operating mechanism also controls a folding step beneath the front exit door.

INSURANCE METHODS OF CHICAGO CITY RAILWAY

The Chicago City Railway Company has very largely reduced its insurance premiums by the erection of proper buildings and by careful inspection. This company has a superintendent of insurance who devotes his entire time to insurance matters, reporting direct to the president. As soon as the company makes any improvement which will remove a risk, the superintendent of insurance takes steps to have the premium rate adjusted. The insurance superintendent also handles the insurance matters for all new properties.

The insurance on the Chicago City Railway property is carried under a blanket form of policy. This policy has just been rewritten both as to values and rates, having become effective on June 30, 1908. By the provisions of the ordinance under which the Chicago City Railway property

is being rehabilitated, the value of any property destroyed or damaged by fire is to be estimated by the Board of Supervising Engineers, Chicago Traction, and the loss then made good by the railway company. For this reason it is necessary that the company have its property fully insured at all times. The ordinance dictates that the insurance premiums shall be paid out of the operating expenses, and as the city has an interest in the division of the earnings, it is equally interested with the company in reducing the amount of premiums paid to the minimum consistent with affording a proper protection for the company's property.

In a recent communication to Bion J. Arnold, chairman of the Board of Supervising Engineers, Chicago Traction, T. E. Mitten, president of the Chicago City Railway Company, presented a tabulation showing the increase in the amount of insurance carried during the last three years and a comparison of the rates and premiums paid. The amount of insurable value is \$9,775,000, which is carried at a new rate of 60 cents per \$100, resulting in a premium of \$58,658 per annum. In this connection it is interesting to note the good effect of fireproof construction and improved inspection of property as evidenced by the reduced premium rate. While the insurance premiums have advanced only 14 per cent in the last three years, the amount of insurance carried has increased 425 per cent. The rates, premiums and amounts of insurance carried during the past three years are as follows:

	Insurable property.	Insurance carried.	Rate.	Premium.
July, 1905.....	\$5,300,000	\$2,300,000	\$2.22	\$51,060
January, 1906.....	6,441,869	6,441,869	1.00	64,418
January, 1907.....	7,442,500	7,442,500	.82	60,864
October, 1907.....	9,660,000	9,660,000	.68	65,688
June, 1908.....	9,775,000	9,775,000	.60	58,650

Before July, 1905, the company carried its insurance on specifically described property at given locations, but during the past three years the insurance companies have been induced to issue a blanket form of insurance policy by which the full value of the destroyed property is recoverable, no matter in which building of the company it may be at the time of destruction.

In order to enable a proper appraisal of the risk for the purpose of determining the rate to be charged, an estimated percentage of liabilities in each location is prepared and made a part of the policies, the purpose being specifically printed thereon, however, as being "for information only."

The policy states that the maximum loss upon which recovery can be made "in and on one section of any building or in one division of any storage yard" shall not exceed 6½ per cent. This applied to the total insurance of \$9,775,000 equals \$635,375. It is stated that by reason of the segregation of the buildings the maximum loss which can occur with the car houses filled to their greatest capacity shows a value of \$400,000, thus making it practically impossible that the loss sustained shall ever exceed the amount that could be recovered under the policy.

It is proposed to add to the insurance carried from time to time as rapidly as new property is acquired, and also fix a proper rating for depreciation so that the insurance carried may correspondingly be reduced at intervals to keep pace with the depreciated value of the property.

During the past three years the insurance companies have sustained no loss through fire on this company's system. This has been brought about largely by the careful inspection and removal of fire risks. The superintendent of insurance of the Chicago City Railway maintains a rigid inspection of all insurable property and has the working forces organized for fire fighting.

AUTOMATIC BLOCK SIGNAL SYSTEM USED BY THE LEBANON (PA.) VALLEY STREET RAILWAY

The Lebanon Valley Street Railway has had in successful operation for several years an automatic block system and signal disks for single and double track roads, designed by Chas. H. Smith, superintendent of the company. The general arrangement of the principal parts of the system as installed at a turnout will be noted in the illustration

The operating mechanism is in the box located above and on the same pole as the disks. All the parts on the pole are connected by a pipe which contains the circuit wires brought in at the top. The contact makers which operate only in one direction are small in size and weigh only 5 lb. They are mounted on the overhead wire and are actuated by the trolley wheel. The setting and releasing contact makers are located opposite the pole just ahead of the pole carrying the signal box, thus giving the



Pole Carrying Signal Box and Disks

motorman ample time to see the operation of the signals.

This system requires two line wires, one for setting and the other for the lamp circuit. The latter contains two lamps connected in series, neither of which burns when the signals are not in operation. The lights are discernible at daytime even if the sun shines directly upon the lenses.

If when a car enters a block a green signal appears, the car can proceed. This indicates that the signal has been set, and the red or danger signal thrown against an approaching car at the other end of the block. However, should the red signal show first as the car is going into the block, the car must stop and back out, waiting until the approaching car has arrived and released the signal. Should a car pass through the overhead contact maker after the danger signal has been set by an approaching car, it will not interfere with the signals, since the circuit has been cut out automatically. No current flows through

the magnets except momentarily at the time of operation, and there is no arcing at contact points.

By using the necessary insulators, a portion of the trolley at both ends can be cut out, so that in case a motorman passes a danger signal and goes into the protected block, he would be without power and would have to wait for the arrival of the approaching car to close the circuit.

A vibrating bell arrangement on a battery circuit has been put in operation recently on one of this company's blocks. Should the lamp circuit be interrupted for some reason, a car upon entering a block and getting on an insulated rail, will close the circuit and thus cause the ringing of the bell on a nearby pole to indicate that a car is approaching. By using additional line wires connected to the mechanism, the entire system can be brought under observation at one place to show the movement of the cars in either direction in every section. This signal mechanism can also be employed for warnings at dangerous street crossings and is used for this purpose in Lebanon.

Mr. Smith is planning to show his system at the next annual convention of the American Street and Interurban Railway Association at Atlantic City.

PORTABLE FURNACE

The Rockwell Furnace Company, New York, makes a portable heater especially adapted to removing and replacing hardened centers in switches and crossovers, expanding cable slots that have become closed and warped and heating steel parts of cars and trucks for straightening, shrinking and expanding. One of the heaters is self-contained, but the other is operated in conjunction with



Portable Burner in Service

compressed air which atomizes the crude or pure oil. The heaters can be readily moved to the seat of the work and one or two burners coupled to them, and the flame trained direct on the track or other work under way. An advantage of the compressed air type is that they do not have to be warmed before starting. It is only necessary to open the oil and air valves and ignite with a piece of oil waste. The average oil consumption of this type is about 2 gal. per hour, but varies, of course, according to the amount of heat required. The self-contained type is for kerosene oil only and consumes about 2 gal. per hour. A hand pump on the tank is used for charging the tank with oil and for obtaining the air pressure of about 25 pounds. As the air expands only in proportion to the amount of oil consumed, the pump requires little attention. Twelve and one-half feet of armored hose are supplied with each burner.

News of Electric Railways

The New York, New Haven & Hartford Plans Subway for New York

Charles S. Mellen, president of the New York, New Haven & Hartford Railroad, testifying on July 12 before the Public Service Commission of the First District of New York, intimated very clearly that it is the intention of his company to build and operate a rapid transit subway down the east side of New York if it cannot make arrangements to carry its suburban passengers through to the lower part of the city without change by other means. Mr. Mellen's testimony was given at the adjourned hearing called to ascertain why the New York & Port Chester Railroad Company had not proceeded with the construction of the line for which it obtained a franchise, in compliance with the terms of its contract with the city. Franchises were granted to the Port Chester and also to the New York, Westchester & Boston Company several years ago for parallel high-speed electric railways from a connection with the New York subway to Port Chester, and both companies have passed into the control of the New York, New Haven & Hartford Railroad through the Millbrook Company, a holding concern. Since the New York, New Haven & Hartford Railroad came into control of the properties they have been tied up by litigation. At the hearing President Mellen explained that if the Westchester franchise was declared valid the company would construct that road, but that if it should be declared invalid, the Port Chester line would be built. The witness said he wanted to make it plain that the New York, New Haven & Hartford Railroad had never intended to build both roads. The following summary was furnished through President Mellen of the expenditures by the Millbrook Company and the New York & Port Chester Company:

Expenditures by Millbrook Company for real estate in New York City since Nov. 1, 1906, for account of Westchester and Port Chester Companies:

Westchester Company	\$13,692
Port Chester Company	778,948
Total	\$792,640

Expenditures by Millbrook Company for real estate in Westchester County since Nov. 1, 1906, for account of Westchester and Port Chester Companies:

Westchester Company	\$140,480
Port Chester Company	\$541,405
Total	\$631,885

In addition mortgages remaining as follows:

Westchester Company	\$130,850
Port Chester Company	118,050

Total	\$248,900
Expenditures New York City as above.....	792,640
Westchester County	681,885

Grand total

	\$1,474,525
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Pay-as-You-Enter Conductors Arrested for Stealing in Newark, N. J.

Two conductors on pay-as-you-enter cars of the Public Service Corporation in Newark were placed under arrest on Aug. 13, charged with larceny. Both men were held in \$300 bail for action by the grand jury. Shortly after the Public Service Corporation put into use a number of the pay-as-you-enter type of cars, it began a thorough investigation as to whether it was receiving all of the fares collected. The agency of P. Edward Wisch carried on the inquiry. After about two weeks' work the arrest of these two men was made and evidence is being prepared on which a large number of indictments against other employees can be drawn. The investigation has not been confined to Newark alone, but has covered or will cover all of the other cities in New Jersey in which the Public Service Corporation operates cars.

The pay-as-you-enter cars in Newark are equipped with fare boxes on the rear platform, into which the passengers are instructed to drop their fare. The conductor is required to return full change when coins of large denomination are tendered and is not allowed to drop fares into the box. All fares, including transfers, are registered on one

register. The common method employed by the indicted conductors was to return short change to passengers and pocket the nickel which the passenger should have dropped in the fare box. These fares were usually properly registered, but the conductor would justify his register and fare box receipts by failing to register the required number of passengers when taking on a large crowd at the center of the city on his outward trip. Passengers in some few cases were observed to place a fare on top of the fare box without dropping it into the slot and the conductor would put it into his own pocket. The Public Service Corporation is determined to prosecute these two cases vigorously and to break up any possible alliance between dishonest conductors and passengers.

Outing of the New England Street Railway Club

The outing of the New England Street Railway Club is to be held at Norumbega Park, at Auburndale-on-the-Charles, on Tuesday, Aug. 28. This occasion will be a ladies' day, and special arrangements have been made for the entertainment of the members and the ladies. There will be a trolley ride, theater party and dinner, and the park attractions will be open to those attending the outing. Through the courtesy of the Boston Elevated Railway and the Newton Street Railway, members and lady guests will be taken in special cars from Park Square, Boston, at 4:30 p. m., 5 p. m. and 5:15 p. m. Through the courtesy of the Boston & Worcester Street Railway, members and guests will be taken in a special car leaving Worcester at 3 p. m., Whites Corners at 3:45 p. m., Wellesley Hills at 4:25 p. m. and arriving at the park at 5 p. m. Returning the cars will leave the park for Worcester at 9:45 p. m. The Boston & Northern Street Railway and the Old Colony Street Railway will also furnish free transportation to the park over their lines. Dinner will be served upon arrival at the park. Members' or ladies' tickets are 75 cents each and cover the entire entertainment, including the trolley ride, the theater, the dinner and the park attractions. It is requested that those who contemplate going on the outing address John J. Lane, the secretary, Boston, so that he can make suitable arrangements for the dinner and theater.

Straw Hats for Conductors.—The conductors of the Richmond Light & Railway Company are wearing as part of their uniform a straw hat with a leather visor. The hats are ventilated on top.

Universal Transfers in Brooklyn.—The *Brooklyn Daily Eagle*, which is conducting a campaign for prospective residents in that city, is advertising as follows: "Transfers all over town. No double fares to the homes here. Live in Brooklyn."

St. Louis Company No Longer Reports Passengers Carried.—The United Railways of St. Louis has ceased to report the number of passengers carried on its cars and the city will be unable to establish any claims for taxes on account of its lack of ability to show the earnings of the company. The question of the right of the city to impose a tax of 1 mill per passenger is now before the Supreme Court for a decision.

Colombian Street Railway Contract Forfeited.—The Municipal Council of Cartagena, Colombia, has declared the concession granted several years ago for the construction of a street railway in Cartagena and suburbs forfeited. This is done on the ground that the concessionaire has not complied with certain clauses of his contract, principal among them being the one requiring him to commence work within a certain period.

Portland Company Fast Restoring Cazadero Plant.—By the installation of two new generators at its power plant at Cazadero, the Portland (Ore.) Railway, Light & Power Company has restored two-thirds of the capacity of that plant which was entirely disabled by an accident on June 21. The first of the new generators was in operation July 10, while the second had been installed and ready for service July 31. The resumption of operations at the Cazadero plant has enabled the company to shut down its steam station at the Inman-Poulsen Company's plant.

Pennsylvania Officials Inspect New York Central Electric Zone.—A corps of engineers of the Pennsylvania Railroad and several members of the operating department of the company spent July 15 studying the electrical equipment of the New York Central & Hudson River Railroad in New York. The party was taken into the excavation between Forty-third and Fifty-sixth Streets and shown how the

upper and lower levels are being built to facilitate train service under the new system of electrical operation. Following this the power house at Highbridge was inspected.

Southern Company Reduces Wages.—The Newport News & Old Point Railway & Electric Company, the Citizens' Railway, Light & Power Company and the Hampton Roads Traction Company, all under the same management, have put into effect a general reduction in wages. It is said that the reduction amounts to about 2 cents an hour to trainmen. The conductors and motormen heretofore have been paid from 14 cents to 20 cents an hour. Under the new scale the pay will be from 12 cents to 18 cents an hour. The men work from 10 hours to 14 hours, so the reduction means an average of 25 cents a day.

Long Island Railroad After Reckless Autoists.—The Long Island Railroad is to station specially qualified men at crossings over which automobiles are accustomed to drive at reckless speed, who will measure a course, one-half of which will lie on each side of the tracks, over which all automobiles will be timed. The license numbers will be taken and special notations made of those going at unusual speed, and also of those who are duly cautious. The names of the registered owners of automobiles driven at dangerous speeds will be supplied to the newspapers in the hope of bringing home to the public the actual danger involved in this situation. The company recently made a private check upon the number of automobiles proceeding over crossings at reckless speed. The records show that of 310 automobiles passing over a crossing on the Merrick Road, which is protected regularly by a flagman, 121 crossed the tracks without any regard for the crossing signal or flagman. Several of this number barely escaped being crashed into by trains, and one man driving a car cursed the flagman for trying to stop him. One hundred and seventy-two slowed down, but did not stop, and 17 came to a full stop. Of the latter number, however, 11 were prevented from crossing by trains standing on the track.

Committee of Philadelphia Council Studying Fares and Operation.—The joint special committee of the Council of Philadelphia which has been studying in the West the question of fares and transfers in city railway operation, has returned to Philadelphia after visiting Pittsburg, Cincinnati, Milwaukee, Detroit, Cleveland and Buffalo, and within 10 days will visit New York, Brooklyn and Boston to study fares and transfers in those cities. The committee reports that in each of these places it was received courteously by the local management, placed in possession of the needed facts and extended every facility for studying the operation of the different lines. While in Milwaukee the committee considered the three kinds of fare in use there, the straight 5-cent fare, the six tickets for a quarter and the 25 tickets for \$1. It was also carefully noted that in that city the only tax on the company is 5 per cent of its gross earnings. The committee was not very well impressed with the operation of the Municipal Traction Company in Cleveland, and Mr. Costello, one of the committee, characterized the move in Cleveland as a purely political one. Members of the committee, however, were loath to talk for publication at this time. After its return from New York, Brooklyn and Boston the committee will report to the Council.

Chester Law and Order Society at Work.—The Law and Order Society of Chester, which was recently organized to suppress the disorder growing out of the strike of the employees of the Chester Traction Company and to put down the boycott incident to the strike, is actively at work. It now comprises 166 members and its chief business is the consideration of letters from persons who have been the victims of boycott. In stating its aims the society says: "It is distinctly understood that the work of this league has nothing to do with any differences that may exist between the Chester Traction Company and its former, now discharged employees, nor with any mistakes that may have been made in our city within the past four months. We shall deal simply with conditions as we find them to-day relative to people riding in the cars of the Chester Traction Company. During the struggle between the traction company and its former employees each side has lost heavily, but the loss to our business men in consequence of the trouble has many times doubled that of the company and the others interested. The league members, as a whole, feel, therefore, that the business interest of the city ought now to have a square deal. Many persons residing outside the city have expressed a desire recently to come to Chester to trade again if they can be assured they will not be molested in the use of the cars of the traction company, which is the only means of convenient conveyance for many of them. We invite that business to come to our city, and we shall make it our business, as a league, as far as possible, to arrest and punish any one known to disturb another for using the street cars."

Financial and Corporate

New York Stock and Money Markets

Aug. 19, 1908.

Following the active bull market in stocks shortly after the beginning of the month there came a sharp reaction and heavy selling pressure. Prices dropped even more rapidly than they advanced, although they did not drop quite so far. The reason was not hard to find. With general advances among the active issues of from 5 to 10 points, with every reasonable ground to expect a reaction, it is not surprising that traders gathered the fruit and trusted to getting in again at lower figures.

It has been a matter of wonder that the market should have been so persistently and steadily strong when the advancement in commercial and industrial lines was so tediously slow. It seemed hard to understand why railroad shares should advance when railroad reports were so distressingly poor; there seemed little reason for booms in industrials when factories were running at from 50 to 60 per cent of capacity and new orders were none too plentiful. On the other hand, the majority of the stocks that advanced were dividend payers, netting from 5 per cent up, and of course "they looked good" to investors when time money could be borrowed at 2½ and 3 per cent. But quick profits always mean sales and it was these profit taking sales that caused the reaction. There are likely to be other advances followed by other reactions, but the trend of the market is upward and each advance makes a new high record while no reaction swings as low as the one before it.

Nearly all the external conditions are favorable. The crop situation is satisfactory even if it does not signify that the yields per acre will be unusual, there are no financial troubles in any large corporations, money is plentiful and very cheap, politics is no longer a disturbing element. Active public buying will probably come in time. On the first three days of the third week of August the reaction seems to have spent itself and prices drifted about irregularly with trading very light. Money was quoted at 1@1¼ for call and 2½@2¾ for 90 days.

Other Markets

There was little doing in traction securities in the Boston market during the past week. Some blocks of Boston Elevated changed hands and prices were generally held stiff, the price at the close Aug. 18 being 135. Massachusetts Electric was stationary at 10 with few sales. The others were dealt in only for odd lots.

The weakness of Philadelphia Rapid Transit was one of the features of the week in the Philadelphia market. Trading in this issue was active and prices sagged until 13½ was the prevailing price. Other tractions were weak in sympathy and Philadelphia Traction and Union Traction were fractionally lower. At the close on Aug. 18 prices were a trifle firmer.

In Baltimore bonds continue to be the only traction securities that interest the public. United Railways 4s were fairly active with the prevailing price being about 87. The 5s were also dealt in to a limited extent.

Subway stock in Chicago was the chief traction that demanded any attention during the week. There were some transactions in this issue every day at prices around 21½. Metropolitan Elevated was picked up in broken lots at about 15. Other shares were quoted only nominally.

	Aug. 11.	Aug. 18.
American Railways Company, Philadelphia.....	46	45½
Boston Elevated Railway.....	132	135
Brooklyn Rapid Transit Company.....	55½	53
Chicago City Railway.....	a180	a180
Cleveland Railway.....	—	—
Consolidated Traction Company of New Jersey.....	a69½	a70
Consolidated Traction Company of New Jersey, 5 per cent bonds.....	a103½	a105
Detroit United Railway.....	a40	a42
Interborough-Metropolitan Company.....	13½	12¾
Interborough-Metropolitan Company (preferred).....	37¼	34¾
Manhattan Railway.....	139½	137
Massachusetts Electric Companies (common).....	10	10
Massachusetts Electric Companies (preferred).....	47	48
Metropolitan West Side Elevated Railway, Chicago (common).....	a15	a17
Metropolitan West Side Elevated Railway, Chicago (preferred).....	a46	a45
Metropolitan Street Railway.....	38	33
North American Company.....	64½	62½
Philadelphia Company, Pittsburg (common).....	38½	39
Philadelphia Company, Pittsburg (preferred).....	39¼	40
Philadelphia Rapid Transit Company.....	14½	13¾
Philadelphia Traction Company.....	88	*89
Public Service Corporation, 5 per cent collateral notes...	a97	a97
Public Service Corporation, certificates.....	a70¼	a70½
Twin City Rapid Transit Company, Minneapolis (common).....	a90¼	a90
Union Traction Company, Philadelphia.....	49¾	49

a Asked. * Last sale.

Report of the Illinois Traction Company for 1907

The pamphlet report of the Illinois Traction Company for the year ended Dec. 31, 1907, has recently been issued. It is very complete, covering the details of the various systems owned and operated. In all 25 traction and light companies are controlled. The company operates the street railways in Jacksonville, Granite City, Madison, Venice, Decatur, Bloomington, Peoria, Champaign, Urbana and Danville; the gas properties in Jacksonville, Decatur, Champaign, Urbana and Danville; the electric lighting and power properties in Jacksonville, Granite City, Madison, Venice, Edwardsville, Decatur, Bloomington, Champaign, Urbana, Danville and Westville, and the heating properties in Decatur, Bloomington, Champaign, Urbana and Danville. The report of the company shows a very substantial increase in earnings, attributed to the passenger receipts, although progress was made in the development of express and merchandise freight traffic. A contract was entered into with the United States Express Company by which the company transports the business of the express company for a period of two years, commencing April 1, 1908, under a consideration based on a percentage of the total volume of business done, together with a satisfactory guarantee covering a minimum compensation. The statement is made that the full benefits of the many improvements carried out by the company have not as yet been realized, because during the work of reconstruction much expense chargeable directly to operation has been entailed. The bulk of the reconstruction work was substantially completed before the present financial depression, but some of the obligations for which arrangements were made have had to be discharged during the period of depression. During the year the Legislature passed the 2-cent maximum passenger law, which became effective Jan. 1. While some apprehension was felt at first regarding the possible effect of the law on the earnings of the company, there has been no appreciable effect. The improvements to the property are summarized in a table prepared showing improvement expenditures for the entire system for the year. The totals of these expenditures for the different departments follow:

IMPROVEMENT EXPENDITURES OF ILLINOIS TRACTION COMPANY, 1907

Organization	\$9,834
Engineering superintendence	1,387
Real estate	7,352
Buildings and fixtures	109,308
Office furniture	313
Right of way	21,430
Track and roadway	263,773
Bridges and culverts	9,681
Overhead lines	87,044
Cars and equipment	302,934
Tools and machinery	692
Miscellaneous equipment	951
Steam plant	61,425
Electric plant	70,185
Substation equipment	9,840
Electric distributing system	76,820
Steam heat distributing system	13,684
Gas distributing system	46,880
Gas manufacturing apparatus	23,075
Miscellaneous	156,508
Total	\$1,273,119

On the development of express and freight traffic on interurban lines, the report says in part:

"The growth of the express and freight traffic of the Illinois Traction System was accentuated by the completion of the mileage necessary to effect direct connection between Peoria and St. Louis, and Champaign and Decatur. The lines of the Peoria, Bloomington & Champaign Traction Company and the St. Louis, Decatur & Champaign Railway were placed in operation early in 1907, while that of the Peoria, Lincoln & Springfield Traction Company, affording an air line from Lincoln to Mackinaw and reducing the mileage between Peoria and St. Louis, was opened to traffic as the year drew to a close. Largely to the augmented value afforded by these connections to the system's field of operations, the successful consummation of negotiations with the United States Express Company for the operation of its service, as previously mentioned, over the Illinois Traction system may be ascribed, and although it remains for the near future to effect connection at Danville with the extensive Indiana systems, the superiority as railway centers of the communities reached by the system in Illinois, coupled with the unsurpassed advantages of the St. Louis terminal, place it on a plane of comparative independence as regards connection with Eastern or other roads.

"The increased importance of express and freight busi-

ness has become more marked as the lines have multiplied. As generally understood express and freight revenues constitute the mainstay of railway earnings, and although in the history of interurban operation, perhaps in a great measure due to the prominence the advantages of its passenger service naturally assumed and the relatively short hauls of most interurbans, this portion of their business has been neglected, yet with the extensions of continuous mileage it must be assumed that the increased ratio of express and freight to passenger traffic will each year become more pronounced. Long-haul express and freight transportation is less susceptible to fluctuations in industrial fields than passenger traffic to changes in economic conditions, and the greater stability secured to the gross earnings of a transportation company is, of course, heightened with increased ramifications and enlarged mileage, in consequence of which the prospect for interchange at no late date with eastern lines, which with connections now penetrate uninterruptedly even to Pennsylvania, New York and Michigan, is gratifying.

"As suggested in the last report three essentials to the development of express and freight traffic are apparent. The first—that of a sufficient railway reaching freight and express consuming and distributing centers—obviously is nearer realization than at the end of the year 1906, though the imperative need for belt railways at Springfield, Decatur and Edwardsville has not as yet been met, and remains an obstacle to the successful expansion of the system's freight traffic, especially precluding the development of bulk freight business. Desirable terminals in the cities served by the system—the second requisite—are very generally enjoyed. The third requirement—adequate rolling stock equipment—has received due consideration during the year just passed. To the five electric locomotives in operation on the first day of January, 1907, there have been added five others, including pulling cars, while two engines are yet to come from the builders. Fifteen express motors and perhaps 44 express trailer cars are in operation, while the gondola and flat car equipment has been augmented to a maximum of 394 in commission, used, generally, in coal-carrying trade.

"The transportation of perishable commodities has been accommodated by the purchase of four refrigerator cars, and the increased scope of traffic operations thus enabled, with the pronounced favor with which the refrigerator service has been received, has more than justified the expectations of the management in its provision.

"With traffic interchange with the terminal steam railways at St. Louis and Peoria, which, while desirable, is not absolutely essential, and with the completion of belt lines at Springfield, Decatur and Edwardsville, as previously adverted to, it may conservatively be estimated that the following traffic movements yielding the revenues indicated would be possible:

Gross revenue from movement of coal mine now served by this line in Worden district to St. Louis market, per year	\$100,000
Gross revenue on movement of grain from points in central Illinois for delivery to Southern railroads, per year	200,000
Gross revenue from movement of lumber and other car-load commodities from St. Louis to points on the system's lines, per year	100,000
Gross revenue from movement of coal from Springfield district to Bloomington and Peoria markets, per year	75,000
Gross revenue from the movement of coal from the Springfield district to points east of Decatur, per year	25,000

in all aggregating a total of a half million dollars per year, from traffic which might be handled with few additional facilities. The revenue to be derived from the movement of Springfield district coal to Bloomington and Peoria, it may be explained, will accrue without expenditure for belt railways, but where bulk freight movements entail operation through the streets of Springfield, Decatur or Edwardsville, they cannot be undertaken not only because of franchise restrictions, but by reason also of short radius curves in the city streets.

"It may be concluded that although express and freight traffic, as heretofore, has been confined largely to movements of produce, meats, groceries and other articles of food consumption, in which department the pre-eminent value of the Interurban has daily been more fully appreciated, yet the field open for Interurban participation is concededly unlimited and promises abundant returns when properly entered and developed."

The method of operation of the properties was materially revised near the close of the year by the unification of the operating organization of the interurban lines and the concentration of the efforts of the general superintendents on local utility properties.

The comparative statement of earnings for the three years ending Dec. 31, 1907, follows:

Gross Earnings:	1907	1906	1905
Intercurban	\$1,610,257	\$1,008,135	\$611,981
Local street railway...	1,226,591	1,151,487	1,066,795
Gas	259,572	240,744	218,062
Electric light and power.	542,032	497,666	445,080
Steam heating	127,453	115,076	100,470
Miscellaneous	13,282	.....	.....
Total gross earnings.	\$3,779,187	\$3,013,108	\$2,442,388
Operating expenses ...	2,065,424	1,602,601	1,257,111
Taxes	63,064	48,555	37,539
Total operating ex- penses	\$2,128,487	\$1,651,155	\$1,294,651
Net earnings	\$1,650,699	\$1,361,952	\$1,147,737
Percentage of operating expenses	56.3	54.8	53.0

The balance sheet for the year ended Dec. 31, 1907, follows:

ASSETS AND LIABILITIES

ASSETS	
Stocks and securities.....	\$10,214,266
New construction for controlled companies.....	1,426,523
Balance of revenues due from controlled companies	163,075
Bonds retired for controlled companies.....	25,125
Accounts and notes receivable.....	183,495
Stores on hand	88,595
Cash in bank (current account).....	84,326
Cash in bank (accident fund).....	4,364
	\$12,189,769
LIABILITIES	
Capital stock, preferred.....	\$3,618,600
Capital stock, common.....	6,594,500
Accrued interest on bonds of controlled companies	208,413
Accounts and notes payable.....	466,985
Reserve on account of accident insurance.....	8,239
Surplus, 1906	\$829,916.78
Net profit, 1907.....	463,115.11
	1,293,032
	\$12,189,769

The operating statistics follow:

INTERURBAN LINES

Total number of passengers carried.....	8,182,069.00
Total number of car miles operated, including company freight	5,336,721.00
Number of miles fully operated during 1907....	269.00
Gross earnings per mile on fully operated track.	\$5,128.00
Number of miles partially operated during 1907.	117.00
Gross earnings per mile partially operated track.	\$1,971.00
Average fare per pay passenger.....	.1754
Gross earnings per revenue car mile.....	.3149
Passenger earnings per passenger car mile....	.3055
Express and freight earnings per express and freight car mile .....	.3313
Total expenses per car mile.....	.1734

CITY LINES

Total number of passengers carried.....	26,276,649.00
Total number of car miles operated.....	6,724,716.00
Gross earnings per mile of track.....	\$11,525.00
Average fare per pay passenger.....	.0466
Gross earnings per car mile.....	.182
Total expenses per car mile.....	.0976

Report of the New York City Railway Company

The first complete report of the operation of the New York City Railway Company under the receivers, Adrian H. Joline and Douglas Robinson, was made public Aug. 15 and covered the operation of the company during the period from Sept. 25, 1907, to June 30, 1908. This statement, which is published below, shows that the deficit from operation, not including the charges defaulted, amounts to \$1,047,682.38. In addition the receivers have spent during the period mentioned, for charges incident to the operation of the property, the sum of \$344,882.83. This sum has not been included in the statement, as it is a question whether it should be charged to the Metropolitan Street Railway Company or the New York City Railway Company. Including this in the operating expenses would bring the deficit to \$1,392,565.21. In addition expenditures have been made (not included in the above statement) on account of change of

motive power, additional power machinery, enlargement of car houses, installation of sprinkler systems in buildings, new cars, etc., amounting to \$943,874.44. Part of this was paid from the proceeds of receivers' certificates and part from other sources.

Owing to the fact that last year's report contained the results of operation from the Third Avenue Railroad Company, it is impossible to publish a comparison of the figures made public this week and those for last year. Presumably the earnings include those of the Third Avenue Railroad Company, while it was being operated by the New York City Railway Company, but as the rental for these lines was defaulted by the receivers of the Metropolitan Street Railway Company as soon as it became due, the net income is larger than it would otherwise be.

Statement of results of operation of the New York City Railway Company during the period from Sept. 25, 1907, to June 30, 1908:

GROSS EARNINGS	
Cash fares	\$11,497,007
Ticket fares	28,438
Mail	819
Express	20,883
Total	\$11,547,147
OPERATING EXPENSES	
Maintenance of way and structures..	\$929,013
Maintenance of equipment.....	1,912,254
Operation of power plant.....	899,432
Operation of cars.....	3,639,086
Injuries and damages—expended....	489,713
Injuries and damages—deferred....	686,264
General	708,076
Total	9,263,838
Net earnings.....	\$2,283,308
OTHER INCOME	
Advertising	\$178,108
Rental of land and buildings.....	109,092
Rental of tracks.....	11,110
Rental of equipment.....	8,712
Miscellaneous interest	222,016
Other income.....	4,744
Total	533,783
Gross income.....	\$2,817,091
DEDUCTIONS FROM INCOME	
Taxes—Other than special franchise.	\$607,424
Taxes—Special franchise—estimated on basis of assessment for year ended Dec. 31, 1907.....	599,813
Rent of leased lines on which permanent default has not been made...	2,156,727
Interest on funded debts of companies whose roads are operated under agreements on which permanent default has not been made.....	79,083
Interest on real estate mortgage....	36,417
Interest on floating debt.....	2,113
Claims against companies in hands of receivers.....	383,197
Total	\$3,864,773
Net income—Deficit, not including charges defaulted.....	\$1,047,682

Earnings of American Cities Railway & Light Company

The operating report of the American Cities Railway & Light Company for the six months ended June 30 shows how slightly the earnings of its constituent properties have been affected by the business depression. This corporation is a holding company and controls through ownership of over 85 per cent of stock of the Birmingham Railway, Light & Power Company, of Birmingham, Ala; the Little Rock Railway & Electric Company, of Little Rock, Ark.; the Memphis Street Railway Company, of Memphis, Tenn.; the Knoxville Railway & Light Company, of Knoxville, Tenn., and the Houston Lighting & Power Company, of Houston, Tex. The last is a lighting company only. The operations of all of these companies are supervised by Ford, Bacon & Davis, consulting engineers. The figures of the other five companies are shown in Table I.

The combined income account of the five companies

owned by the American Cities Railway & Light Company for the six months ended June 30, compared with the re-

operation and maintenance of power plants, \$4,000, leaving a net increase for six months of \$237,000. The discounts on

TABLE I.—SHOWING OPERATING STATISTICS OF PROPERTIES IN BIRMINGHAM, LITTLE ROCK, MEMPHIS AND KNOXVILLE OF AMERICAN CITIES RAILWAY & LIGHT COMPANY FOR SIX MONTHS ENDED JUNE 30, 1908 AND 1907.

	—Birmingham.—		—Little Rock.—		—Memphis.—		—Knoxville.—	
	1908.	1907.	1908.	1907.	1908.	1907.	1908.	1907.
Gross income.....	\$1,064,825	\$1,036,279	\$330,732	\$299,316	\$775,067	\$764,044	\$272,099	\$282,929
Operating expenses and taxes...	682,777	689,129	168,621	160,262	494,401	474,959	144,697	154,523
Net income.....	382,048	347,151	162,110	139,063	280,666	284,685	127,402	128,406
Fixed charges.....	263,295	228,208	58,000	50,330	208,439	198,164	68,677	62,192
Surplus	118,753	118,943	104,110	88,722	72,227	86,521	58,725	66,214
Increase in gross over 1907....	\$27,546 or 2.6 per cent.		\$15,388 or 5.2 per cent.		10,423 or 1.4 per cent.		(d) \$10,830 or 3.8 per cent.	

sults of the corresponding account of the previous fiscal year is shown in Table II.

TABLE II.—COMBINED INCOME ACCOUNT OF AMERICAN CITIES RAILWAY & LIGHT COMPANY FOR SIX MONTHS ENDED JUNE 30.

	1908.	1907.
Gross income.....	\$2,629,000	\$2,551,000
Operating expenses and taxes.....	1,585,000	1,571,000
Net earnings.....	\$1,044,000	\$980,000
Fixed charges.....	621,000	559,000
Surplus	\$423,000	\$421,000

This statement shows an increase of over 3 per cent in gross income and an increase of over 6½ per cent in net income. There has been practically no change in the miles of track operated by the companies.

Table III shows percentage increases and other statistical statements of the constituent companies for the period mentioned.

TABLE III.—STATISTICAL STATEMENT OF CONSTITUENT COMPANIES OF AMERICAN CITIES RAILWAY & LIGHT COMPANY, SIX MONTHS ENDED JUNE 30, 1908.

Whole Property:		
Per cent increase over previous year.	1908.	1907.
Gross earnings.....	3.04	15.10
Operating expenses.....	2.25	26.20
Per cent of gross		
Operating expenses.....	54.04	57.00
Taxes	6.23	4.60
Operating expenses and taxes.....	60.27	61.60
Gross income.....	39.73	38.40
Interest	23.13	21.60
Net income.....	16.60	16.80
Railway:		
Per cent increase over previous year		
Gross earnings.....	2.74	11.60
Operating expenses.....	1.03	23.00
Per cent of gross		
Operating expenses.....	59.11	59.60
Net earnings.....	40.89	40.40
Per car mile		
Earnings, cents.....	24.49	23.75
Expenses, cents.....	14.34	14.15
Net earnings, cents.....	10.15	9.60
Per car hour		
Earnings, dollars.....	2.132	2.106
Expenses, dollars.....	1.249	1.255
Net earnings, dollars.....	.883	.851
Earnings in cents per passenger including transfers..	4.02	3.99
Kw-hours per car mile.....	3.49	2.87
Speed, miles per hour.....	8.71	8.86

New Orleans Railways & Light Company's Report for Six Months

The New Orleans Railways & Light Company has issued the following comparative statement of income, including leased and controlled companies for the six months ended June 30, 1908:

	1908	1907
Gross earnings	\$3,054,535	\$3,066,155
Operating expenses	1,714,429	1,577,170
Net earnings	\$1,340,106	\$1,488,984
Fixed charges	991,521	972,286
Net income	\$348,584	\$516,697
Other deductions	27,144	28,275
Gross surplus	\$321,440	\$488,422
New Orleans Railways & Light Company—Dividends declared..	.....	250,000
Net surplus	*\$321,440	\$238,422
*Out of which is to be reserved for rehabilitation of tracks and of cars and their equipments...	23,337	.....

Hugh McCloskey, president of the company, says: "The increase in operating expenses is mainly due to the increase in the following: Maintenance of track and roadway, \$26,000; maintenance of cars and equipments, \$59,000; wages of conductors and motormen and other transportation employees, \$30,000; manufacture of gas (due to an increase of 52,600,000 cu. ft.), \$26,000; total, \$141,000. Decrease in

gas for the period above quoted was 5 cents per 1000 cu. ft. greater than for the same period the previous year, making the price per 1000 cu. ft., \$1.15, against \$1.20 last year. During the first six months 7,211,912 transfers were used, against 3,627,602 the same period last year, or an increase of 98.8 per cent."

Berkshire Street Railway, Pittsfield, Mass.—The Berkshire Street Railway has asked the consent of the Massachusetts Railroad Commission to issue \$80,000 of new capital stock, half of which is to provide for an extension on Elm Street, Pittsfield, and half for improvements upon the North Adams-Williamstown line.

Kansas Southern Electric Railway, Iola, Kan.—The Iola Electric Railway, which now operates a line between Iola and La Harpe, has been bought by the Kansas Southern Electric Railway Company, which will build an electric railway between this city and Pittsburg, Kan., touching all of the important cities.

Metropolitan Street Railway, New York.—A motion has been made by Matthew C. Fleming, counsel for William W. Ladd, receiver for the New York City Railway, asking that B. W. Whitridge, receiver of the Third Avenue Railway, reimburse the New York City Railway for supplies aggregating \$51,000. Mr. Whitridge had counter claims against the receiver of the New York City Railway and the Metropolitan Railway, besides those for the use and occupation of the Third Avenue tracks from September, 1907, until January, 1908, for repairs, cars, supplies, etc., amounting to \$1,012,000 and unpaid franchise taxes amounting to \$1,250,000.

Richmond & Chesapeake Railway, Richmond, Va.—This company has filed for record a mortgage for \$1,000,000 dated Nov. 1, 1907.

Roanoke (Va.) Railway & Electric Company.—It is announced that this company has purchased from W. P. Camp all the stock and bonds of the Roanoke Water Power Company.

Spartansburg Railway, Gas & Electric Company, Spartansburg, S. C.—This company has been purchased by Pittsburg, Pa., capitalists identified with the Electric Manufacturing & Power Company, and the system will be improved and extended.

Winnebago (Wis.) Traction Company.—Oliver C. Fuller, president; Fred C. Best, secretary, and Russell Smith, assistant secretary, of the Wisconsin Trust Company, Milwaukee, who purchased the property of the Winnebago Traction Company on Aug. 6, as noted in the ELECTRIC RAILWAY JOURNAL for Aug. 15, represent a reorganization committee. The sale price was \$950,000, of which amount \$125,000 was paid in cash and the balance in bonds of the old company. A new company is now being organized, which probably will be called the Wisconsin Electric Railway, and to it all of the property of the Winnebago Traction Company will be deeded. Immediately after the sale of the Winnebago Traction Company was confirmed by the court the purchasers took charge, relieving R. H. Hackett, the receiver, who has been president of the company. The property was then placed in charge of Clement C. Smith, Milwaukee, president of the Eastern Wisconsin Railway & Light Company, who represents the purchasers. Mr. Smith has appointed J. P. Pulliam, who has been superintendent of the Winnebago Traction Company, to continue in active charge of operation, retaining the present organization. While the details of the new organization have not been completed, it is probable that the Wisconsin Electric Railway will operate in harmony with the Eastern Wisconsin Railway & Light Company, of which Clement C. Smith is president, and it is expected that through service will be given between Fond du Lac and Neenah, a distance of about 33 miles, over the tracks of both companies, and that there will be certain other adjustments by which each company will make use of facilities at present controlled by the other. The actual consolidation of the two properties has not yet been decided upon.

Traffic and Transportation

The Question of Transfers in New York

The members of the Public Service Commission of the First District of New York supplemented their order of Aug. 11, commanding the Metropolitan Street Railway and the Central Park, North & East River Railroad to establish a "joint rate" within certain limits, with personal statements of their intention to do their utmost to effect a settlement which shall be equitable to all concerned. The Commission has not yet made public any intimation of its ideas of what the "joint rate" should be as it prefers the companies should first establish a rate. If complaints are then received by the Commission that the rate is too high it can proceed under the authority granted by Section 49 to establish a lower rate.

J. P. Kirlin, counsel for the Metropolitan Street Railway, although not for the receivers, attended the hearing on Aug. 11 in behalf of certain stockholders. He expressed his belief that neither of the companies involved was financially able to resume the issue of free transfers to the lines of the other, and outlined what might be the course of legal action on the part of the companies in case the Commission establishes a less rate than a remunerative one.

"In the first place," said Mr. Kirlin, "the original transfer law only stipulates that transfers shall be issued between companies owned by the same concern. Formerly, when the Fifty-ninth Street line was leased by the Metropolitan Street Railway this law, of course, had to be obeyed. But after the receivers had been operating the Metropolitan Street Railway for a few months, they found that the Fifty-ninth Street line was being run at a loss, solely for the benefit of transfer passengers. So they applied to Judge Lacombe, of the Federal Court, for permission to default on the lease. This they were instructed to do by Judge Lacombe.

"Nothing was said in the court order about transfers, although it has been customary for the newspapers, in referring to the matter, to assert that Judge Lacombe ordered the abandonment of the transfer system. He did no such thing. He had not the power. He merely told the receivers that they could abandon the operation of a leased road, which was a dead weight upon their shoulders.

"There is a strong doubt in my mind whether, in view of the order from a Federal Court permitting the receivers to cancel the lease of the Central Park, North & East River Railroad (or Belt Line), the Public Service Commission has any right to say that the road shall give or receive transfers, when doing so is certain to hurt it financially. In other words, I do not think that the Public Service Commission can say that a corporation shall injure its resources even for the public good, after the stand taken by the Federal Court.

"It is certain that the companies are unable to issue free transfers; for, if any profit could have been made from such a system, there would have been no cause for the abandonment of the lease by the Metropolitan. The same objection is to be cited against a special 3-cent fare. There isn't enough travel to warrant it. It ought not to be difficult to see that a road can't be operated successfully when it is carrying passengers who do not pay for the privilege of riding on its cars.

"That is precisely the position the Fifty-ninth Street line found itself in. To be sure, people say the number of passengers has fallen off since the abolition of transfers, but it is better to carry 10 paying passengers every hour than to fill cars running on a two-minute headway with non-paying passengers."

The following day Judge Lacombe, of the United States Circuit Court, handed down a decision which in effect removes the contention of the Public Service Commission with the receivers of the Metropolitan Street Railway as to Fifty-ninth Street transfers from the United States court and turns the matter over to the State courts, which alone, he says, have jurisdiction. The decision says:

"The receivers of the Metropolitan Street Railway Company have applied for further instructions as to transfers.

"They have carefully conformed to the general instructions contained in opinion filed Oct. 8, 1907, to operate the road in accordance with the requirements of law, State and local. When they took possession of the property the Metropolitan Street Railway was operating the Central Park, North & East River Railroad under lease. The statutes of the State provide that in such case transfers should be exchanged, and this was done. On Aug. 6, 1908, operation under the lease ceased and the line was returned to its owner, an independent corporation. No statute, ordinance or regulation, State or local, required the exchange of

transfers in such a case, and such exchange was therefore terminated.

"Thereafter the Public Service Commission issued an order to show cause why transfers were not continued and why some joint tariff should not be established, with a provision requiring separate accounts to be kept for 30 days. The receivers replied to the resolution offering to keep any accounts of records which the commission might wish. They did not appear to show cause for reasons set forth in an opinion of the court, filed June 10, 1908, as follows:

"It has been suggested that the Public Service Commission under Section 49 of the act which created it might require the road to sell and honor these transfers. Whether that section or any other one gives the Public Service Commission power to compel two independent roads to exchange transfers is a question of State law, the construction of a State statute which may more appropriately be left to the State courts. In the event of the receiver being called upon by the commission to take and give such transfers, he will furnish all the information which he, as operator of the road, may be able to procure, and he will notify the owners and security holders of the several roads now in his hands and will see that they are given the opportunity to present whatever arguments they may wish to make in opposition. In the ultimate analysis it is the owners of and lienors on the property whose interests would really be affected by such a construction of the statute—the court and its receiver are custodians merely and are not concerned with its future."

"The commission has now made an order requiring the receivers and the company operating the Central Park, North & East River Railroad to establish through routes and put in force a joint rate of fare by the use of transfers over their respective lines.

"In view of the information now on record in this court as to the financial condition of the two roads and the report recently made to the commission showing that of 20,000,000 passengers carried by the Central Park, North & East River Railroad over 13,000,000 rode on transfers and paid it no fare, it is difficult to see how the operators of the two roads can succeed in agreeing upon a joint rate of the kind suggested.

"The extent of the authority of the commission under Section 49 is not yet exactly defined, since the new act has not yet been construed by the courts. In the event of any proceeding being brought about by the commission in which such construction might be secured, the receivers will appear in any State court and co-operate in every way to secure a prompt determination of any questions presented."

New Freight Tariff at Seattle

The Seattle (Wash.) Electric Company has put into effect a supplement to its freight tariff sheet of May 15, 1907, which made increases in the hauling charges on many of its lines. The new rates and classification to or from the freight station, Fifth and Olive Streets, are as follows:

	Class			
	1st	2d	3d	4th
Fremont .....	.15	.12½	.10	.07½
Green Lake .....	.17½	.15	.12½	.10
Ballard .....	.15	.12½	.10	.07½
Fort Lawton .....	.17½	.15	.12½	.10
Latona .....	.15	.12½	.10	.07½
University .....	.15	.12½	.10	.07½
Ravenna Park .....	.17½	.15	.12½	.10
Youngstown .....	.17½	.15	.12½	.10
Luna Park .....	.17½	.15	.12½	.10
West Seattle .....	.17½	.15	.12½	.10
Lincoln Beach .....	.17½	.15	.12½	.10
Fauntleroy Park .....	.17½	.15	.12½	.10
Madrona Park .....	.17½	.15	.12½	.10

The rates on the Madison Street line to or from east and west terminals and intermediate points are: First class, 17½ cents; second class, 15 cents; third class, 12½ cents; fourth class, 10 cents. Among the changes on Madison Street are increases from 10 cents to 15 cents a hundred on butter, 10 cents to 15 cents a case on eggs, 15 cents to 50 cents on small grips and 25 cents to 75 cents each on trunks, suit cases and large grips. On the other lines the charge on small grips or telescopes has been 15 cents. These have been increased to 50 cents except in the cases of Youngstown, Latona, University and Fremont, which now have a 25-cent rate. The flat rate of 25 cents on large suit cases, grips and trunks has been raised to a minimum of 50 cents and a maximum of 75 cents, Fremont, Latona, University and Youngstown alone now having a 50-cent rate. Lumber, on which the rate has been \$2.50 a thousand,

is now first class if in the shape of finished lumber or for house finishing. Ornamental foreign woods take double the first-class rate. Other woods not specified take second-class rates. Among the articles that have been increased in the classification are brick, glass, egg crates, barrels, asbestos, lime, pianos, organs, crockery and earthenware. Merchandise not otherwise specified in the tariff sheets advances from 7½ cents a hundred to double first class and description is required.

Pay-as-You-Enter Cars on Zone Fare Line in New Jersey

The Public Service Corporation of New Jersey began operating pay-as-you-enter cars on its Bloomfield line, which passes through two fare zones on Aug. 12. The line runs from Caldwell to the Pennsylvania Railroad station, Newark, and the running time is 65 minutes. On cars running to Montclair only passengers deposit cash and ticket fares in fare box and hand transfers to conductor. On the Verona Lake and Caldwell cars fares are collected until the car reaches the Delaware, Lackawanna & Western Railroad crossing, Montclair. To passengers boarding car west of that point in Montclair and desiring to ride beyond the westerly Montclair line conductors issue an identification check when the 5-cent fare is deposited in the fare box, or the fare paid with transfer from Valley Road line, and at Sunset Avenue an inspector boards the car and collects either a 5-cent fare or an identification check from each passenger on the car, registering every fare collected on the inspector's register in the front of car. After the car passes Sunset Avenue fares are deposited in the fare box as passengers enter the car, as usual.

Passengers boarding cars between Caldwell and Sunset Avenue deposit their fares in fare box, as usual. Passengers boarding cars between Sunset Avenue and the Delaware, Lackawanna & Western Railroad crossing in Montclair, also deposit their fares, but those desiring to ride beyond the latter point also receive an identification check when their fare is deposited. Passengers boarding the car with the transfers from the Valley Road line and desiring to ride east of the Delaware, Lackawanna & Western Railroad crossing in Montclair, receive an identification check. At the Delaware, Lackawanna & Western Railroad crossing, in Montclair, an inspector collects an identification check or a 5-cent fare from each passenger on the car, registering same on the inspector's register in the front of the car as on the westbound trip. After the car passes the Delaware, Lackawanna & Western Railroad crossing, Montclair, fares are deposited in the fare box as passengers enter the car, as usual. Conductors register once for each fare deposited in the fare box or paid with a transfer, using the register in the rear of the car. Transfers are issued when fare is deposited. Conductors reset their register at the terminals only and note on the back of their day card the number of fares rung up by the inspector each half trip. Inspectors account for all fares and identification checks collected by them and collect from the front to the rear of the car.

Collision on Michigan Road.—In a head-on collision between two cars on the Detroit, Ypsilanti & Ann Arbor Railway on Michigan Avenue, between Cicotte Avenue and Markey Street, on Aug. 12, 13 passengers were injured.

Brightwood Railway Asked for Figures in Through-Car Case.—The Brightwood Railway, Washington, D. C., has been asked by the Interstate Commerce Commission for the figures supporting adequately its claim that financial reasons prevent the operation of through cars from the heart of the city to Brightwood and Takoma Park.

Newspapers on Cars in Los Angeles.—A contract is said to have been closed between the California Newspaper Vending Machine Company and the Pacific Electric Railway for the installation of newspaper vending machines on 50 cars designed to fit into one of the windows at the end of the closed compartment of the car and carry Los Angeles newspapers, selling them at their regular rates.

Freight Service Being Considered in Philadelphia.—The Philadelphia Rapid Transit Company is considering a plan to establish a freight service in Philadelphia. Nothing official has been decided, but it is understood the plan will include the operation of freight cars over the surface, elevated and subway lines. The merchants of the city have expressed themselves as being in favor of operation of a freight service.

Temperance Signs in Los Angeles.—Cars on the West Adams, West Jefferson, Westlake, Edendale, Belt, Temple, Angeleno Heights, Brooklyn Heights, Pasadena and West Sixth Street lines of the Los Angeles Pacific Railway con-

tain temperance posters, placed there by the W. C. T. U. as a means of carrying on their warfare against the liquor traffic. About 400 of the posters are used, and the advertising will be continued as long as funds are obtainable to meet the expense.

Lehigh Valley Freight Service.—As soon as negotiations now pending between the Lehigh Valley Transit Company and the Philadelphia Rapid Transit Company are completed, the former company will begin a through freight service between Allentown and Philadelphia, operating into the heart of the latter city. The express service will reach the following cities: Allentown, Slatington, Egypt, Siegfried, Bethlehem, Nazareth, Hellertown, Emaus, Center Valley, Coopersburg, Quakertown, Perkasie, Sellersville, Soudertown, Hatfield, Landale, North Wales, Ambler, Chestnut Hill, Philadelphia.

Newton Street Railway Announces a 6-Cent Rate for Transfers.—The Newton (Mass.) Street Railway announced on Aug. 14 that on Sept. 1 it will put into effect a 6-cent fare unit, where transfers are issued, on all of its lines throughout the city where the regular 5-cent fare is now in effect. The Railroad Commissioners recently approved a petition of the company asking for the privilege. In surrounding cities and towns, on a number of lines of this company, 6-cent fares are already in force. It was announced that the present round-trip rate of 15 cents to Norumbega Park will be maintained.

The Question of Baggage in Indiana.—William J. Wood, of the Indiana Railroad Commission, on inquiry made by the Northern Indiana Railroad, has ruled that interurban companies are express and baggage carriers and that the law which pertains to baggage applies to both the interurban and steam lines. Interurban railway officials, however, still maintain that the law containing the section which provides that roads do not have to carry baggage unless they have a special baggage car, was passed especially for their benefit and that the intent of this section of the law is to relieve traction companies from carrying excessive baggage. The electric railways in Indiana carry hand baggage free, but charge 25 cents for a trunk. The question will probably be carried to the courts for settlement.

Penalty Clause on Back of Transfer.—The Staten Island Railway is printing on the back of its transfers a notice in regard to the penalty for their misuse. It reads as follows: "To the public: Attention is called to Chapter 663 of the Laws of 1898, in which provision is made that no transfer ticket shall be issued, sold or given to any person not lawfully entitled to receive the same. The law provides that the person receiving the ticket under such circumstances, and also the person who issues, gives away or sells such ticket may be imprisoned for one year and fined \$500. Persons violating this law may be indicted and convicted for a conspiracy, though the object of such conspiracy has not been executed. It is the purpose of this company to prosecute to the full extent of the law all persons who are detected violating the same."

Public Service Commission Authority Questioned by Interstate Tunnel Line.—The Hudson & Manhattan Railroad Company, operating the tunnel under the North River between New York and New Jersey, questions the jurisdiction of the Public Service Commission of the First District of New York over those parts of the tunnel routes which lie within New York. The commission has asked to be supplied with data similar to that which is furnished to the board by the other roads operating in New York. The company has refused to comply on the ground that as it operates between New York and New Jersey it is subject, not to the authority of the Public Service Commission, but to that of the Interstate Commerce Commission. George S. Coleman, chief counsel to the commission, was directed to prepare an opinion as to whether or not the officials of the Hudson Companies have good grounds for their contention. Mr. Coleman says: "I am of the opinion that the Public Service Commission for the First District has jurisdiction over this company, and that the orders mentioned must be complied with. The fear expressed that if reports are rendered conflicting orders may be given by the State and by the Federal authorities may be disregarded. It is to be assumed that the commission will act within its jurisdiction in issuing any of its orders. There is no doubt that subject to action of Congress the State can require this railroad to guard against accidents; it can regulate the holding of stock; it can insist upon adequate appliances, as car bodies and motors, to transport the traffic; it can require that no corporation operate a railroad without a franchise. The mere fact that a corporation is engaged in interstate commerce does not permit it to usurp special franchises for that purpose."

Personal Mention

Mr. F. S. Pratt has been elected president of the Houghton County Street Railway, Houghton, Mich., to succeed Mr. Henry G. Bradlee.

Mr. J. M. Hood, Jr., principal assistant engineer of the United Railways & Electric Company, Baltimore, Md., has been appointed engineer of way of that company.

Mr. George Kuhrts, chief engineer of the Los Angeles Railway and of the Redondo Railway, has been appointed general manager of the San Bernardino (Cal.) Traction Company. Mr. Kuhrts succeeds Mr. A. C. Denman, Jr., who has resigned, as previously noted in this column.

Mr. Gordon Campbell, purchasing agent and master mechanic of the Washington (D. C.) Railway & Electric Company, has been elected vice-president and general manager of the York (Pa.) Street Railway, to succeed Mr. David Young, Jr., who has resigned as general manager.

Mr. F. H. Knox, formerly chief engineer and general manager of the Boise (Idaho) Interurban Railway, has been appointed vice-president and general manager of the Spartansburg Railway, Gas & Electric Company, Spartansburg, S. C., to succeed Mr. F. D. McEowen, president, treasurer and general manager of the company.

Mr. E. H. Raupp, who has been superintendent of the Youngstown & Southern Railway, Youngstown, Ohio, for the past two years, has been appointed general manager of the company, succeeding Mr. S. J. Dill, who, as was recently announced in the *ELECTRIC RAILWAY JOURNAL*, has become general manager of the Elmira Water, Light & Railroad Company, Elmira, N. Y.

Mr. A. B. Merrihew, formerly chief inspector for the Los Angeles Railway, has been appointed superintendent of the San Bernardino (Cal.) Valley Traction Company. Mr. Merrihew has recently been connected with the Los Angeles Pacific Railway. He came to Los Angeles in 1896, and at once entered the employ of the Los Angeles Railway as a conductor. Seven years ago he was made chief inspector, which position he has filled since that time.

Mr. J. C. Lightfoot, Jr., Philadelphia, has been elected secretary and treasurer of the Chattanooga (Tenn.) Railways and the Lookout Mountain Railway, of Tennessee, with headquarters in Philadelphia, vice Mr. W. H. Lawton, resigned. Mr. Lightfoot for the last seven months has acted in capacity of general auditor for the companies mentioned, and for six years prior thereto was assistant treasurer of the Beaver Valley Traction Company, Beaver Falls, Pa. Before entering the street railway field he was purchasing agent for the American and Red Star steamship lines, and filled a number of important positions with Peter Wright & Sons, Philadelphia.

Mr. Clark Prather has recently been appointed master mechanic of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y. Mr. Prather has been connected with electric railway work about 10 years and has served with a number of city and interurban properties in both the East and the West. His first work was with the Union Traction Company of Indiana, on the overhead lines between Indianapolis and Anderson. Leaving that company, he became connected with the Indianapolis Traction & Terminal Company, and served in its power stations, substations and shops. At the time of the World's Fair in St. Louis, Mr. Prather accepted a position with the United Railways Company of that city and during the preparations for the fair was assistant foreman and foreman, respectively, of the Newstead shops and the Virginia and Walsh shops of the company. Later he became connected with the Brooklyn Rapid Transit Company as foreman of the Fifty-eighth Street shops of that company and subsequently entered the employ of the Public Service Corporation in the shops at Westfield, N. J. From Westfield, Mr. Prather went to Paterson for the Public Service Corporation and served there for about three years. Subsequently he became superintendent of the Roanoke Railway & Electric Company, Roanoke, Va. Following his connection with that company, Mr. Prather became interested in the firm of I. R. Nelson & Company, and as a member of that firm took charge of the equipment of 155 pay-as-you-enter cars for the New York City Railway. While still with Nelson & Company, Mr. Prather went to Rochester to equip 17 cars for the Buffalo, Lockport & Rochester Railway and later accepted the position as master mechanic of that company.

OBITUARY

Edgar Parker, assistant manager of the Mankato (Minn.) Electric Traction Company, recently succumbed to typhoid fever.

NEW PUBLICATIONS

Secondary Stresses in Bridge Trusses. By C. R. Grimm, New York: John Wiley & Sons; 1908; 140 pages (6 in. x 9 in.); illustrated. Price, \$2.50.

Secondary stresses, while they do not enter as an important factor in most bridge construction, demand consideration in long span work. The treatment in this work necessarily is largely mathematical. The references include a complete bibliography of this subject.

Tables of Quantities for Preliminary Estimates. By E. F. Hauch and P. D. Rice. New York: John Wiley & Sons; 1907; 92 pages (6¾ in. x 4 in.). Price, \$1.25 net.

This is a work designed for the locating engineer and for accuracy all the calculations have been made to five and in some cases to seven place logarithms. The earthwork tables cover calculations for roadbeds of different slopes up to 35 ft. width. To permit the ready preparation of tables for special cases, the formulas and the methods of calculation are appended. The authors have also included tables of acreage, chains to feet, feet to decimals of a chain, fractions of an inch in equivalent decimals and other data of value in earthwork calculations.

The Blacksmith's Guide. By J. F. Sallows, Brattleboro, Vt.: The Technical Press; 1907; 148 pages (4¾ in. x 7 in.), with two-color plates and inset; illustrated. Price, \$1.50.

This book should find a cordial welcome in the blacksmith department of every railway shop, as the author's experience embraces practically every kind of work that is likely to be offered for a smith's attention. The book also includes some practical hints on the arrangement of the equipment in the shop and gives particular attention to the working of modern high-speed steels. Not the least valuable features of the work are the well-written text and the neat and clearly reproduced drawings.

Zur Eröffnung der Untergrundbahn nach Westend (Opening of the Subway to Westend). By P. Wittig, Berlin; 1908; cloth; 21 pages, 9 in. x 12 in., with one color plate and colored map.

This is a well-printed souvenir album prepared by Mr. Wittig to signalize the opening of the Westend subway extension of the Berlin elevated-subway system, of which he is a director. Westend is a high-class suburb of Berlin and its realty development is in the hands of interests connected with the railway company. This album contains a comparatively large number of illustrations, taken during the construction period and after. The stairway street exits are particularly interesting, as they show the artistic effects possible with steel work. There are also some historical views illustrating different stages in the growth of the district served by the new line.

The Signal Dictionary. Edited by B. B. Adams and Rodney Hitt; New York; 1908. Published by the *Railroad Age Gazette*; 9 in. x 12 in.; 514 pages, 3120 illustrations. Leather, \$6.

This is a companion volume in size and arrangement to the well-known Car Builders' Dictionary and Locomotive Dictionary from the same publishers. It is, however, more nearly a complete encyclopedia of the railway signaling art than a mere dictionary of terms, as its title would indicate. The 32 pages of definitions are only a small part of the descriptive matter which is interpolated frequently throughout the 472 pages of illustrations. Minute explanations of the construction and operation of signal mechanisms and accessories of every kind accompany the illustrations and diagrams of these parts; this is a convenient arrangement and adds greatly to the value of the book. With the aid of the diagrams and the explanatory text any person familiar with the elements of mechanics and electricity can readily understand the operation of the most complex signal schemes. Some idea of the completeness with which the field of railway signaling has been covered in this unique volume can be had from the list of subject headings which is in part as follows: Signal drawing symbols, signal indications, block signal arrangements, manual, controlled manual and automatic block signal mechanisms, signals for electric roads, highway crossing signals, typical interlocking plans, mechanical, electric, electro-pneumatic and pneumatic interlocking machines and accessories, route and check locking and nearly a hundred headings under block and interlocking accessories. An appendix includes train order signals, switch targets, track signs and movable hand, lamp and torpedo signals. A table in the front of the book gives complete information as to the extent of the use of the block system on the steam railroads in the United States, including the name of the railroad, the number of miles operated with block signals and the method of signaling used. There is also a brief history of the progress of the signaling art in the United States.

Construction News

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

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

FRANCHISES

Edmonton, Alb.—This city has purchased the 33-year street railway franchise of the Strathcona Radial Tramway Company. The price paid for the franchise was \$10,000, excluding the amount already spent by the company on grading. It is expected to have the Strathcona line completed by Jan. 1. Three miles in Strathcona and the same amount in Edmonton are to be completed and in operation in three months.

Fruitvale, Cal.—The Supervisors have granted the application of A. W. Maltby and Joseph Naphthaly for permission to operate an electric street railway through the Alameda County part of Alameda-Contra Costa tunnel, for a term of 5 years. The proposed road is to run from Walnut Creek, Contra Costa County, to Oakland.

***Redwood City, Cal.**—S. M. Snyder, of North Fair Oaks, has applied for a franchise for an electric railway from the southerly boundary of the town in a general northern direction to connect with the right of way of the Peninsular Electric Railroad just north of the depot.

Richmond, Cal.—The East Shore & Suburban Railway has been granted a 50-year franchise for the operation of an electric railway on San Pablo Avenue.

Riverside, Cal.—The Riverside & Arlington Electric Railway has been granted a franchise by the Council for an electric railway from the city limits on the west, along Magnolia Avenue and coinciding with the present line through Riverside as far as First Street, and northwesterly to Fairmount Park.

Anderson, Ind.—The City Council has extended the local franchise of the Indiana Union Traction Company 20 years, or until 1922, as agreed to in consideration of the traction company executing a franchise contract to build and operate permanent car shops in this city.

Anderson, Ind.—The Board of County Commissioners has granted a franchise to the Elwood-Swayzee Traction Company to use 2 miles of the public highways north from Elwood and 1 mile of road near Leisure for the use of its line. The cars on this line are to be driven by gasoline motors. It is stated that upon the completion of the 17-mile line from Elwood to Swayzee another line will be built from Elwood through Perkinsville and Noblesville to Indianapolis.

Elkhart, Ind.—The Kalamazoo, Elkhart & South Bend Traction Company has asked the Board of Public Works for an extension of the time limit which was set for the completion and the operation of the line through Elkhart.

Marion, Ind.—The County Commissioners have granted to the Marion & Logansport Traction Company an extension of one year in the time limit for the completion of the proposed Marion-Logansport line in Grant County, the new franchise giving the company until Feb. 1, 1910, to finish work on its lines and have them in operation. [E. R. J., Aug. 15, '08.]

Sioux City, Ia.—In a vote on Aug. 11, an ordinance unifying the various franchises of the Sioux City Traction Company and granting an extension of 25 years was adopted. Under the terms of the franchise the company is to pay 2 per cent of its gross earnings when the city shall have attained a population of 75,000.

Billings, Mont.—N. S. Poole, of Townsend, Mont., has purchased a franchise for an electric street railway which was granted to Yegen Brothers by the City Council some months ago. It is stated that Yegen Brothers retain some of the stock and that the company will be organized for the purpose of constructing a line in the city and through the valley. [S. R. T., Aug. 17, '08.]

Syracuse, N. Y.—It is announced that the Syracuse Rapid Transit Company will apply for a franchise this fall for the extension of its tracks to the stadium at the Syracuse University.

***Haskell, Tex.**—The Haskell & Rule Street Railway has applied for a franchise to construct an electric street railway from Rule to Haskell. J. H. Mahan, promoter.

Staunton, Va.—A new street railway franchise has been granted by the City Council to the Blue Ridge Light & Power Company, which is at present operating the street car system in this city. The franchise covers every street of importance in Staunton. [E. R. J., Aug. 1, '08.]

Seattle, Wash.—The Seattle, Snohomish & Everett Railway has petitioned the County Commissioners for a fran-

chise for the use of the Erickson county road, between the city limits, north of Ravenna, and the town of Bothell, covering 11 miles. The proposed road is planned to enter the city north of the University district and come downtown either over the Seattle Electric Company's tracks, or over tracks of its own, crossing Union Bay from the Laurelhurst addition. Ultimately it is to reach Snohomish and Everett.

NEW INCORPORATIONS

***Eastern Transit Company, Hartford, Conn.**—This company has been incorporated in Connecticut with an authorized capital stock of \$50,000. James W. Knox, Hartford, president; H. J. Williams, Cambridge, secretary, and James Lee Loomis, Hartford, treasurer. It is said that the concern may develop into a holding company for some other transit lines.

Houghton County Traction Company, Houghton, Mich.—This company has been organized for the purpose of operating the Mohawk extension and it is the intention of the company ultimately to take over the Houghton County Street Railway.

Rochester, & Manitou Beach Railroad, Rochester, N. Y.—This company has been incorporated as the successor to the Rochester, Charlotte & Manitou Beach Railroad Company. The old road went into the hands of a receiver, W. Butler Crittenden, and was bought at auction on July 21 by Kendall B. Castle. Capital stock, \$60,000, including property formerly owned by the old company. Directors: Jacob Gerling, Charles S. Briggs, S. J. Scudder, Kendall B. Castle, Fred W. Odenbach, Henry W. Wedel, of Rochester; David Hyam and Allen J. Holloway, of Buffalo, and Frank Gellie, of St. Johnsville.

***Marion & Galion Electric Railway, Marion, Ohio.**—This company has been incorporated to construct an electric railway between the towns named in the title. Capital stock, \$10,000. F. H. Murphy, of Cleveland, is one of the incorporators.

Aberdeen (S. D.) Street Railway.—Incorporated in South Dakota to construct an electric street railway within the city of Aberdeen. Capital stock, \$500,000. Incorporators: F. B. Gannon, E. J. Bucholz and C. A. Russell. [E. R. J., Aug. 15, '08.]

Huron (S. D.) Street Railway.—Incorporated in South Dakota to build a street railway in the city of Huron. Capital stock, \$500,000. Incorporators: H. J. Rice, R. C. Gibbs and F. H. Holton. [E. R. J., Aug. 15, '08.]

TRACK AND ROADWAY

Birmingham & Gulf Railway & Navigation Company, Tuscaloosa, Ala.—The Birmingham & Gulf Construction Company is reported to have given up the contract to build and electrify the electric line from Tuscaloosa to Gadsden. All the equipment and supplies of every description owned by the construction company were sold outright to the railroad company for a lump sum.

Mobile, Ala.—It is announced that the American Securities Company will build a street railway to Pine Crest Cemetery from the present terminus of the Mobile Light & Railroad Company's tracks on the Michigan Avenue extension.

Mobile, Ala.—Within 60 days it is said that engineers will begin work surveying the proposed route of the electric railway from Citronelle to Mobile. George S. Bressler, of Gulf Crest, Ala., who is interested in the project, states that all lands over which it is proposed to operate the road have been secured. In addition Mr. Bressler announces that most of the money to be expended in building the road will be furnished by capitalists of Louisville and Cincinnati. C. A. Elkins, of Louisville, is also interested in this new road. [S. R. J., Feb. 29, '08.]

British Columbia Electric Railway, New Westminster, B. C.—The contract for the grading, etc., of the second section of the line between New Westminster and Chilliwack has been awarded to Ironsides, Rannie & Campbell by the British Columbia Electric Railway. The section includes the 26-mile stretch between Cloverdale and Abbotsford and the cost represented by this part of the undertaking will be about \$190,000.

Ocean Shore Railway, San Francisco, Cal.—Contracts have been awarded by this company to the Ransome Construction Company, San Francisco; the Humboldt Construction Company, San Francisco, and Lilly & Heins, Santa Cruz, Cal., for building 37 miles of railway between Granada and Scotts Creek, Cal. Ralph W. Heins and C. E. Lilly, of Santa Cruz, will grade the roadbed from Granada to San Gregorio and from Pescadero to Folger, a total distance of 33 miles. The Ransome Construction Company will build the 4 miles from San Gregorio to Pescadero under a previous arrangement and the Humboldt Construction Com-

pany will build the bridges. This section will be a connecting link between two portions now in operation, as follows: Between San Francisco and Granada, 27½ miles; and between Santa Cruz and Folger, 16½ miles. J. D. Harvey, president, and J. B. Rogers, chief engineer, 52 Eleventh Street, San Francisco.

Havana (Cuba) Electric Railway.—Gov. Magoon has approved the petition of this company for the construction of a number of important extensions in Havana.

Honolulu Rapid Transit Company, Honolulu, Hawaii.—This company contemplates soon extending its system 12 miles from Honolulu to Pearl Harbor.

Nezperce & Idaho Electric Railroad, Nezperce, Idaho.—Contractors of this proposed electric railroad have completed more than a mile of new grading and more than one-half of the entire line is now graded and ready for the rails. Additional men and teams are being added to the forces in order to rush the work to completion before fall. Practically all of the right of way has been secured. Z. A. Johnson, promoter. [E. R. J., June 27, '08.]

Clinton, Ia.—Thomas Wilcox, promoter of the proposed line connecting Clinton with Dubuque, states that five surveyors have been placed in the field to make the final survey of the route. It has been definitely decided to construct the line via Maquoketa, the county seat of Jackson County. The line will be a few miles longer than an air line on this account, but the grades will be easier and the work of construction much less than a line due north from Clinton to Dubuque. A large part of the right of way has already been donated.

***Council Bluffs, Ia.**—Representatives of a number of towns in Pottawamie and Shelby counties recently met at Trener, Ia., and organized a stock company with an authorized capital of \$1,000,000 for the purpose of constructing an electric railway between Des Moines and Council Bluffs. The Metropolitan Trust Company, of Chicago, is said to be in charge of the financial end of the project. Surveys of the line have been completed and it is said the route between the cities named is 14 miles shorter than any existing line. It is proposed to use gasoline motor cars for passenger and steam for freight trains.

***Council Bluffs, Ia.**—It is reported that a company, to be known as the Independent Transportation Company, is being organized to promote the construction of a street railway over the streets of Council Bluffs. Judge J. R. Reed, A. T. Flickinger and Henry Sperling are said to be interested in this project.

Albia (Ia.) Interurban Railway.—Patrick Fitzgerald, of Atlantic, Ia., has been awarded the contract for the grading of this company's entire line to Hiteman.

***Idagrove, Ia.**—S. T. Bondhus & Company, of New York, are said to be working on a scheme for an electric railway system that is planned to extend from Chicago to Sioux City. T. T. Warens, of Storden, Minn., is the local representative. It is understood that the old Great Western survey from Wall Lake to Sioux City is the route the company has in view for the division of the road, which is to cross northwest Iowa.

Chicago (Ill.) Railways.—This company, it is reported, has ordered special track work to the amount of 800 tons from the Pennsylvania Steel Company.

Chicago (Ill.) City Railway.—This company is reported to have placed an order for about 300 tons of special track work for the Archer Avenue house with the Lorain Steel Company. The order amounts to about \$28,000. The company also has ordered 80 tons of tie plates from the Pennsylvania Steel Company.

Northwestern Elevated Railroad, Chicago, Ill.—This company has awarded contracts for construction of a stub terminal at Kinzie Street, calling for about 1200 tons of structural work. The contract was awarded to the Brennan Construction Company, and the steel will be furnished by the Morava Steel Construction Company, Chicago.

Frankfort, Ind.—In the special election held on Aug. 11 by the city of Frankfort and Center Township on the question of a subsidy of \$50,000 for the Frankfort, Delphi & Northern Traction Company the majority against the proposition was about 700. At the same time Boss Township voted on the proposition of a subsidy of \$15,000, but this was also defeated. [E. R. J., June 13, '08.]

***Ferdinand Railroad, Jasper, Ind.**—This company has been organized to construct an electric railway from Ferdinand to Huntington, a distance of 7 miles, and is to be completed by Jan. 1, 1909. Capital stock, \$150,000. O. W. Blickenstaff, Lafayette; D. H. Morgan, Brazil; N. P. Carter, Indianapolis, are reported to be interested in this company.

Lexington & Interurban Railways, Lexington, Ky.—This

company is engaged in building a 12-mile interurban line to Nicholasville. J. B. Crawford, manager.

Lake Charles (La.) Railway & Light Company.—This company, which is the successor to the Lake Charles Street Railway, expects to close contracts during the next few weeks for the construction of 1½ miles of track. J. A. Landry, manager.

Boston, Mass.—Bids are asked by Lieut.-Col. Edw. Burr, Corps Engineers, U. S. A., Boston, until noon, Aug. 31, for furnishing and delivering electrical machinery, cable, rails, trolley and track material, etc.

Mexico (Mex.) Electric Tramways.—This company has applied to the Superior Council of the Federal District Government for permission to build a new line to reach the new Covadonga Park of the Spanish colony in time to establish the service before the next Covadonga festivities, in September.

Yazoo City, Miss.—The bonds issued about a year ago for a street railway for Yazoo City were signed on Aug. 13 and delivered to the Saunders-Johnson Company, who paid over the money to the City Treasurer. Work will begin at once and the road will be completed in 90 days.

North Jersey Rapid Transit Company, Paterson, N. J.—At a meeting of the directors of this company, formed to build an electric railway from Suffern, N. Y., to Paterson, the following officers were elected: President, William A. Barbour; vice-president, Malcolm R. McAdoo; secretary and treasurer, H. H. Parmalee. The company is capitalized at \$2,000,000. Construction will be started at once. [E. R. J., Aug. 1, '08.]

Albany, N. Y.—The Public Service Commission, Second District, has granted the application of the Western New York & Pennsylvania Traction Company for permission and approval to construct an extension of its road in the village of Salamanca to and into the village of Little Valley.

Brooklyn (N. Y.) Rapid Transit Company.—It is said that this company has plans under consideration for the extension of its Metropolitan Avenue line from its present terminal at St. John's Cemetery, Middle Village, to Jamaica.

Brooklyn Union Elevated Railroad, Brooklyn, N. Y.—This company has made application to the Public Service Commission for the right to construct certain elevated tracks along the Flatbush Avenue extension, from Fulton Street to the Manhattan Bridge, and for the exclusive right for at least two tracks on the new Manhattan Bridge.

Champlain & Sanford Railroad, Albany, N. Y.—The up-State Public Service Commission has granted permission for the construction of this line. The new road is to be operated by electricity and will run from the terminus of the Delaware and Hudson at Riverside for a distance of 58 miles to the Lake Sanford iron ore mines in Essex County, which feed the Port Henry Iron Company's plant. J. MacN. Thompson, president. [E. R. J., Aug. 8, '08.]

Geneva, Waterloo, Seneca Falls & Cayuga Lake Traction Company, Geneva, N. Y.—It is reported that this company will extend its system as far as Auburn to connect with the Auburn & Syracuse Electric Railroad.

New York, N. Y.—The Gore Engineering & Contracting Company, 206 Broadway, New York, has been awarded the contract for constructing the outer trolley tracks of the Blackwell's Island Bridge, over the East River. The amount bid by this company was \$24,993. The contract for the construction of block signals for the elevated railway tracks of the Williamsburg (new East River) Bridge was awarded to the Union Switch & Signal Company for \$7,680. [E. R. J., Aug. 1, '08.]

Raleigh (N. C.) Electric Company.—This company will double-track its street railway line from the Cameron field switch, Hillsboro Street, to the State Fair Grounds. H. H. Carr, general manager.

Wellsville, Ohio.—Construction of interurban roads that will close all gaps and connect Columbus, Cleveland and Cincinnati with Pittsburg and extend the Ohio Valley chain of roads to Pomeroy is expected within the next eight months by traction interests here. Northern Ohio capital is said to be ready to build a line from Bellaire to Zanesville, completing the connection between Pittsburg and the Ohio cities, while it is said A. D. Domalo, of New York, has announced his intention of completing at an early date the gaps along the Ohio Valley, from Wheeling to Parkersburg, W. Va. Capitalists of East Liverpool, Ohio, have about completed arrangements to bridge the Ohio River at Parkersburg, extend an interurban line to Pomeroy and connect with the Columbus systems. [E. R. J., June 6, '08.]

Oklahoma City (Okla.) Street Railway.—This company is said to be planning a number of extensions to be made

within the next 60 days to cost about \$50,000. It is stated that a line will be built to the State Fair Grounds in time for the fair in October. This line will be double track and will cost \$40,000.

Oklahoma City-El Reno Electric Interurban Railway, Guthrie, Okla.—Philadelphia capital is reported back of the proposed construction of this line, and the work of grading is expected to commence Nov. 15, according to statements by local promoters. The surveys have been completed between the two towns, and the work of acquiring right of way is going on gradually. Scott Jones, of Chickasha, president and promoter of the electric interurban between Chickasha and Sulphur, a distance of about 100 miles, announces that the project has been financed in New York City, and that the money will be forthcoming just as soon as the bonus specified is raised. A special election will be called in El Reno on the proposition for granting the company a four-year extension on its franchise. The life of the franchise is 21 years, the company claiming that its bonds can be better disposed of if the company has a 25-year franchise. The first mile of line has been completed and will be extended as soon as material arrives.

Toronto Suburban Railway, Toronto Junction, Ont.—It is said that this company contemplates building an extension to Swansea. G. E. Royce, manager.

Oregon Coast Railway, Astoria, Ore.—This company was recently organized with a capital stock of \$10,000 for the purpose of raising money for surveys, obtaining rights of way and franchises for the Astoria, Seaside & Tillamook Railway, which proposes to construct an electric railway to connect Astoria and Tillamook via Seaside. F. L. Evans writes that the preliminary survey has reached Seaside and the company is now perfecting the location, after which the engineers will be placed in the field from Seaside to Tillamook and construction begun on the first section. [E. R. J., July 25, '08.]

Clatskanie & Nehalem Valley Electric Railway, Clatskanie, Ore.—A meeting was held some days ago to discuss the proposed electric railway between Clatskanie and the Nehalem Valley, with Jewell, Clatsop County, as present objective point, connecting with the A. & C. Railway at this place, distance to be covered about 33 miles. D. R. Nelson, of Portland, represented promoters, who require free right of way and stock subscriptions to the amount of \$25,000 to \$50,000. [E. R. J., July 25, '08.]

Oregon City, Beaver Creek & Molalla Railway, Oregon City, Ore.—F. M. Swift, who is backing the project to construct an electric railway from Oregon City into the Beaver Creek, Molalla and Wilhoit Springs sections of Clackamas County, has filed notice of the appropriation of water from the main channel of the Molalla River, to be diverted about three-quarters of a mile below a point, where the north and south forks of the river come together.

Augusta & Edgefield Electric Railroad, Edgefield, S. C.—W. P. Calhoun, chairman; W. A. Strom and S. B. Mays, a subcommittee of the board of incorporators of this company, have been authorized to at once advertise for bids for the survey of the road from Augusta via Edgefield to Greenwood. It is stated that the company will be organized at an early date. [S. R. J., May 23, '08.]

Gainesville, Whitsboro & Sherman Electric Railway, Gainesville, Tex.—This company, incorporated in Texas in 1906 to build an electric railway from Gainesville to Sherman, Tex., 39 miles, has filed a first mortgage to the American Trust & Savings Bank of Chicago, trustee, securing an issue of \$1,000,000 6 per cent gold bonds dated June 20, 1908, and due June 20, 1928. Denominations \$500 and \$1,000. Interest July and January at office of trustee. As yet no part of the road is in operation, but a portion is under construction, to be completed by next March. Twelve miles had been graded to July 20. Officers: John King, president, Gainesville, Tex.; J. M. Downard, treasurer, and Thos. M. Bosson, secretary.

Nooksack Valley Traction Company, Bellingham, Wash.—This company will have its engineers in the field soon, and work will begin simultaneously on the Ferndale and Lynden lines of the right-of-way strip along the Guide Meridian road. J. E. Morrison is in charge of all the preliminary work. [E. R. J., Aug. 15, '08.]

Okanogan Electric Railway, Spokane, Wash.—Horace B. Skinner, of Spokane, formerly of New York, has been chosen general superintendent of this company and is making arrangements to take personal charge of the work of construction of the line, which, it is stated, will begin within two months. It is said that the new line is practically financed. Mr. Skinner states that nearly all of the right of way for the new line has been secured and that the

company has obtained contracts and guarantees for ore tonnage which will make it a profitable line from the start. [S. R. J., May 16, '08.]

Spokane & Inland Empire Railroad, Spokane, Wash.—A party of engineers has been at work for several days running lines through Hatwai Canyon as advance work in the extension of this company's line from Moscow to Lewiston.

Fairmont & Clarksburg Traction Company, Fairmont, W. Va.—Work is now started on the extension of this company's system down Parks Avenue toward the depot, to connect with the new bridge that is being built over the Monongahela River. The line will be extended over the bridge to the new fair grounds on the east side of the river.

POWER HOUSES AND SUBSTATIONS

Little Rock (Ark.) Railway & Electric Company.—A contract has been placed with the Western Electric Company for a 1500-kw turbine. The company is also engaged in enlarging the water-purifying plant at the power station. A new coal storage plant is also under way. It is stated that the amount being expended at the power station reaches \$130,000 or more.

San Francisco, Vallejo & Napa Valley Railway, Napa, Cal.—This company has recently placed an order with the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., for one 800-kw, two-bearing, motor-generator frequency changer set, 6600-volt, single-phase, 25-cycle, alternating-current, revolving-field generator, 1150-hp, 2200-volt, three-phase, 60-cycle, constant-speed induction motor. This shipment is now on the road.

United Railroads of San Francisco.—It is said that negotiations are in progress between the officials of the United Railroads and the officers of the Stanislaus Power Company for entering into a long-term contract, whereby the latter is to supply electric power to the former company. It is possible that later on interests affiliated with the United Railroads may purchase the plant of the power company.

Lexington & Interurban Railways, Lexington, Ky.—This company has recently purchased a 300-kw, 25-cycle rotary converter, also one 400-hp boiler from the Babcock & Wilcox Company.

Albany & Hudson Railroad, Hudson, N. Y.—It is announced that this company is planning improvements, including the purchase of a 2000-hp steam turbine, a 500-kw motor-generator set and the erection of a new boiler house.

Spartansburg (S. C.) Railway, Gas & Electric Company.—This company, which was recently purchased by Pittsburg interests identified with the Electric Manufacturing & Power Company, has modified its power scheme. The steam plant of the company is to be dismantled and power is to be taken from the Electric Manufacturing & Power Company, through a substation equipped with Westinghouse apparatus.

SHOPS AND BUILDINGS

Marion, Ind.—The Marion, Bluffton & Eastern Traction Company and the Kokomo, Marion & Western Traction Company recently purchased property on Fifth Street to be used as a freight station.

Lexington & Interurban Railways, Lexington, Ky.—The Combs Lumber Company has been awarded the contract for the erection of a car house and repair shop for the railway company. The Combs Lumber Company has sublet the concrete foundation work to F. T. Justice & Company. [E. R. J., July 25, '08.]

Ohio Valley Traction Company, East Liverpool, Ohio.—The Guy Johnston Contracting Company, of Toronto, has been awarded the contract for the car house to be erected by this company in the East End, East Liverpool. The building will be built of brick and steel, and it is estimated will cost \$40,000.

AMUSEMENT PARKS

Citizens' Electric Company, Eureka Springs, Ark.—A. M. Barron, manager, writes that this company will build an airdome and a concession building at its park.

Carbon Transit Company, Mauch Chunk, Pa.—Plans have been completed for a large pavilion to be erected by this company on Flagstaff Mountain, 3 miles from Mauch Chunk. Flagstaff Mountain is 1600 ft. above sea level and will be developed by the Carbon Transit Company as a park. The pavilion will be 100 ft. x 58 ft. in dimensions and 14 ft. high. It is intended for all forms of entertainment, such as dancing, basket ball, etc. It will be so arranged as to be suitable for moving picture shows. An arcade or balcony will be suspended in the center for moving-picture machines. Work on the erection of the pavilion will be commenced in a few days.

Manufactures & Supplies

ROLLING STOCK

Binghamton (N. Y.) Railway is considering the purchase of four 22-ft. closed car bodies. J. P. E. Clark, manager.

East St. Louis & Suburban Railway, East St. Louis, Ill., has ordered 90 equipments from the National Brake & Electric Company.

Lewiston, Augusta & Waterville Street Railway, Augusta, Maine, has ordered eight equipments from the National Brake & Electric Company.

Kokomo, Marion & Western Traction Company, Kokomo, Ind., expects within the next few weeks to place orders for solid-steel car wheels. P. H. Palmer, engineer.

Street Railway Department, Berlin Light Commissioners' Office, Berlin, Ont., recently had a 40-ft. car rebuilt by the Preston Car & Coach Company. This car runs between the postoffice and Grand Trunk station and carries all the mail and hand baggage between these places, and it was for this reason that the vestibules were enlarged to 10 ft. and the cross seats taken out and replaced by longitudinal seats.

Chambersburg, Greencastle & Waynesboro Street Railway, Waynesboro, Pa., has recently received from the J. G. Brill Company two semi-convertible cars and a combined smoking and baggage car. Details of the cars follow:

Seating capacity	44	Width over all	8 ft. 4 in.
Weight	43,500	Body	Wood
Wheel base	4 ft. 6 in.	Underframe	Wood
Length of body	31 ft. 8 in.		
Over vestibule	41 ft. 8 in.		

Special Equipment

Air brakes	Westinghouse	Hand brakes	Peacock
Axles	4½ in.	Heating system	
Brakeshoes	M. C. B.	Consolidated Electric	
Car trimmings	Bronze metal	Headlights	
Control system		Crouse-Hinds Arc	
	Westinghouse K-28 B.	Interior finish	Mahogany
Couplers	Brill	Motors	4-West. 101-B
Curtain fixtures	Forsythe	Paint	Green and yellow
Curtain material		Sanders	Nichols Lantern Air
	Printed duck	Seats	Brill
Gears and pinions	Nuttall	Trucks	Standard 0-50
Gongs	Brill		

TRADE NOTES

Worcester Railway Supply Company, Worcester, Mass., has received an order from the Pacific Electric Railway, Los Angeles, Cal., for 500 of its double-acting fenders.

South Bend Construction Company, Michigan City, Ind., has been incorporated under the laws of Ohio to construct electric railways, power houses, etc. H. W. Wallace is the principal resident agent.

F. A. Strail, recently with the Public Service Railway, Newark, N. J., and formerly of the Ohio Brass Company, has accepted a position with the Electric Service Supplies Company, Philadelphia and Chicago, to represent it in New York State and the New England States.

Nachod Signal Company, Philadelphia, Pa., has purchased the electrical interests of the United States Engineering Company, Philadelphia. C. P. Nachod is general manager of the new company and has resigned from all connection with the United States Engineering Company. The Nachod Signal Company will be located at the address of the United States Engineering Company, 929 Chestnut Street.

Independent Pneumatic Tool Company, Chicago, Ill., has appointed H. W. Petrie, Ltd., Toronto, Ont., Montreal, Que., and Vancouver, B. C., exclusive agents for the sale of the Thor pneumatic tools and appliances in Canada. H. W. Petrie will carry a complete stock of the Independent Pneumatic Tool Company's pneumatic tools and appliances in their various stores for immediate delivery.

Schutte & Koerting Company, Philadelphia, Pa., has recently taken two orders for the Koerting patent oil firing system for the new battleship *North Dakota*, being built by the Fore River Shipbuilding Company, and the *Delaware*, being built by the Newport News Shipbuilding Company. This system is in successful use in the English and German navies, the new English *Dreadnaught* class being equipped with the oil-firing system. Catalog 6-o describes the system and can be obtained from the manufacturers.

Goldschmidt Thermit Company, New York, N. Y., is building a new machine shop and foundry on a site 34 ft. x 90 ft. just back of its present factory in Jersey City, to be fitted up to handle to better advantage the extensive repair work which is now being carried on at its works. Traveling

cranes will be provided and no expense will be spared to make the building the most complete thermit repair shop in the country. Special attention will be paid to the rapid execution of the repair to electric motor cases, truck frames, cast steel gear wheels, crankshafts and all wrought-iron and steel sections not exceeding 2000 lb. in weight.

I. R. Nelson & Company, Newark, N. J., have recently completed an important contract for overhauling the rolling stock and overhead construction for the receiver for the Camden & Trenton Electric Railway, Trenton, N. J. The overhead construction was renewed wherever necessary, motors and trucks of the rolling stock were inspected, repaired and overhauled, and the cars painted. Three cars, which had been damaged in a collision, were completely rebuilt. I. R. Nelson & Company are prepared to undertake contracts of a like nature in any part of the country, and have in their employ an efficient staff of mechanics ready for transportation at short notice.

Blake Signal & Manufacturing Company, Boston, Mass., is referred to in the *Evening Capital*, of Annapolis, Md., of Aug. 1, 1908, under the caption, "Official Route of Red Men—Washington, Baltimore & Annapolis selected to transport next Tuesday's crowd." The article said: "In selecting the route the officials were impressed with the high degree of safety with which the single-track section, between Naval Academy Junction and Annapolis, has recently been brought by the installation of the Blake signal system. * * * A demonstration of the working of the Blake system on the single track convinced them that the Annapolis Branch was equally as well protected against accident as the double-track portion of the road."

Allis-Chalmers Company, Milwaukee, Wis., has compiled a list from orders recently taken by the company for power generating units of the several types built in its works, showing the variety of industries represented and the need, evidently felt by each manufacturer, of providing greater power facilities to meet the now increasing demand for his products. Among the contracts let for Corliss engine units, which in most cases include generators and in others a full complement of accessory apparatus, such as exciters, transformers, motors, switchboards, etc., are machines to be installed by the Keith Car & Manufacturing Company, Sagamore, Mass.; El Paso Foundry & Machinery Company, El Paso, Tex.; Diamond Roller Mills, of The Dalles, Ore.; Corn Products Manufacturing Company, comprising units of 3000 hp for the new glucose factory at Argo, Ill.; Galland Mercantile Laundry, San Francisco, Cal.; Brooksville (Ind.) Electric Company; Calhoun Mills, Calhoun Falls, S. C., and Durham (N. C.) Cotton Manufacturing Company, in the great Southern textile district; Pend d'Oreille Electric Company, distributing current to the mines around Sand Point, Idaho; Citizens' Electric Company, Williamsport, Pa.; Green Fuel Economizer Company, Matteawan, N. Y.; Frank H. Falls, manufacturer of plumbers' supplies at Rochester, N. Y.; City of Monroe, Wis.; Mayfield (Ky.) Water & Light Company; National Wood Pipe Company, Olympia, Wash.; Green Bay (Wis.) Paper & Fibre Company; Great Western Sugar Company, comprising four units for refineries at Ft. Collins and Eaton, Colo., and others in industries equally diversified. Steam turbine and generator sales include units for the Pfister & Vogel Leather Company, Milwaukee; Washburn-Crosby Mills, Minneapolis; Pueblo & Suburban Traction & Lighting Company, Pueblo, Colo.; municipal light plant of the city of Holland, Mich.; Winona Interurban Railway, Warsaw, Ind., and A. F. Gallun & Sons, leather manufacturers, of Milwaukee. Hydro-electric units ordered comprise three turbines, having a combined capacity of 10,800 hp for the "Olmsted" plant of the Telluride Power Company, Provo, Utah, four of 2350 hp for the Sioux Falls (S. D.) Light, Heat & Power Company; one of 1700 hp, with 150-hp exciter turbine for the Wausau (Wis.) Street Railway, one of 450-hp for the Andrews Light & Power Company, Salmon, Idaho, and an 1150-hp turbine for the Holton Power Company, Holtville, Cal. Negotiations for the gas engine-driven electrical units have also become very active of late, and in addition to the orders taken for steel mill and traction service, aggregating 107,400 hp. Among the iron, steel, coal and quarry interests are to be noted the sale of a heavy rolling mill engine to the Pittsburgh Steel Company, Pittsburg, Pa., large power-driven air compressors to the Tennessee Coal, Iron & Railway Company, Birmingham, Ala., and Casparis Stone Company, Columbus, Ohio, and four huge vertical blowing engines to the Sloss-Sheffield Iron & Steel Company and Worth Brothers Company, Coatesville, Pa. Motor-driven compressors and power transmitting machinery, including Allis-Chalmers "1908" friction clutch, are also represented by a long list of sales showing even greater diversity of industrial operations.

ADVERTISING LITERATURE

Westinghouse Traction Brake Company, Pittsburg, Pa.—This company has just issued a revised instruction pamphlet, No. T-5035, containing rules for operating the A.M.S. brake equipment for electric cars, running singly or in two-car trains, in city or slow-speed service.

Walter A. Zelnicker Supply Company, St. Louis, Mo.—This company has issued a special circular on its Zelnicker double-clutch car movers. A number of testimonial letters are printed in connection with the description of the mover. A list of the company's rail and equipment offering is also published under date of July 29.

American Spiral Pipe Works, Chicago, Ill.—Pamphlet No. 22 of this company calls attention to the many different uses for which Taylor spiral riveted pipe is especially adapted. It is illustrated with views of typical installations of large and small sizes of pipe for high pressure water lines in hydro-electric plants, city water mains, dredge outlets, refrigerating plants and engine exhaust pipes. A number of special pipe fittings are also illustrated.

W. N. Matthews & Brother, St. Louis, Mo.—This firm has issued a series of illustrated postal cards regarding its holdfast lamp guards. These cards show the various applications and give reasons for the use of the guard. The guards are valuable in power stations and shops where lamps are frequently subjected to hard usage and many bulbs are broken. The guards can be securely locked to the socket and by the use of a trap can be made thief proof. Another feature is that lamps can be removed and replaced without disturbing the guard.

Dossert & Company, Inc., New York, N. Y.—This company has just issued its fourth annual catalogue of Dossert solderless connectors, cable taps and terminals. It is complete in every respect, but concise and compact. Since its last catalog was issued, the National Electrical Code has been amended to permit the use of an approved mechanical joint without solder, and Dossert joints have been placed on the list of approved fittings. The company is constantly bringing out new designs and has added materially to its stock of standard sizes, and is now in a position to give orders proportionately better attention. The Dossert joints are said to save cable, solder, gasoline, time, labor, money, trouble and blow-outs, and to be durable, adjustable to all size cables, convenient, adaptable to all conditions, inexpensive, cheaper in quantities, economical and safe. The different types are suitably described and illustrated.

Joseph Dixon Crucible Company, Jersey City, N. J.—*Graphite* for August, issued in the interest of this company, contains the announcement that the Dixon Company has registered the word "Flake" as applied to graphite. This term was originated by the company to distinguish that form of graphite, as it comes from the mines at Ticonderoga, from the thick form such as is mined in Ceylon. The fourth chapter of W. H. Wakeman's article on "Preventing Corrosion of Steam Machinery" appears in the August issue. This particular chapter deals especially with pumps. Back numbers of this series can be supplied to all those who may desire them by writing to the Dixon Company. A view is shown of the pencil factory now in course of construction, which will add some 30,000 sq. ft. to the floor space of the factory. This represents the third addition made to the Dixon plant within less than two years. There are also articles on the care and preservation of wire rope and the care of automobiles.

General Electric Company, Schenectady, N. Y.—Several illustrated bulletins and other literature have recently been issued by this company. One bulletin, No. 4608, is on the Type H subway transformer. This transformer is watertight, properly proportioned for the limited space available in the manholes, of high efficiency and large radiating surface and with small temperature rise. These transformers are manufactured for a frequency of 60 cycles at standard voltages and in capacities of from 5 kw to 300 kw, inclusive. Another bulletin describes a series system for utilizing tungsten lamps and includes illustrations and general data on transformers, switchboards, lamp brackets and reflectors, series sockets and lightning arresters, used in connection with the system. Still another takes up the company's new line of small plant continuous-current switchboards. The company has also just issued a folder in regard to its mercury arc rectifier and the method of use in connection with moving-picture machines by which the operator can obtain direct current from an alternating-current circuit. This outfit forms a simple and compact piece of apparatus, requiring practically no more attention or adjustment than the ordinary rheostat, and will operate satisfactorily on any alternating-current voltage from 200 to 240 and any frequency from 40 cycles to 140 cycles.

ELECTRIC RAILWAY PATENTS

UNITED STATES PATENTS ISSUED AUGUST 4, 1908

[This department is conducted by Rosenbaum & Stockbridge, patent attorneys, 41 Park Row, New York.]

Car Seat, 894,811; Edward G. Budd, Philadelphia, Pa. App. filed Apr. 18, 1907. Relates to the construction of sleeping-car seats adapted to be unfolded to form a berth.

Brake Rigging, 894,853; William G. Price, New Castle, Pa. App. filed Nov. 9, 1907. Provides for the support of the brake rigging from the equalizer bars, so as to be entirely independent of the truck frame, and at the same time provides for the movement of the brake beam in a substantially horizontal plane.

Resilient Gear Connection, 894,915; Norman W. Storer, Pittsburg, Pa. App. filed Dec. 3, 1906. A resilient gear connection comprising a quill loosely surrounding the axle between the wheels and having resilient connection at one end to the adjacent wheel, a gear wheel mounted upon and fastened to the quill and having resilient connection to the other axle wheel.

Brake Block, 894,946; Herbert Frood and Daniel G. Holmes, Chapel-en-le-frith, Scotland. App. filed June 9, 1906. A composite brake shoe comprising fibrous vegetable material mixed with metallic pieces of substantial size and bound together by a suitable cementitious material, said pieces being all of a size too large and heavy to adhere to any solid object or to float in the atmosphere in the form of a dust.

Rail Bond, 894,952; Albert B. Herrick, Cleveland, Ohio. App. filed Nov. 25, 1904. Comprises a conducting element and sheets of cementing material attached to the respective terminal portions of said element, said sheets having their outer faces formed with projecting protuberances whereby the contacting area of such faces is decreased.

Electric Railway, 894,964; Joseph Mayer, Rutherford, N. J. App. filed Sept. 13, 1907. A collector shoe for electric locomotives of the type having parallel link motion, making use of an auxiliary hinged section at the top.

Rail Joint, 894,985; Owen Scanlan, New Orleans, La. App. filed July 6, 1907. A skeleton sleeve for the meeting rail ends exposing a maximum of the meeting portions of the rails to the atmosphere so as to assure as free expansion and contraction of the meeting portions as of the remainder of the rails.

Tie Plate, 894,986; Morris Sellers, Chicago, Ill. App. filed Feb. 1, 1908. The under surface of the tie plate is provided with a box rib extending all around near the edge thereof, so as to give the plate an effective grip or anchorage on the tie.

Snow Plow, 895,002; Axenti S. Cerkez, Bacau, Roumania. App. filed Sept. 25, 1906. Relates to improvements in snow plows of that type in which the snow is first carried upward upon an inclined plane and then carried sidewise or backward. The walls of the framework are constructed of a material having a low coefficient of surface friction and having a movement with the snow removed by the plow.

Electric Railroad Signal, 895,035; Arthur Wellington McMaugh and Robert Welch, St. Catherines, Ont., Can. App. filed Dec. 3, 1906. Detail features of a special collector shoe depending beneath the car and adapted to engage a continuous third-rail between the track rails.

Trolley Pole Mount, 895,070; Edwin H. Burnes, Amsterdam, N. Y. App. filed July 27, 1904. The trolley pole is hinged on a swiveled base and is maintained upright by link connections with bow springs on the base.

Rail Chair, 895,246; Herbert P. Ellerbeck, Carlton, Minn. App. filed Feb. 17, 1908. Details of construction.

Trolley Catcher, 895,251; George Gessert, Edwardsville, Ill. App. filed March 16, 1908. A pair of dome-shaped plunger springs impelled together above the trolley wheel so as to close over the trolley wire, and yield apart in passing hangers, etc.

Automatic Collapsing and Re-erecting Trolley Pole, 895,314; George Samuel Thomson, Dunedin, New Zealand. App. filed Nov. 29, 1907. The trolley pole has a supporting link which drops to allow the pole to fall by reason of undue upward movement thereof.

Trolley Guard, 895,321; Charles H. Yarrington, Waterbury, Conn. App. filed Dec. 17, 1907. A pair of pivoted arms on the trolley harp which are spring impelled to project upward, but yield in either direction in passing hangers.

Trolley, 895,339; Leon W. Campbell, Woonsocket, R. I. App. filed Jan. 4, 1907. The trolley wheel is provided with a ball bearing support of the Hesbright type.