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Of this issue of the ELECTRIC RAILWAY JOURNAL 9100 copies are printed.

The Chester Strike

The strike which was inaugurated on the lines of the Chester Traction Company during the first part of April still continues and is being accompanied by a boycott of the company's lines which has probably no parallel in the street railway annals of this country. Owing to an elaborate system of terrorism and intimidation which has been rampant during the last three months, the citizens of Chester have been reduced to a state where they are afraid to patronize the road. Not only is there danger from violence, but passengers, particularly women, seen alighting from a

car are insulted on the street. So abject is the condition to which the residents of the city have been brought that storekeepers are afraid to sell goods to those known to have patronized the cars for fear of being included in the dread anathema. The present motormen and conductors are fed and housed at the depots of the company, as it would be impossible to secure respectable and safe lodgment for them elsewhere. It seems difficult to realize that these conditions exist in America and that the city government should permit the continuance of such a state of affairs. Independent of all questions of the merits of the strike, no community can afford to countenance the existence of a reign of lawlessness. Unless the conditions which are present in Chester are soon terminated we predict that the empty cars now running on the streets of the city will be symbolic of its other industries, for none will desire to establish a home or factory where such tyranny prevails.

Steam Railroad Competition by Urban Companies

Successful competition with steam railroads in the territory of urban electric railways is mainly a matter of comparative schedule time, frequency of car service and comfort of transit facilities offered. Each system has conditions of its own in this matter, but in general the nearer the business center the more certain is the electric line of capturing the bulk of the traffic, and the farther from the downtown district one goes the more powerful becomes the competition of the steam railroad. It is very important to seek out the reason why traffic selects one route or another, in endeavoring to meet competition, and the middle ground where one line has about the same attractiveness as another deserves the most careful consideration. In the recent decision of the Massachusetts Railroad Commission limiting for the present the number of stations in the Cambridge subway to three, the ability of the Boston Elevated Railway Company to compete with the Boston & Maine steam system in its outer suburban territory will doubtless be much enhanced. A reduction in the present running time between Harvard Square and Park Street of possibly 60 or 70 per cent will enable patrons living farther out to reach their offices in the same time by trolley that many now consume in traveling as steam commuters. To the average business man time counts for more than a slight difference in fare, and the suburban electric line which can by its frequency of service or high average speed bring the passenger into the heart of the city as quickly as the steam road, taking both origin and destination into account, stands a good chance of capturing the bulk of the traffic. The greatest obstacle in most cities is the necessarily slow movement inside the thickly populated sections. Whereas in Boston the fast running suburban lines terminate at the

stations of elevated or subway routes leading to the center of the business district, and conditions are almost ideal for successful competition with local steam railroads.

Electrical Equipment Stimulates Traffic

One of the standing claims in favor of the electrical equipment of steam roads is the increase in traffic which will result from a more frequent, cleaner and better service. This argument has been made in practically every paper which has been presented before different societies and is undoubtedly based upon the results following the substitution of electricity for horses on street railways because very little is known on the actual increase of traffic when electricity has been substituted for steam. For this reason the paper presented at a recent meeting in Niagara Falls of the Association of Transportation and Car Accounting Officers, by T. Jay Tomlinson, is of great interest. It gives the results of a study of the service on electrified suburban roads, and the comparisons between steam and electric operation seem to be largely in favor of the electrically operated service.

Referring to the West Jersey & Seashore Railroad operating between Camden and Atlantic City, it is stated that in the first year of electrical operation ending with Aug. 31, 1907, as compared with the corresponding period of the previous year, there was an increase of 19.54 per cent in the strictly local traffic as shown in the ticket sales at local offices, exclusive of the terminals at Philadelphia, Camden and Atlantic City. For the year preceding this the increase due to the natural growth of traffic when operated by steam was but 1.85 per cent. It is complimentary to the electric service to find that the steam branches operated in conjunction with it show a stimulated growth in connection with the frequent electric service. On three connecting steam branches the increases over the corresponding period are approximately 11 per cent, 4 per cent and 9 per cent, respectively.

Mr. Tomlinson presents one strong argument in favor of electrification in his conclusions regarding suburban service. He says:

The financial value of suburban service largely arises from its regular daily travel, i. e., commuters, these representing the traffic which pays the cost of operation and in turn stimulating a family and visiting traffic, which represents profits. It has been computed that 60 minutes' ride represents the maximum time which daily riders will use; therefore, if a method of traction increases the distance which may be traversed within the daily ride limit, a larger territory and consequently greater traffic may be obtained.

A 65-minute ride in the electric zone will cover a distance of 30 miles, whereas with steam service the distance covered is only 24 miles, or a 25 per cent increase in territory available under electric service. The enlarged traffic zone thus obtained is from the quick acceleration of electric cars as compared with steam trains, the maximum speed necessary between stations being really less.

A study of the traffic conditions on this electrified line has shown that further development of local traffic is limited only by local building conditions. At one station a strong effort is necessary to meet the demands for houses and here the traffic has exhibited a continual monthly increase of from 25 to 45 per cent. The local interstation travel also has received a wonderful stimulus and is estimated at an increase of about 250 per cent.

Conditions have been such on the New York Central, New

Haven and Long Island Railroads that it has not yet been possible to determine what the similar gain will be upon those roads. The terminals are not yet completed and this has necessitated a retention of practically the steam schedule. The West Jersey is the other large converted road, so that traffic statistics from it are very instructive. We hope we shall have more of them.

Mercury Vapor Lamps for Railway Use

There is no apparent reason why a railway shop should not be as well lighted as any other manufacturing plant. Such, however, is not the general case, hardly is it the average. A few arc lamps scattered about where the wiring cost will be low and some portable lamps usually compose the equipment. There is no particular reason why this should be the case; in fact, every condition demands that more attention be given shop and pit lighting, if accurate work and thorough inspection are required.

We have referred to several installations of mercury vapor lamps for railway shops and power stations and their general employment in manufacturing establishments suggests the desirability of their use for this purpose.

The advantages of the mercury vapor lamps as compared with ordinary arcs and incandescents are those of power economy, low intrinsic brilliancy, lack of shadows, low upkeep and long life. To be fair to the older types of illuminating mediums, the disadvantage in the same comparison should likewise be stated. They are high first cost, large units and unsuitability where colors must be distinguished.

A mercury vapor lamp shows a power consumption of about 0.8 watt per mean spherical candle, while incandescent bulbs require about 4.2 watts measured similarly. The energy cost is then on a basis of 1 to 5, or the illuminating value is five times as great with the mercury lamps as with the incandescent for the same amount of energy. Thus we have a fair measure of illumination when large areas such as are to be lighted in railway work are considered. If a shop which is wired for arc lamps changes these lamps for those of the mercury vapor type, it is usually the practice to make the replacement lamp for lamp and thereby save the cost of rewiring. The ordinary arc lamp as used in shops requires about 2.5 watts per mean spherical candle, or more than three times the energy consumed by the mercury vapor lamp. For power houses and substations generous illumination can be supplied by the latter at an energy consumption of one watt per square foot of floor area. In shops a little more plentiful amount of light should be furnished at a slightly increased power cost.

A disadvantage which both mercury and arc lamps have as compared with incandescent bulbs is that the illuminating must be done with large units. The smallest capacity for which a 500-volt circuit of the mercury vapor tubes can be wired is for 3.5 amp. Such a circuit would have capacity to feed seven circuits of incandescent lamps. Mercury vapor lamps are made to burn across 110 volts or 55 volts, the length of the tube varying with the voltage rating. There is therefore considerable flexibility of arrangement when current is available at 500 volts pressure.

Recent types of these lamps are fitted with a magnetic device which automatically tips the tube to transfer the mercury within for the purpose of starting; formerly mercury vapor lamps were started by pulling cords which me-

chanically tilted the tubes. The magnetic tipping device places the lamp on a par with the arc or incandescent with regard to the attention required in starting up.

Light from the mercury vapor tubes is utterly devoid of the red component, so that all objects which appear red in daylight seem of a different color under the mercury vapor light. For this reason the new method of illumination is not at all suited to paint shops. For the inspection of equipment under a car, however, this quality of the mercury vapor lamp is no disadvantage, while the merits of the light for work which must be carried on within the confined space of a pit are marked. Its lower intrinsic brilliancy makes the light easier on the retina than the incandescent lamp unless the latter is provided with reflectors, a plan not always practicable with pit lights. Again, the same absence from sharply defined shadows on the under part of the car could not be secured with incandescent lamps unless the latter were so numerous that the light from them would be both costly and blinding.

The life of the mercury vapor lamp seems to be determined more by breakage than by age. Mechanical injury therefore must be guarded against and this can easily be done in pit construction. It is unnecessary where the lamps are hung from the ceiling. Recent installations of these lights have been placed in pits with recesses specially provided. The lamps also are protected from chance blows by strong wire guards.

Praise for New York Transit Facilities

On account of the peculiar arrangement of Manhattan Island and the great congestion of population, always increasing, the transportation problem in New York is more serious than that of any other city in the country. Companies and public authorities have endeavored, sometimes through coöperation and again by independent action, to solve the problems which were most pressing. No sooner have the difficulties surrounding one troublesome aspect of the situation been overcome, however, than another insistent condition has arisen to worry those who have tried to meet the transportation needs of the community. If no comprehensive arrangement whatever for carrying large multitudes of people daily had been worked out as a result of the years of effort which have passed while the city and its suburbs have developed, the public would have abundant reason for bitter complaint. But there have been created systems of lines, surface, elevated and subway, which are not equaled by the facilities in any other cities where congestion of population is so grave a civic problem as in New York.

Strangers are more likely to be impressed than the residents of New York by the facilities afforded. This fact is probably due in part to the unfortunate innate trait that prevents many people from appreciating the full benefit enjoyed from conditions which constant association has made familiar and, therefore, perhaps, commonplace. It will also be felt that there would be fuller appreciation of the value of the transit facilities that are available if it had not become fashionable for the public to abuse the corporations engaged in conducting public utilities. Testimony as to the impression produced on a noted visitor has been given recently. Sir Clifton Robinson, managing director of the London United Electric Tramways Company, made an address before the Tramways & Light Railways Association

of Great Britain on July 9 in which he said in discussing New York: "The elevated railway, the surface tramway and the underground railway, all operated electrically, provide an enormous triple system of communication, and in New York I found myself revolving, as it were, in the most comprehensive and amazing demonstration of rapid transit that the world has yet produced. Still the transportation problem grows with the city's growth and its true solution seems as far distant now as when, 40 years ago, I underwent my street railway baptism." If Sir Clifton, an experienced observer, is able to marvel at the network of lines in New York, some who have not had his training could afford to indulge in expressions of satisfaction that so much that is wonderful has been done.

Conversely, the anomaly that with these latest examples of electric railway construction the earliest means of transport are still employed on a considerable part of the New York City lines always attracts the attention of the visitor. New Yorkers are so familiar with the horse car that it makes no particular impression upon them unless they are returning to the city after a long absence. The original purpose of the authorities in New York in forbidding overhead wires may have had some logic. Fifteen years ago the art was nowhere near so advanced as at present, the defects and expense of the conduit system were not realized as they are now, and there were other substitutes whose claims were being advocated by inventors. The last decade and a half have brought these motive powers no nearer commercial success, indeed they seem further off than in 1893. Chicago and San Francisco are becoming emancipated from cable and horse power, but New York is still lagging behind, to the detriment of its own interests and the surprise of residents elsewhere.

While the difficulties of providing for the transportation needs of a large population are more acute in the great cities than in the municipalities of medium size, study and knowledge of these difficulties on the part of the public and its representatives in office in every locality would lead to some understanding of the trying conditions under which managers of all electric railways operate. If thinking people would reflect, they would realize that the problem of improving the transportation facilities of a large city is different from that which is presented, for instance, to a manufacturing company. The transportation company must continue to operate its cars under all conditions. If additions to its plant or equipment are required it must not suspend operations while improvements are under way. It cannot, like the manufacturer, close its plant for a thorough overhauling. It cannot even stop when business is reduced so much that profits vanish.

Conditions of operation in New York City are different from those which exist in any other municipality in the country. The congestion is greater, and the possibilities for utilization of thoroughfares are fewer. If Manhattan Island had only been planned with a view to the congestion of this day, its founders would no doubt have laid out the streets in a different manner. The situation, however, must be met as it is, not as it might have been, and the railways need not only the coöperation, but also the encouragement of the authorities and the public in their endeavors to cope with the situation.

THE FOREST HILLS EXTENSION OF THE BOSTON ELEVATED RAILWAY

The Boston Elevated Railway Company has recently erected a 2½-mile extension of its elevated structure from Guild Street, Roxbury, to Forest Hills, to be operated in connection with the train service later to be established in the Washington Street tunnel. This extension will provide

with regard to additional stations until the train service has been in operation long enough to show what is needed.

The new line is characterized by very moderate grades and by curves of large radius to obtain the speed possibilities of the equipment. It follows Washington Street throughout its entire course, and is a double-track plate girder structure. The maximum grade on the line is 1.85 per cent. The steel spans vary in length from 44 ft. to



Forest Hills Extension, Boston Elevated Railway—General View of Eggleston Square Station from Columbus Avenue

rapid transit between a large suburban district at present served by the steam trains of the New York, New Haven & Hartford Railroad and the surface car system of the Boston Elevated in conjunction with the existing elevated line to the Dudley Street terminal. In the construction of the new line the company has followed the original plan of establishing comparatively few elevated stations in the territory between the business district of Boston and the distant suburban distributing points, leaving this intermediate

62 ft. The general type of structure is deck construction, with plate cross and longitudinal girders, the through girder construction used at stations and other special places not amounting to over 5 per cent of the whole. The structure was erected by the usual traveler method, the traveler advancing on each span as fast as it was built and picking up the steel for the succeeding spans from the ground alongside the route, where it was laid in order for erection sufficiently in advance to enable a full night's work to be done.



Forest Hills Extension of the Boston Elevated Railway—View of Both Platforms at Eggleston Square Station Under Construction

service to the surface cars, and distributing and collecting the elevated trunk line traffic by universal free transfers. To this end but one station has been provided between Dudley Street and Forest Hills. This is located at Eggleston Square, about 1¼ miles from each end of the extension. Other stations may be required in time, but in deciding this problem the Railroad Commission has reserved its decision

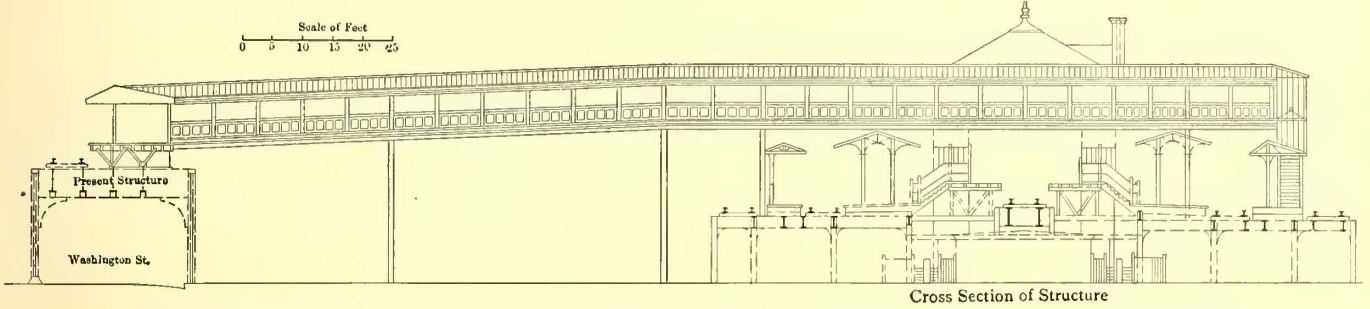
The steel thus far erected has been supplied by the Penney Iron Works.

In crossing the Arborway it was necessary to provide for special ornamentation in the structure, since the latter is part of the park system of the city of Boston. This part of the line will be carried upon single posts encased in concrete, the structure itself also being sheathed with masonry.

These posts were illustrated on page 1205 of the STREET RAILWAY JOURNAL of Dec. 28, 1907. They are of very massive design as planned and are to be supported on special foundations 11 ft. 6 in. square, extending to a maximum depth of 12 ft. The posts are of octagonal cross-section horizontally, and will be tied into the foundation by four anchor bolts. The foundation will be in two courses, the

tically and horizontally in the concrete. The piers are 10 ft. x 4 ft. long and 8 ft. x 6 ft. wide at their bottoms.

The timber work throughout the Forest Hills extension is of hard pine, including ties, guard rail and feeder box. The latter is located between the tracks as in the first structure built in Boston. The ties are 8 ft. 6 in. long and

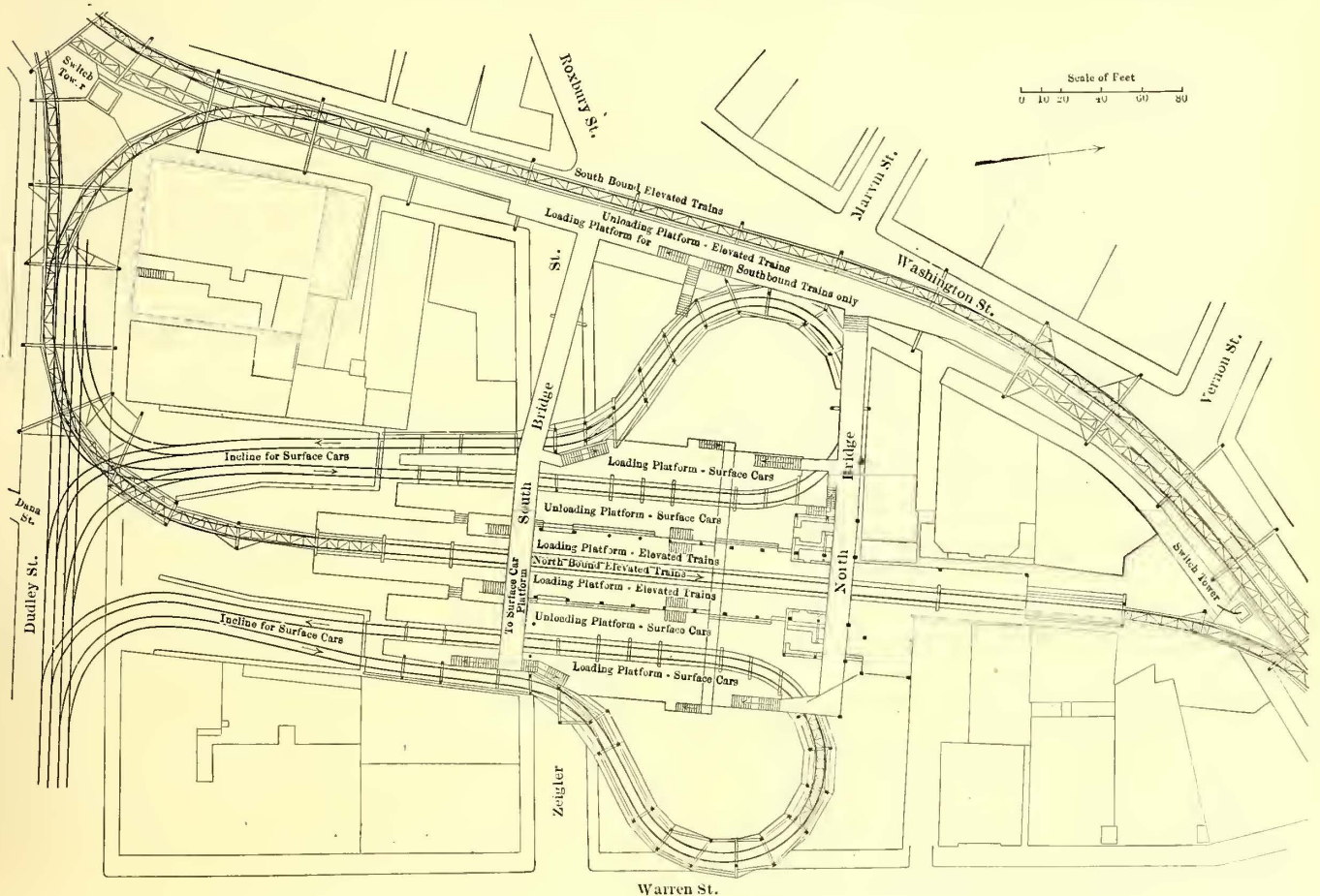


Forest Hills Extension of the Boston Elevated Railway—Cross-Section of Dudley Street Station

top one being provided with a batter leading to a bottom width of 18 ft., and the lower course being 24 in. deep and 24 ft. long, and reinforced at the ends on each side by 14 rods 1 1/8 in. in diameter and 5 ft. long. The rods are spaced 12 in. centers. The two courses are each 15 ft. wide at the bottoms. In crossing Stony Brook, near Forest Hills

6 1/2 in. x 8 in. in section. The track is built of 85-lb. rails containing the following: Carbon 0.5 to 0.6 per cent; manganese, 0.9 to 1.1 per cent; sulphur, not over 0.1 per cent; silicon, 0.1 to 0.2 per cent; and phosphorus, not over 0.1 per cent.

The third-rail is between the tracks, is mounted on An-



Forest Hills Extension of the Boston Elevated Railway—Plan of the Dudley Street Station

Square, it was necessary to provide a foundation directly over the brook for one of the posts at the end of a bent. This foundation is to be built in two courses extending to a depth of about 10.5 ft. The pedestal rests upon five 15-in. I-beams, with a span of 9 ft. over the brook, the beams being carried at each end by reinforced concrete piers. The main reinforcement consists of 1-in. rods placed both ver-

dered Aetna insulators and set 11 1/2 in. above the tie and 19 1/8 in. from the inside of the head of the nearest track rail. The feeder box is covered with planking 2 ft. 10 in. wide provided with a guard so it can be used as a walkway. Goldie spikes are used mainly, although some screw spikes are being tried on the work. Goldie tie plates also are employed. The switches thus far installed are of Ramapo type.

A special feature constituting an improvement over the original Boston elevated structure is the use of wooden cleats under the ties to lock them from lateral motion across the angle irons at the sides of the longitudinal girders. The old method was to notch or slot the ties and allow them to rest directly upon the angle irons, permitting the shoulder in the tie to carry all end thrust. By the new method the expense and delay of notching ties are avoided, and the ties can be changed with greater speed after the road is in operation. The tracks are spaced 12 ft. apart on centers. To obstruct the street as little as possible the posts of each bent are located at the edge of the sidewalk, giving a width in typical construction of about 45 ft. The rails on the typical section are 24 ft. above the street level.

STATION CHANGES

In connection with the extension several important changes have been made necessary in the Dudley Street terminal to provide for the expeditious handling of through traffic to and from Forest Hills and train service terminating at Dudley Street. The plan to be followed in the arrangement of the station is reproduced herewith. All stations on the elevated division will have platforms 350 ft. long for eight-car trains. The original platforms in Boston permitted no more than five cars per train. At Dudley Street the present loop track from the elevated structure on Washington Street will be retained, so that, if desired, trains from the city can be turned back at this point. All outward bound trains will make a stop at a platform to be built on Washington Street at the west of the present terminal property. This platform will be used as a loading platform for Forest Hills trains and as an unloading platform for trains from Boston. It will be connected with the rest of the terminal by two overhead passages 12 ft. wide. The equivalent of six platforms will be provided in the central portion of the terminal. The present surface car inclines and loops will be retained, but in the formerly unused space on the inner side of each surface-car loop at the elevated level a loading platform will be provided for passengers desiring to take these cars. These loading platforms for surface cars will be about 20 ft. wide and will be connected with the bridges from the elevated unloading platform previously mentioned. A subway foot passage or mezzanine walk will enable the passengers to cross from either side, between the east and west surface-car loops.

On the side of each surface loop nearest the center of the terminal will be the unloading platform for surface cars as at present, and adjoining these will be the loading platforms for in-bound elevated trains as at present. The surface cars that traverse the loops will need to make but one stop. The plan of discharging passengers on one side and receiving them on the other will undoubtedly tend to shorten the stopping period and thus increase the capacity of the terminal for surface car movements. Passengers inward-bound to Boston on surface cars that ascend the inclines can transfer directly across the two inner platforms to their desired elevated train, with a walk of less than 40 ft. Similarly the outward-bound traffic from the elevated trains will proceed directly across the bridges to the surface car loading platforms, involving an average walk of about 250 ft. on the west-bound side and about 150 ft. more on the easterly side. Connection is provided in the plan for passengers wishing to go between the street and the unloading elevated platform, and the existing stairways between the elevated loading platform and the surface level are not to be altered.

In the construction of the Eggleston Square station the company has designed the platforms, galleries and stair landings for reinforced concrete. This is the first station in the Boston system to be designed with this material, and one of the first in the country. At its widest point the station platform is 12 ft. 8 in. wide, with a 4-in. safety tread between the edge of the platform and the car sills. The thickness of the platform is 4 in., the construction consisting of a 3-in. concrete slab surmounted with a granolithic finish 1 in. thick carried on I-beams. The main reinforcement for the slabs is composed of Clinton welded fabric 3 in. x 10 in. mesh, No. 4 to No. 10 wire. Above the beams and channels an auxiliary reinforcement of the same character is installed, and between the channels reinforcements of No. 2 to No. 14 galvanized netting are used. The reinforcement extends both longitudinally and transversely.

The Forest Hills station will be located in Forest Hills Square about 100 ft. beyond the Arborway. This is to be a two-platform station, with escalators and stairways connecting with the street level below. Outward-bound elevated trains will stop at the westerly platform, which is to be 20 ft. wide and exclusively for outward-bound travel. South of this platform will be located a double crossover by which the trains can be reversed and run back to the elevated loading platform. The loading platform is 30 ft. wide to allow for the short waits for elevated trains which will not be experienced on the west bound side. The track layout at the surface level provides for connection with separate loading and unloading platforms below the elevated platforms, with crossovers to facilitate surface traffic. By the arrangement to be adopted the surface cars from the north can, if desired, be switched to the unloading surface platform as readily as those from the south, and all cars can be both loaded and unloaded without difficulty by using the appropriate crossovers. Each of the surface platforms will be about 15 ft. wide.

The Forest Hills extension is being directed by George A. Kimball, chief engineer of elevated and subway construction, through whose courtesy the foregoing description has been prepared.

BEARING METALS FOR HEAVY RAILWAY SERVICE

The following bearing composition formulas gleaned from the records of some of the important electric and steam railroads of this country give a clear idea of the great diversity of practice on this important subject. The formulas given apply generally to bearings used both for journals and motors, but in some cases a different composition is used for the latter:

JOURNAL AND ARMATURE BEARINGS

No.	Copper.	Tin.	Lead.	Antimony.	Zinc.	Nickel.	Phosphorus.
No. 1....	7	85	..	7	..	I	..
No. 2....	75-78	7-8	10-14	..	Up to 2.4	..	..
No. 3....	80	10	10	..	..	..	.8
No. 4....	..	5	85	10	..	..	..
No. 5....	62-68	4-6	28-32	..	..	..	..
No. 6....	77	10	13	..	..	..	..
JOURNAL BEARINGS							
No. 7....	77	8	15	..	..	..	Trace
No. 8....	80	5	15	..	..	..	..
No. 9....	7	85	..	7	..	I	..
No. 10....	2	90	..	8	..	..	..
No. 11....	76	4	16	..	4	..	..
No. 12....	79.7	10.1	9.5	..	..	..	.8
ARMATURE BEARINGS							
No. 13....	84	12	5	..	Up to 2.4	..	..
No. 14....	8	1/3	83 1/3	..	8 1/3	..	..

THE POWER SYSTEM OF THE GEORGIA RAILWAY & ELECTRIC COMPANY

The electric railway, lighting, power and steam-heating service of the city of Atlanta, Ga., is furnished by the Georgia Railway & Electric Company, one of the largest organizations of its kind in the South. This company also owns the Atlanta Gas Light Company, which supplies all gas for light, heat and cooking purposes. The power system of this company is unique on account of the flexibility of the supply, and the use of steam, gas and water power in the generation of electricity for the city's needs. Atlanta has a population of about 120,000, and is thoroughly progressive in the use of electric service of all kinds. The street railway service covers about 175 miles of track, with about 250 cars, in the city proper, and outside Atlanta the single-phase line between Atlanta and Marietta (the Atlanta Northern) was practically the first application of this character to be made in the South. The latter road was described in the *STREET RAILWAY JOURNAL* of Sept. 16, 1905.

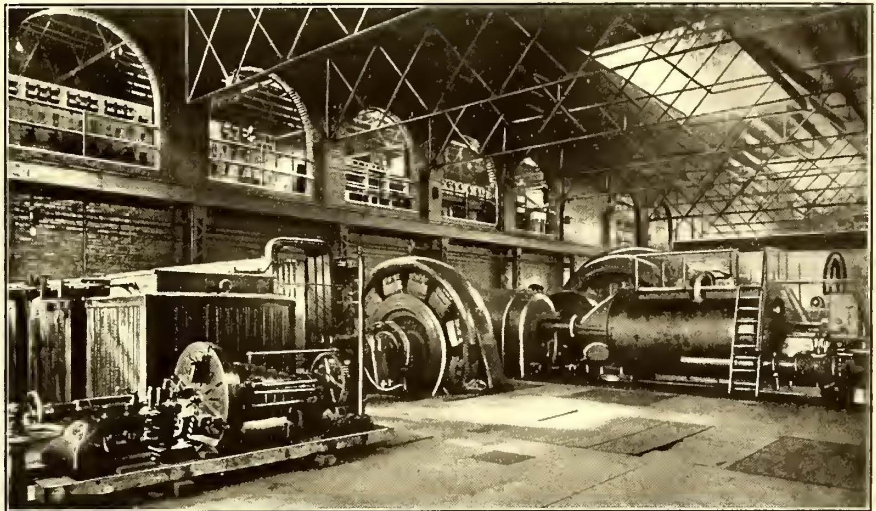
The Georgia Company's system consists of two steam generating plants at Davis and Butler Streets and three substations, located respectively at Thurmond Street, Alabama Street and East Point, with suitable tie lines and distributing circuits for the different kinds of service used in the city. These services include Edison lighting in the business center, 600-volt trolley supply, and 2300-volt lines for commercial lighting, power and arc service. Current from the water-power station of the Atlanta Water & Electric Power Company on the Chattahoochee River is delivered at the Thurmond Street substation in the outskirts of Atlanta, and near the Davis Street steam plant at 22,000 volts. At the Chattahoochee River plant 14,000 hp are generated by 150-kw turbine units operating under 48-ft. head, with Westinghouse generators. The two steam plants of the Georgia Company in Atlanta are of a combined capacity of about 13,250 kw and are operated ordinarily on any excess of the load that cannot be carried by the water power service, also serving as reserves in case of any interruption of the water power. The Butler Street plant supplies the trolley service in central business districts, including the steam-heating load of the company, with tie line connections to the substation at Alabama Street. The latter substation takes care of the Edison lighting service. The Davis Street plant is the distributing center for the a.c. service of the system, lighting and power, and the East Point substation handles the street railway load in the extreme southern part of the city and is the company's latest example of substation design.

DAVIS STREET STATION

The Davis Street station receives current from Thurmond Street at 6600 volts, the reduction being made in transformers located in the latter place. The two plants are only about 100 yd. apart. The boiler room of the Davis Street plant contains 12 B & W units, eight of which are of 250 rated hp, and four 320 hp, or an aggregate of 3280 hp. The operating steam pressure is 165 lb., and ordinarily eight of the boilers are in service, the others being either held in reserve or withdrawn for cleaning. The fuel used is

Brushy mountain run-of-mine coal, which is delivered by gravity into a bin of 3250 tons capacity and hand fired into the furnaces. Ashes are handled by an overhead trolley bucket. One of the boilers is equipped with a Parsons automatic steam blower. The feed-water supply comes either from the city mains or from a pond near the station. A permanent weighing tank is provided on platform scales in the boiler room so that either hot or cold feed water can be weighed as desired.

The engine units at Davis Street consist of a McIntosh & Seymour tandem compound engine, direct connected to a 600-kw GE 550-volt d.c. generator; Greene cross-compound engine belted to a 600-kw, 2300-volt GE alternator; two Rice & Sargent cross-compound engines, each direct connected to a 1000-kw, 2300-volt alternator; a 2000-kw, 2300-volt Westinghouse-Parsons turbo-generator and a 3000-hp Snow gas engine direct connected to a 6600-volt GE generator. The latter unit is operated by illuminating gas from the city mains and occupies a floor space of 45 ft. x 101 ft. The jacket water and the cooling water for pistons, rods and valves are supplied from the pond near the plant by a centrifugal pump having a capacity of 125,000 gal. per hour. The steam engine and turbo-units are all provided with atmospheric exhaust connections, but they



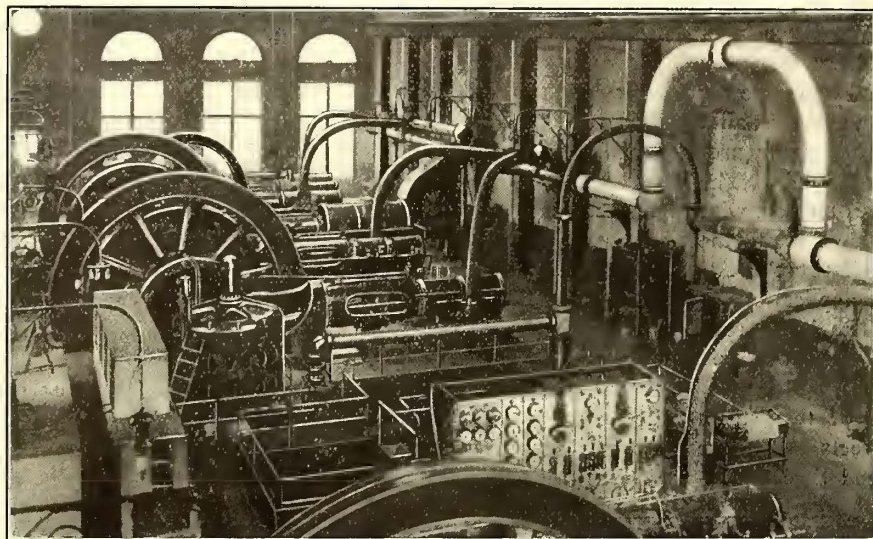
Atlanta Power System—Interior of Davis Street Station

are ordinarily operated condensing, the latter function being performed by a Worthington barometric outfit operated in connection with a cooling tower made by installing brush upon slatted floors in a timber frame tower. A sluice and overflow are provided to keep the pond free from oil. A general view of the engine room is shown herewith, with the steam turbine set in the right center. The switchboard of the plant is located in an annex of the main structure on the second floor. There are 22 panels devoted to commercial power and lighting service, including the alternating-current generators previously mentioned, and a second board near the first for the water-power service. The latter is supplied at 25 cycles and the alternators in the station are all 60-cycle machines except the gas-engine unit, which is 25 cycle. To enable the two services to be mutually supplementary a 900-hp frequency changer has been installed in the Davis Street plant. The relations of the equipment in the different stations and substations will be considered later.

BUTLER STREET STATION

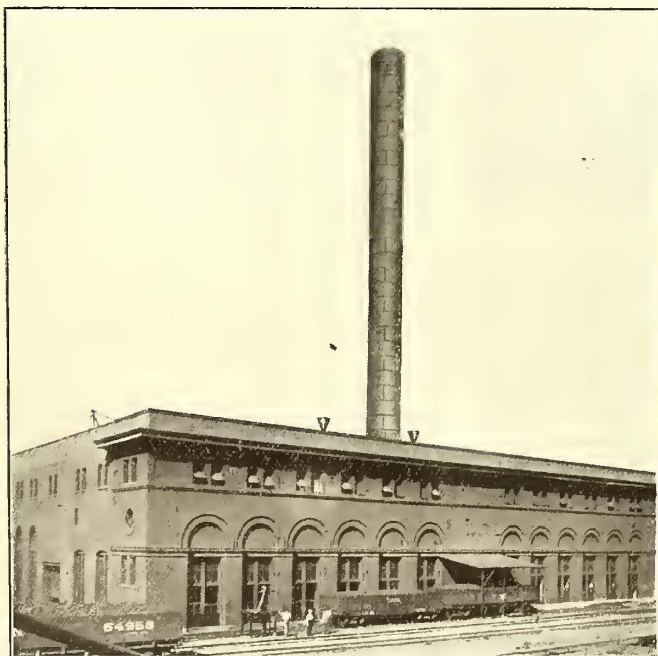
The Butler Street station has 12 400-hp B & W boilers and four 604-hp units of the same make, all of which are equipped with Jones underfeed stokers,

with motor-driven blowers. There are now two stacks at this plant, one being of steel, 11 ft. in diameter and 200 ft. high, and the other of reinforced concrete, 10 ft. 6 in. in diameter and 150 ft. high, built by the American Chimney Company, of Atlanta. The coal supply in this station is carried overhead by conveyors and distributed to the spouts of the stokers as required. In this plant the



Atlanta Power System—Interior of Butler Street Station

feedwater is supplied from the city mains and heated by a Webster 2000-hp open unit. Three feed pumps are provided in the plant. The boilers deliver steam into a header varying in size from 12 in. to 20 in. and the generating units are supplied by pipes varying in diameter from 8 in. to 12 in. The engine units include one 500-kw, 575-volt



Atlanta Power System—Butler Street Power Station and Boiler Room

Westinghouse d.c. railway generator driven by an 850-hp Greene-Wheelock engine, two 1500-kw Westinghouse railway generators driven each by a 2250-hp Greene-Wheelock engine and two 525-kw, 220-volt Westinghouse d.c. generators and also in addition a 2000-kw, 6600-volt Curtis turbine, three-phase, 25 cycles. The condensing outfit consists of two condensers of the barometric type, and five cooling

towers which are equipped with fans and motors for cooling the condenser water. Two of the larger units are operated condensing while the other four are simple engines and are used for supplying the heating system with exhaust steam. Two 2400-hp Green economizers are used in addition to the feed-water heater. The two 250-volt generators can be operated in series on the railway load if desired.

At all the stations and substations except Thurmond Street rotary converters are installed in connection with the generating units and their convenient operation with or without the water-power service.

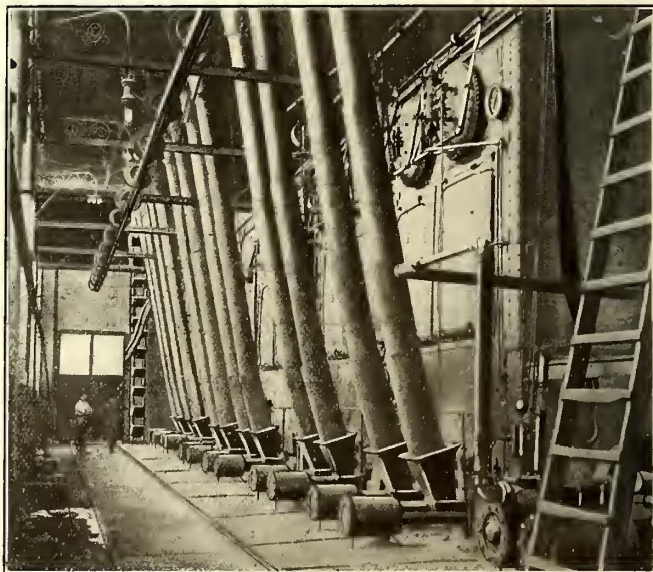
EAST POINT SUBSTATION

The East Point substation is a brick structure used as a combined electric express station and substation. It contains one 500-kw, direct-current switchboard and a 500-kw General Electric rotary giving 600 volts on the d.c. side, the current being supplied through three 185-kw transformers. The line potential entering the substation is 6600 volts, and one transformer of 185-kw rating is provided as a reserve in this station. As the substation is in a residential section of the city, its design was carried out with the idea

of making it an attractive building, and the accompanying photograph shows the architectural effect of the structure. The operating room housing the rotary is about 40 ft. x 36 ft. and the roof is made of concrete beams. A view of the interior of this substation is shown.

TIE-IN LINES

The diagram on page 429 showing the interconnections of the different stations illustrates the flexibility of the system in meeting regular and emergency conditions of



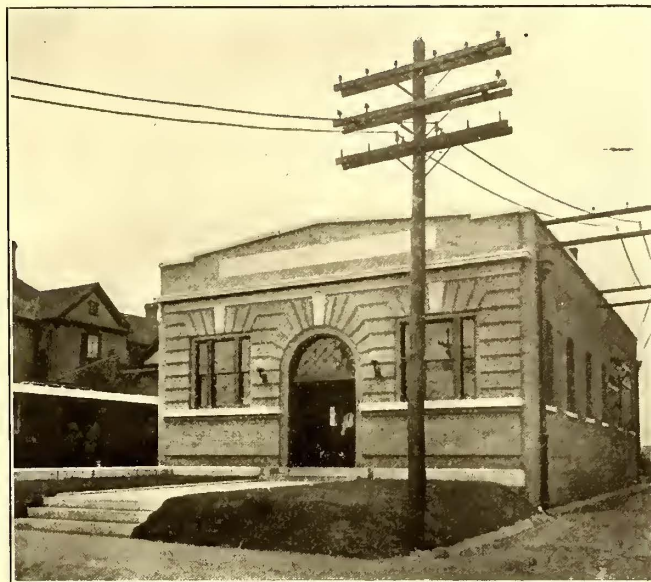
service. From the Thurmond Street substation one 22,000-volt, three-phase line is run to supply the substations of the Atlanta Northern Railway. Two 22,000-volt lines enter the Thurmond Street substation from the water-power plant, and the Atlanta Northern line can be connected with either transmission line, the interurban transmission circuit passing through the Davis Street station en route.

The maximum load on the water-power transmission line is 6650 kw, the power being on ordinarily 24 hours a day. The machinery in the Davis Street station is usually run from 5 p. m. to 11 p. m. The 60-cycle alternators take the peak of the load on the commercial circuits of the company and the gas engine is operated two hours per day usually to help out on the 25-cycle service for railway power. In the Davis Street station are two sets of 6600-volt busbars with three tie lines to the Alabama Street station, all three-phase. One of the tie lines can be used for 2300-volt service between stations if desired. The water-power service is 25-cycle current. Two sets of 2300-volt busbars are in service in the Davis Street plant. These are directly connected to the various feeder circuits for alternating power and lighting service, and three tie lines are provided to Alabama Street, one line having been referred to above in connection with the alternative use of 6600 volts or 2300 volts upon it. The two systems of different frequency are tied together by the motor-generator set of 900 hp mentioned before.

The gas engine on the 25-cycle system can be used to help out either the Atlanta Northern Railway in case of trouble on the water-power system, the direct-current railway service from Davis Street, through step-down transformers and rotaries, or the Alabama and Butler Street plants. The East Point line from Davis Street is directly tied into the busbars, through switches of the Davis Street plant, so that the gas engine also enables assistance to be given to this part of the city in case of need. When helping out the Alabama Street substation the gas engine can be used to supply power indirectly to the Edison service through 25-cycle rotaries and step-down transformers. Two 6600-volt, three-phase lines and one 115-230-volt line connect the Alabama and the Butler Street stations. The railway service from Davis Street can also be assisted by the 2300-

the alternating power and lighting service, the railway load on Davis Street or the transmission line to the Atlanta Northern Railway. It can also be used to supplement the power supply to the Alabama Street station through either the 2300 or the 6600-volt lines.

At Butler Street the generators or the turbine can be connected to the interstation tie lines so as to help out prac-



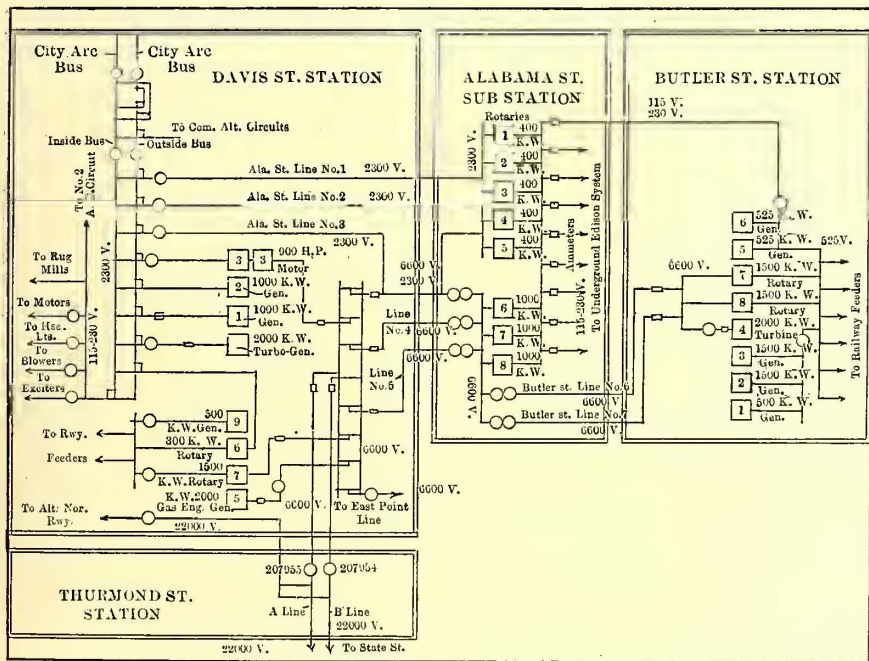
Atlanta Power System—East Point Substation

tically any part of the system. This may be done directly on the underground 230-115-volt service or through the 6600-volt service. When helping out through the low tension service from the generators in the Butler Street plant, no rotaries are required, but if the turbine is used for this

purpose the supplementary power has to pass through the 1500-kw rotary converters at the station. These rotaries are operated inverted in case it is necessary for the engine-driven generators at this station to help out the 6600-volt service either for the benefit of the Alabama Street substation or the Davis Street plant.

Recording wattmeters are placed in the various tie line and feeder circuits so that the proper amount of energy can be assigned to each station and substation in figuring up the service of each over any given period. At the Alabama Street substation a storage battery is in service on the Edison busbars. The whole system is so tied together that any ordinary conceivable interruption of service on any part means only a temporary cessation of the supply, since it is possible at short notice to bring power into the affected section, insuring the permanence of the supply

under a wide variety of conditions. From the railway standpoint the power service is not likely to be entirely shut down, since all the engine and turbine-generating equipment on the system can be massed in support of any section that may be short of power, through the necessary rotaries, transformers and tie lines. The interconnection of all stations and substations enables the machinery to be



Atlanta Power System—Diagram of Metering Connections to All Stations

volt generators in that station, through a 300-kw rotary, shown on the diagram, and a d.c. railway generator has previously been mentioned in that connection. Through the motor generator frequency changer set the water power, the gas engine and the Butler Street station can assist the 2300-volt lighting and power service at Davis Street. The turbine in the Davis Street plant can be used to help out

operated with the maximum efficiency as long as no trouble exists on the system, with transferred and shared loads as occasion demands.

In the case of trouble arising it may be necessary to operate at a lower efficiency than as though all the equipment were in service condition, but experience has shown that it is better to be able to supply continuous service in times of emergency than to shut down in the interests of economy of power production. When machinery of different frequency is employed to help out apparatus in remote stations, involving losses in transformers, frequency changers and rotaries, it is out of the question to expect the highest efficiency of distribution, but the permanence of the power supply is an asset of so great importance that the excess cost of supplying any given section is not to be weighed against the ability to give continuous service. The Atlanta system serves such varied purposes that its equipment is necessarily diverse, but in tying it into a comprehensive organization of modern apparatus capable of assisting any given service the officers of the company have made the most of a large opportunity to solve a complex engineering problem in a broad and far-sighted manner.

TROLLEY POLE TURNING TROUGH AT LOS ANGELES, CALIFORNIA

The terminal station building of the Pacific Electric Railway and the Los Angeles Interurban Railway, at Fifth and Main Streets, Los Angeles, is a 12-story structure owned by the electric railway interests. The first floor is devoted solely to an interurban terminal station with a train shed, waiting room, ticket offices, excursion offices, restaurant, express office and offices for the occupancy of the division superintendents.

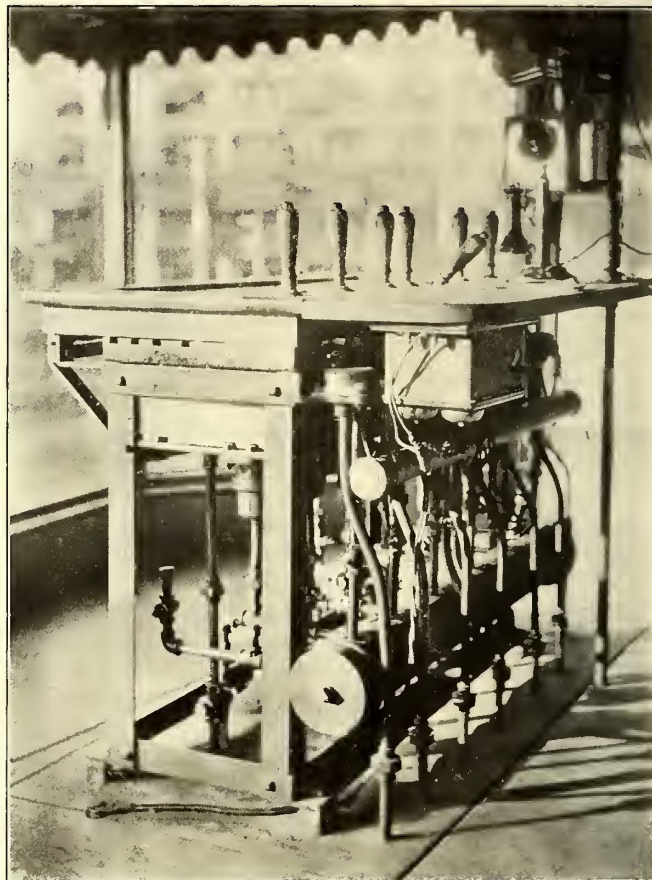
The two interurban railway systems centering at this station include 550 miles of track radiating from Los Angeles.



Interior of Pacific Electric Terminal, Showing Trolley "Y"

There are operated in and out of the station about 500 regular cars each day, which number, on some days when there are specials and excursions, is increased to a total of 800 cars, to be handled in and out of a terminal with but two tracks. During the busy part of the day the cars enter and leave the terminal on a one-minute headway.

The accompanying cuts illustrate the interior of the train shed and the interior of the switchman's tower, the apparatus in which controls the switches in the streets approaching the entrance to the terminal station. Between 5 and 6 p. m. about 200 movements of this interlocker are required. Semaphore blades mounted on poles at the street



Signal Tower at Pacific Electric Railway Terminal

corner serve to advise the motormen of the switch movements.

Referring to the view of the interior of the Los Angeles terminal, there will be noted a special arrangement of trolley troughs supported from the concrete girders spanning the tracks and supporting the floors above. The side clearance in the station is so small that there is hardly room for a trolley pole to be turned. For this reason and the obvious object of saving time, an automatic trolley-pole turning "Y" was erected. This "Y" comprises a wooden trough, under which the trolley wire is supported by bridge hangers. The "Y" is so curved that when a car enters the station on one track and takes the crossover to leave on the outgoing track, the trolley is constrained to follow the wire in the Y-shaped trough and turn itself end for end. Thus in changing ends the only work required of the conductor is to fasten and unfasten the rope. The simplicity of this ingenious trolley-pole turning scheme is easily noted by reference to the illustrations.

The York (Pa.) Railways will practically rebuild the road between York and Windsor, a distance of about 11 miles. The purpose is to reduce the ruling grade from 7 per cent to 3 per cent and taking out the sharper curves. The changes to be made will involve an expenditure of about \$120,000.

ALL-STEEL SPRINKLER OF THE CHICAGO CITY RAILWAY

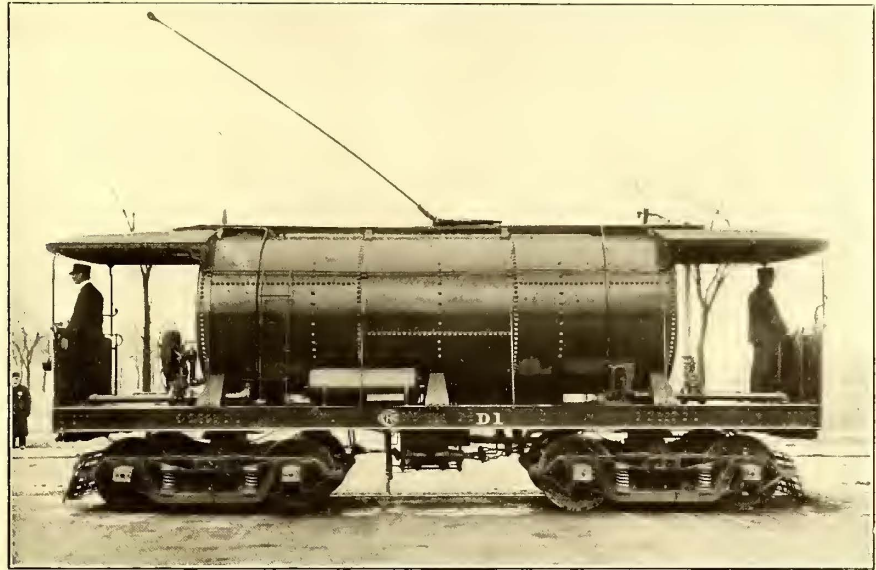
The shops of the Chicago City Railway Company are just completing an order of 12 steel sprinkling cars, five of which are now in service. Accompanying illustrations show the general dimensions and the appearance of these new cars. The sprinklers complete, with the exception of the motors, brakes and tanks, are being built at the company's shops.

Each car includes a heavy steel underframe, the dimensions of which are exhibited. Resting on this frame are three cast steel saddles supporting the tank. Two of these saddles are directly over body bolsters and the third is midway between. The water tank is 6 ft. 3½ in. in diameter and is built up of ¼-in. plates. It has surge plates riveted within. The tank has a capacity of 4000 U. S. gallons. A running board along the top of the tank, 10 ft. 9 in. above the rails, carries the trolley base in the center. The underframing of the car is 29 ft. 6 in. long and the tank 18 ft. 9 in. long, so that there is ample platform space at either end of the car. The accompanying illustration will serve to show the location of the sprinkler heads and the arrangement of the discharge pipes and valves.

At the height at which this tank is mounted a head is obtained sufficient to distribute water over a width of 17 ft.

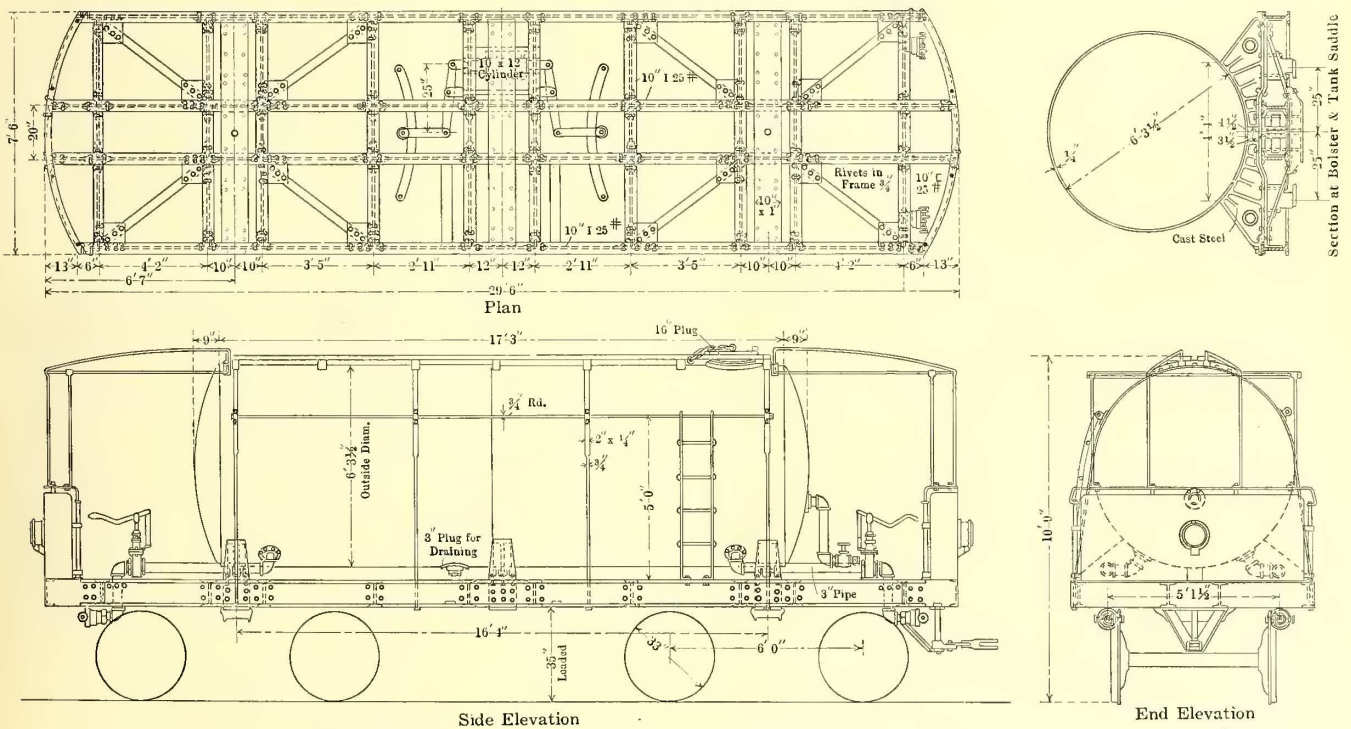
water can be thrown for 40 minutes. This length of time is ample for the sprinkler to cover the longer car routes and therefore it is not necessary to block a line of cars or side-track while the sprinkler is being filled.

The motors and control equipment and the auxiliary fittings, together with the braking and sanding apparatus, are



Chicago All-Steel Sprinkler in Service

those adopted as standard for the Chicago City Railway Company's latest passenger cars. The sprinklers are mounted on two M. C. B. type trucks with 6-ft. wheel base, 5½-in. axles and 4¼-in. x 8-in. journals. Its motor equip-



Plan, Elevations and Section of Chicago All-Steel Sprinkler

This width of throw from the gravity head is ample for the purposes desired and therefore auxiliary pressure, which is sometimes obtained by the use of special pumps or compressed air, was not required.

With the usual city water pressure it takes about 16 minutes to fill the tank and with the discharge valves wide open

ment includes four GE-80 motors with double-end platform control. The air-brake equipment has a 10-in. x 12-in. cylinder. All the wiring is enclosed in conduit with watertight junction boxes. It is stated that as great care has been used in constructing one of these cars as in building a passenger equipment.

IMPROVED COMMUTATOR SLOTTER

A master mechanic on a large Western railway recently devised a commutator slotter suitable for commutators of any diameter. The general appearance of this machine will be noted in Fig. 1 and some of its construction details in Fig. 2, while Fig. 3 shows the machine in operation. The working parts are constructed mainly of wrought iron, but brass bushings are used for the saw spindle; the standard or armature support is constructed of two $\frac{3}{4}$ -in. wrought-iron forgings held together by $\frac{1}{2}$ -in. rods running through $\frac{3}{4}$ -in. gas pipes. This gives the whole machine a strong yet light appearance after the saw has been swung clear of the center.

The armature first is brought to the stand by a chain hoist. The wrought-iron yoke which carries the centers for the armature shaft and machine proper is now swung into position to bring the saw in line with the center of the commutator. The centers are then tightened on the end of the armature shaft to insure rigidity. The spindle is connected to a belted, grooved pulley running 1500 r.p.m. and has a $\frac{3}{4}$ -in. diameter circular saw. The latter is held in position by a nut at the end of the shaft so that worn saws may be easily replaced. Adjustment for different sizes of commutators is obtained through a hand screw below the centering frame, which raises or lowers the saw shaft to the proper position and depth of cut, as checked by a thumb screw.

The hand wheel at the side is for adjusting the saw when segments of the commutator are not in line with its shaft center. After this adjustment the workman slots the commutator by pushing the lever toward the armature and moving the sliding carriage which supports the spindle for the saw. The saw runs clockwise facing the front of the machine, as shown in Fig. 3.

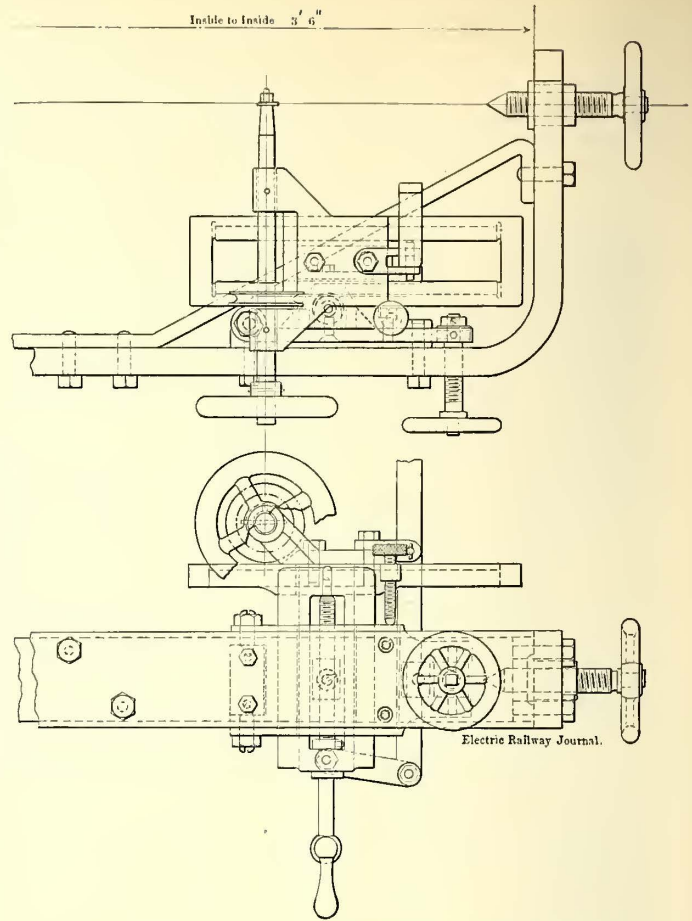


Fig. 2.—Commutator Slotter—Construction Details

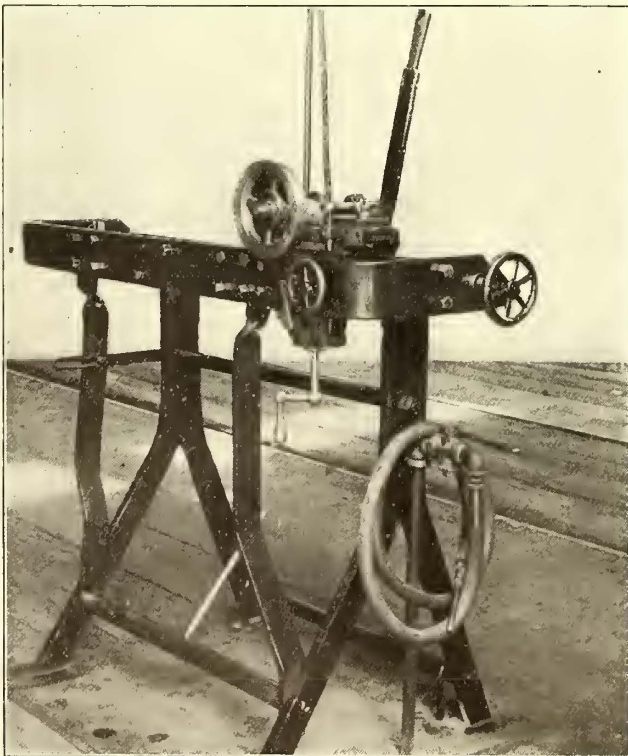


Fig. 1.—Commutator Slotter with Stand and Air Hose

With this device the commutator slots of a Westinghouse 38-B motor, which has 135 commutator segments, can be cut $\frac{3}{32}$ in. deep in from 10 to 25 minutes, according to the

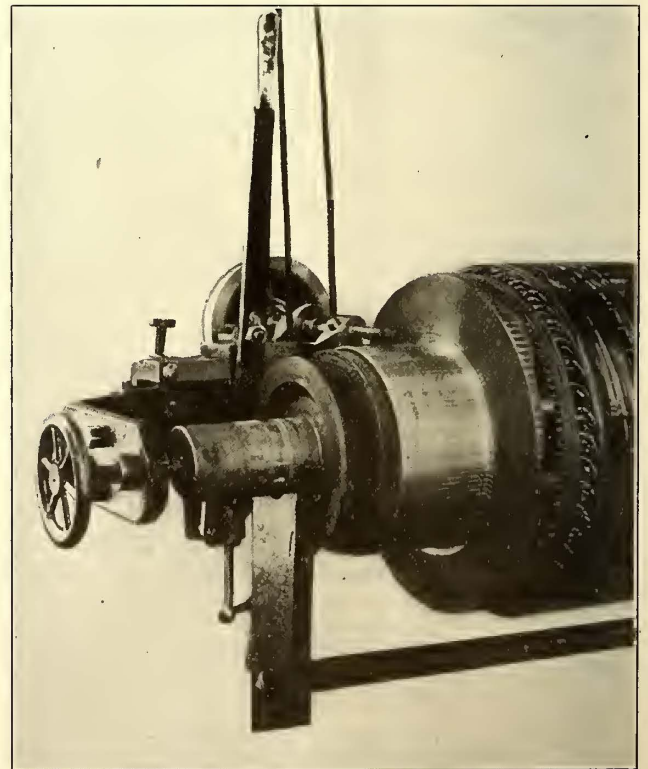


Fig. 3.—Commutator Slotter in Action

hardness of the mica. The hose shown in Fig. 1 conveys compressed air to keep the commutator clean and free from mica dust.

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

The property of the Cleveland Electric Railway Company was leased to the corporation entitled the Municipal Traction Company on April 27, 1908. On that same date the City Council of Cleveland passed an ordinance granting rights to the Cleveland Electric Railway Company for 25 years. The passage of the "Security" franchise, as it is called, and the terms of the lease, are more interesting when they are considered in the light of some of the events that preceded the completion of that part of the program. During the valuation proceedings F. H. Goff, the arbitrator on behalf of the Cleveland Electric Railway, insisted that the company must have a security franchise because the Municipal Traction Company was irresponsible financially, the argument being that if the Municipal Traction Company should default under the terms of the proposed lease of the property it could not be held for damages and there should be some plain guarantee to the stockholders that they would have rights entitled to recognition. The inference is reasonably logical that the stockholders of the Cleveland Railway Company must ascertain at all times that the terms of the lease are observed by the operating company.

In consideration of the lease several matters are entitled to special mention. These are subjects that relate rather to the conservation of the property than the operation of the lines, but there are many features of the arrangement in which operating officials will be interested. It will be understood clearly by all who are familiar with the terms of the lease that the city has no definite part in the ownership or operation of the property, public opinion to the contrary notwithstanding. While the franchise extends for 25 years, although Mayor Johnson would have preferred a term of 50 years if the Council had held authority to grant a franchise for that period, the lease extends for 50 years, and is renewable at the option of the Traction Company for terms of 50 years forever; subject, however, to various contingencies, one of which is that in case the unexpired term becomes less than 15 years without renewal a default occurs. The Traction Company may assign the lease to the city of Cleveland, or may purchase the property and sell it to the city of Cleveland, if the latter acquires the right by law to "own, purchase or operate street railways."

Other conditions which will be of especial interest are those defining the capital, as distinct from the operating expenditures, and the provisions compelling the establishment of a "maintenance and renewal account" and an "accident reserve fund."

VALUE OF THE PROPERTY

The lease of the property of the Cleveland Electric Railway Company was based on a valuation of \$22,184,000, represented by the following securities: Bonds, \$8,026,000, taken at par; floating debt, \$1,288,000, taken at par; capital stock, \$12,870,000, representing 55 per cent of the total outstanding stock of a par value of \$23,400,000. The Cleveland Electric Railway Company changed its name to the Cleveland Railway Company. Prior to the execution of the lease, but after the valuation as fixed, the Cleveland Electric Railway Company purchased the property and franchises of the Forest City Railway Company, the competing line established by Mayor Johnson, for \$1,805,600 capital stock.

The lease provided that the Cleveland Electric Railway should lease its entire system, franchises, tracks, real and personal property, rights and privileges, etc., to the Muni-

pal Traction Company. These grants included what is known as the renewal or security ordinance passed by the City Council of Cleveland on April 27, 1908, and also the grants of the various villages. Although there may be extensions, the term of the present lease is 50 years from and after Dec. 31, 1907, limited, however, as to those portions of the property which were outside of the city of Cleveland to the period of the duration of the franchises or renewals thereof. It is provided that the Traction Company, by giving notice in writing six months prior to the date fixed for expiration of the lease, provided it shall not have been terminated in the meantime, shall have the privilege of renewal upon like conditions for an additional term of 50 years, and thereafter in like manner for terms of 50 years forever.

It was provided, however, that if the unexpired term of the franchise granted by the city of Cleveland to the Railway Company or hereafter granted, in addition thereto, or as renewals thereof, shall at any time during the term of the lease or any renewal thereof become less than 15 years in duration without a valid grant of renewal having been made by the authorities on the same terms and conditions save as to length of grant as those embodied in the ordinance passed on April 27, 1908, the lease then shall cease, it being intent that the term of lease or any renewal thereof shall not extend beyond the date when the unexpired term of the franchise or any of them shall be less than 15 years.

RENTAL

The Traction Company agrees to pay to the Railway Company: (a) 6 per cent annually upon \$14,675,600 of capital stock of the Railway Company in quarterly installments of $1\frac{1}{2}$ per cent each, the first payment to be made on July 1, 1908. (b) If any increase is made in the outstanding Railway Company stock under the terms of the lease, an amount equal to 6 per cent upon this stock. (c) Interest on the outstanding bonds of the Cleveland Electric Railway and subsidiary lines. (d) Interest on new bonds issued under the terms of the lease. (e) Interest or discount on the floating debt of the railway.

If any installment of the rental on the stock shall not be paid promptly the installment shall bear interest at the rate of 8 per cent per annum. The installment of rent for the next ensuing quarter, if the prior installment is still unpaid, shall be $1\frac{3}{4}$ per cent on the capital stock. Two such defaults, subject to these penalties, may be made before a forfeiture can be declared.

The Traction Company is to pay all taxes and licenses accruing after Jan. 1, 1908, it being the intent and meaning that all payments of rental shall at all times be applicable by the railway as a dividend fund for its stockholders.

The Traction Company assumes all the legal debts, contracts, obligations and liabilities of the railway incurred since Dec. 31, 1907, and all incurred prior to that time except the outstanding bond issues and floating debt and accident liabilities and certain other liabilities, to meet which the Railway Company has deposited with the Traction Company \$293,050. The Traction Company agrees to pay interest at the rate of 6 per cent per annum on the average yearly balance in this fund and to hold and apply the fund for two years from April, 1908. Any balance remaining in the fund on April 1, 1910, after a reasonable amount shall have been deducted for the payment of such claims and indebtedness as shall have been presented and shall be unadjusted at that time is to be paid to the Railway Company, which will distribute the same among the stockholders of record on April 1, 1908. The Traction Company

is to supply any deficiency in the fund if it is not sufficient for the purpose.

The Traction Company agrees to protect and save harmless the railway from the payment of any debts, claims, liabilities and obligations that may grow out of the operation of the railway. It agrees to carry out all grants to and contracts of the Railway Company and all extensions and additions thereto. The Traction Company agrees to perform all legal acts necessary to preserve intact and fully protect the property and franchises and extensions, etc.

MAINTENANCE AND RENEWAL FUND

The clause in relation to maintenance of the property states that the Traction Company agrees "to at all times during the term of this lease or any renewal hereof maintain, renew, replace, preserve and keep the said railway system and property hereby demised, and every part thereof, and all extensions, betterments and permanent improvements hereafter made, in good condition, thorough repair and working order at its own expense, and to repair, replace and maintain in good condition and repair at its own expense, all property which shall be damaged, injured or destroyed from any cause or agency, or become worn out or unfit for use, with similar property of the same or greater value than the property so damaged, destroyed, worn out or unfit for use; provided, however, that the standard of condition, repair and working order which the Traction Company shall be required to keep and maintain during the term of this lease, or any renewal hereof, shall not be higher for the entire system than the average of repair, working order and condition as of the first day of January, 1908, as shown by the aforesaid schedule thereof, which for the purposes of this covenant it is agreed is 70 per cent of its reproduction value." This covenant shall not apply to additional lines or other properties acquired or constructed wholly from surplus earnings or premiums on stock.

The Traction Company agrees during the term of the lease and any renewal thereof to keep an account known as "maintenance and renewal account" and to credit to it and charge to operating expense account each month a sum equal to 5 cents per car mile during the first year, 5.25 cents per car mile during the second year, and 5.5 cents per car mile during each year thereafter until readjusted, for each car mile made in the operation of the street railways subject to the lease. In ascertaining these sums the mileage made by trailers not equipped with motors shall be computed at one-half the rate of motor cars. Against this account may be charged all expenditures and disbursements made for maintenance, repairs and renewals, and also all expenditures and disbursements made for betterments, extensions and permanent improvements not paid for out of capital stock or of sales of unused property or proceeds of liquidated damages or insurance policies. Any credit due to this account shall be paid by the Traction Company at least once in each three months during the term of the lease or any renewal thereof to a trustee to be chosen by the railway, or the Traction Company may invest the monthly credit balance as well as any fund on deposit to the credit of the fund in capital stock of the Railway Company at the market value or in other securities approved by the Railway Company. The first payment of the credit balance, if any, shall be for the period to Aug. 1, 1908, and shall be made on or before Aug. 15.

For the purpose of immediate maintenance, renewals and repairs, the Traction Company may use the proceeds of

the sale of \$250,000 of capital stock of the Railway Company, such proceeds or such part thereof as may be used to be repaid to the Railway Company in installments over a period extending until April 15, 1912.

ACCIDENT RESERVE FUND

The Traction Company also agrees to credit each month to a fund to be known as "accident reserve fund," charging same to operating expense, for the settlement of claims for damages growing out of injuries to persons or property and for the payment of attorney and counsel fees, surgeon, ambulance and hospital expenses, court costs and expenses incident to the investigation and adjusting or resisting said claims and in conducting all litigation growing out of these claims or arising from the treatment of persons injured and for the repair of property damaged, the sum of 0.7 of a cent per car mile for the first year, 0.8 of a cent per car mile during the second year, and 0.9 of a cent per car mile each year thereafter until readjusted, the mileage to be computed in the same way as under the clause governing the "maintenance reserve."

Treatment of the credit balance at the end of each six months is to be similar to that provided for the maintenance reserve fund.

INSURANCE ACCOUNTS AND EXAMINATION

The Traction Company is to keep the rolling stock, buildings and contents insured against fire in the sum of \$4,777,700, distributed as follows: Buildings, \$689,800; contents other than rolling stock, \$1,626,900; rolling stock, \$2,461,000. Insurance is to be increased or reduced with property changes.

The Traction Company is also to maintain and renew all automatic sprinkler equipment, etc., and to maintain offices and vaults for the Railway Company.

The Traction Company is to keep in its office, open to inspection at all reasonable times by the Railway Company, full, true and accurate accounts of all money received and business done and of all money expended and liabilities incurred in connection with said business and the maintenance and operation of the property, and also complete statistical accounts of the business and operations. These accounts shall be kept in the manner prescribed by the American Street & Interurban Railway Accountants' Association. The Traction Company shall also furnish to the Railway Company monthly reports of the car mileage and earnings and such other statements and reports as the Railway Company may reasonably request from time to time.

The Railway Company is to have the right at all reasonable times to inspect and examine the property, the Traction Company to pay the expense of one examination and report annually by an expert engineer designated by the Railway Company if the latter shall require the making thereof. The Railway Company shall also have the right and privilege by such agent or accountant as it may designate to examine and audit at all reasonable times the payments, accounts, vouchers, records and other papers of the Traction Company at the expense of the latter.

The Traction Company agrees that it will not apply for or accept, either directly or indirectly, in its own name or in that of any other person, company or corporation a grant to operate a street railway or any extension in Cuyahoga County, Ohio, or in any subdivision or municipality thereof during the term of the lease, or any renewal thereof without the consent of the railway, and that it will not without like consent contract to construct, maintain or operate any street railway, it being the intent that all addi-

tions to and extensions of the present system shall be the property of the Railway Company. The latter company will not apply for grants without the consent of the Traction Company.

The Traction Company agrees to keep the property free of mechanics' or other similar liens.

FINANCING EXTENSIONS, ETC.

The authorized stock of the Railway Company is made \$35,000,000. The amount which the Railway Company contracted should be issued as of April 28, 1908, was \$14,675,600, leaving \$20,324,400, which the Railway Company has resolved is subject to future sale and issue. With the exception of the amounts of \$8,277,000 and \$1,288,000, which will be used to retire respectively the bonds and funded debt of the Cleveland Railway Company, the authorized stock may be issued and sold at a price not less than par, the proceeds to be used only for the purpose of paying for extensions, betterments and permanent improvements, provided that 80 per cent only of the cost of such extensions, betterments and permanent improvements is to be paid from such proceeds.

On the request of the Traction Company the Railway Company will issue and sell the following amounts, the proceeds of which may be devoted to these purposes: \$250,000, the proceeds of which will be used for repairs, maintenance and renewals; \$1,500,000, the proceeds of which will be used for track extensions, betterments and permanent improvements; \$1,350,000, the proceeds of which will be used for purchasing new and additional rolling stock and car equipment; \$2,150,000, the proceeds of which shall be used in purchasing, constructing and equipping new and additional power houses, power stations or car shops; \$1,500,000, the proceeds of which will be used in constructing a viaduct across the Cuyahoga River.

The Traction Company has the right to apply the proceeds of sales of stock sold for some one of the purposes, excepting, of course, the refunding issues, to any one or more of the other purposes. Any excess of proceeds from the sales of stock for these purposes above the par value of the stock may be expended by the Traction Company for any purpose provided for in the lease other than operating expense or for any unusual or extraordinary expense, and in the event of disagreement between the parties as to the facts of any such unusual or extraordinary expense such dispute shall be arbitrated.

After the present authorized stock has been sold, the Railway Company agrees, if its board of directors agree that further issues of stock are desirable, to hold such meetings as may be necessary to increase its stock. The proceeds of such stock shall be used only in making extensions, betterments and permanent improvements and only to the extent of 80 per cent of the cost of such extensions, betterments and permanent improvements.

OPTION OF PURCHASE

The Railway Company agrees that at any time during the lease or any renewal thereof, the Traction Company shall have the privilege of purchasing all of the property at a sum equal to the par value of the capital stock outstanding, plus 10 per cent, the Traction Company assuming in addition thereto all the indebtedness, obligations and liabilities and liens on the property. The title, if conveyed in this manner to the Traction Company, shall be subject to being divested from the latter and vested in the city of Cleveland upon the municipality having acquired the legal right to own the property, repaying to the Traction Com-

pany the amount paid by it plus the actual cost of extensions, betterments and permanent improvements, with interest thereon at 6 per cent, less such part, if any, as shall have been paid out of surplus earnings, the city assuming in addition thereto all indebtedness, obligations and liabilities and liens. The deed, conveyance and assignment from the Railway Company to the Traction Company shall provide that the title transferred and conveyed to the Traction Company or by it to any subsequent grantee shall be defeasible whenever the city of Cleveland, having acquired the lawful right to do so, shall exercise its option or privilege to purchase the property, rights and franchises on the terms provided and that whenever the city tenders the payment and assumption of purchase price on the terms provided the title shall pass from the Traction Company or any subsequent grantee to the city of Cleveland.

EXTENSIONS, BETTERMENTS AND IMPROVEMENTS

The words "extensions, betterments and permanent improvements" as used in the lease in distinction from repairs, maintenance, renewals and replacements of property shall be held to mean the acquisition, construction and equipment of additional lines of street railway, power houses, switches, sidings, turnouts, car houses, shops, rolling stock, machinery and other property, and all expenses necessarily incident to such construction and equipment; provided, however, that when any existing property delivered by the Railway Company to the Traction Company under the lease is replaced by other property the cost whereof is in excess of the value of the property as scheduled, and also whenever property hereafter acquired is replaced by other property at a greater cost than would be the first cost of such property if new at the time of replacement, then such excess of cost shall be deemed to be an extension, betterment or permanent improvement within the meaning of the lease. Seventy-five per cent of the cost of reconstructing or remodeling car bodies delivered under the lease, so as to make them "pay-enter" cars, shall be deemed to be an extension, betterment or permanent improvement.

The Traction Company may from time to time, at its discretion, construct such buildings, car shops, car houses, sidings, switches, additional tracks, turnouts, branch lines, extensions, betterments and permanent improvements to the property as may be in its judgment necessary to increase, improve and take care of the business and service of the railways. The Railway Company agrees to secure an extension of time for the payment of the floating debt of \$1,288,000 for the period of two years from Dec. 31, 1907. The Traction Company has the option of paying or extending the time of payment of the bonds and of paying the floating debt in any one of several methods.

METHOD OF ARBITRATION

If either party shall at any time after three years from delivery of possession under the lease be of opinion that the sum to be credited monthly to the "maintenance and renewal" account is smaller or larger than is necessary to make adequate provision for maintenance and depreciation, then at the request of either party the amount shall be readjusted, not oftener, however, than once a year. A similar provision is inserted in relation to the accident reserve fund. In the event of disagreement with respect to these amounts, the figures shall be fixed by arbitration. The party desiring arbitration shall give notice, and if the other party fails to act within 20 days the judge of the District Court of the United States for the district in which the city of Cleveland is situated, or, failing his action, any

judge of the Circuit Court of Appeals of the circuit in which the city of Cleveland is situated, shall appoint a disinterested arbitrator and the two arbitrators shall appoint a third. If the two are unable to agree upon a third arbitrator, one of the judges of a United States court, in the order indicated in the foregoing, shall appoint a third. Unless the arbitrators agree unanimously otherwise, the entire expense of such arbitration shall be met by the Traction Company.

LIABILITY FOR FAILURE TO EXTEND OUTLYING GRANTS

The expiration, failure to obtain renewals or the forfeiture or cancellation of any franchise of the Railway Company outside of the present limits of the city of Cleveland shall not operate as a forfeiture of the lease, but if due to any act or neglect of the Traction Company, the latter shall indemnify the Railway Company against any liability which may be imposed upon it in damages or otherwise to persons other than the railway. And unless within 18 months after such expiration, if the same be due to the neglect of the Traction Company, there shall have been obtained a new grant in lieu of the grant expired on conditions not less favorable to the Railway Company than those of the franchise embodied in the ordinance passed by the Cleveland Council on April 27, the Traction Company shall pay the reproduction value less depreciation of the physical property thereby rendered useless, except as to various lines, and shall pay twice the reproduction value less depreciation of such physical property so used on other lines. Nothing is to be paid on account of the physical property on one line. It is agreed that these sums shall be the value of the right lost by reason of such neglect which shall be paid by the Traction Company as liquidated damages and not as a penalty.

DEFAULT

Various provisions are inserted regarding default. If there should be a default in payment of any installment of rent, and such default shall continue for six months and thereafter, the Railway Company shall give to the Traction Company 60 days' written notice of its intention to forfeit the lease and the Traction Company shall not within 60 days have paid all of the sums in default, the lease and the option of purchase shall cease.

Failure to meet the interest on outstanding or other bonds or interest or discount on the floating debt, or any sum of liquidated damages following the failure to secure a renewal of franchise or to make payment of the maintenance and renewal and accident reserve funds within 30 days after they are due, or of any judgment required to be paid by the Traction Company within 30 days after it is due and payment therefor has been made constitute default.

In case the Traction Company causes or permits any franchises now or hereafter held or any renewal thereof to be cancelled, or fails to comply promptly with any award made by arbitrators or should attempt to sell, assign, mortgage, pledge or transfer the lease or the option of purchase, except as authorized to the municipal corporation of the city of Cleveland, or in case the Traction Company shall permit any involuntary transfer or alienation of the lease or the option, or in the event that possession of the property or any substantial portion thereof shall pass from the Traction Company by any judicial or summary proceedings there shall be default.

In the event that the Railway Company shall notify the Traction Company of the fact that notice has been received from the city of Cleveland that the city intends to forfeit any franchise or renewal thereof now existing or hereafter granted or any failure to comply with the terms of the

franchise or renewal or any requirement of the general ordinances of the city, failure to comply with which may work such forfeiture and the Traction Company shall fail for a period of three months thereafter to comply with such franchises or requirements, there shall be default.

Default would also be made in the event of the refusal of the Traction Company to permit the Railway Company or its representatives to examine its accounts, vouchers, records and other papers as provided in the lease for 60 days after the Railway Company shall so request in writing.

(To be continued.)

EXTENSION OF TRANSFER ZONE IN CHICAGO

On Aug. 1 the transfer arrangement as provided in recent ordinances was put into effect by the Chicago City Railway and the Calumet & South Chicago Railway. An illustration of the form of transfer used is presented. With this arrangement transfers will be issued and accepted at eight points of intersection of the two railway systems. This arrangement places the southern boundary of the 5-cent fare zone at Seventy-ninth Street and now makes it possible by means of the present transfer arrangement and the through routes between the north and south sides for the passenger to obtain a ride of about 30 miles for a single

Union Spokane	W. Pullman & S. Park Av.	75th St.	63th St. S. Park Av.	Chicago S. Park Av.	Stoy I.	William Stoy II.	75th St. S. Chi. Av.	S. Chicago S. Chi. Av.	S. Dearling Stoy I.	Hammond Hed. Av.	Whiting Hed. Av.	Terminal Polio	Thro' Car	Emergency	Eggleston	The Lake Mid-Crossing	Stoy I.	61st Ter.
RECEIVABLE ONLY—at intersecting point— on a crossing, diverging or extension line— for a continuous trip, in an onward direction. of person to whom issued. Void 15 minutes after time punched or if transferred. (SPECIAL) Calumet & South Chicago Railway Co.																		
GOOD IN REVERSE DIRECTION To Next Junction Only. NOT GOOD FOR PASSAGE South of 79th street.																		
DIRECTION OF TRAVEL WEST NORTH EAST SOUTH																		
(F) MIN. 0 10 20 30 40 50																		

New Transfer Ticket, Chicago

5-cent fare. The new transfer will be honored by both companies subject to the same regulations that govern regular transfers.

MEETING OF COMMITTEE ON RULES

A meeting of the committee on standard code of rules for high-speed interurban lines of the American Street & Interurban Railway Transportation & Traffic Association was held in Cleveland on Monday of last week. The following members of the committee were present: J. N. Shannahan, chairman; L. E. Fisher, F. D. Carpenter and J. E. Duffy. By invitation of the chairman C. D. Emmons, of Fort Wayne, chairman of the committee of the representatives of the Indiana companies, who recently formulated a code of rules which was recommended and adopted by the Board of Railroad Commissioners of that State, was also present.

The efforts of the committee were directed toward harmonizing the various codes which have been adopted within the past two years by the different associations. It is hoped that the revised code, which will be submitted to the Transportation & Traffic Association at its annual meeting at Atlantic City in October, will be one that can be approved and adopted by all the member companies.

A tunnel more than a mile in length, said to be the longest in existence for use by a municipal electric railway, has just been opened for operation by the Genoa Street Railway. It connects Genoa with the adjacent large commune of Rivarolo, which previously was reached by circling the mountain, the distance being now shortened 1 1/3 miles, and the trip is made in 15 minutes less time. Constructive work began on June 1, 1905.

COMMUNICATIONS

INTERCHANGEABLE MILEAGE TICKET OF THE CENTRAL ELECTRIC LINES

JULY 27, 1908.

To the Editors:

In the issue of the *ELECTRIC RAILWAY JOURNAL* of July 25, 1908, you published an editorial relating to the interchangeable mileage ticket. The importance of this ticket should not be overlooked. At the last meeting of the Central Electric Railway Association at Toledo, a traveling man was given the floor in order that he might tell the other side of the question. All who attended that meeting will remember his statement of what the commercial traveler desires. This new ticket fills that want. The regular commercial traveler wants a ticket that will take him over all the roads without making it necessary for him to stop and pay a number of 5-cent, 10-cent and 15-cent fares and then lose count of part of them and be out of pocket at the end of the week. If he can purchase a mileage ticket that will take him over all electric lines he will save work for his firm, as it will not have to check up a lot of small fares on the expense account each week.

Then, again, the traveling man usually routes the goods that he sells and, of course, if he travels by electric lines he will send his shipments that way.

The greatest complaint that the traveling public has is the lack of information regarding long trips via trolley. A man can secure information from any steam railroad agent that is reliable and of value in a trip to any point in the western hemisphere, but in most cases he cannot secure information that will take him out of the State, sometimes the county, via trolley. That is where the interurban lines are weak. Another complaint is that the prospective passenger does not know the different regulations regarding baggage and other small matters which may or will inconvenience him on his trip.

The Central Electric Railway Association and its offspring, the Central Electric Traffic Association, are trying to remedy this situation and will do so if they have the support and encouragement that they deserve. Their field is unlimited and the good that they can do is beyond estimate.

The steam lines are strongly and compactly organized at present, which explains their success in all of their undertakings. Their different traffic associations deal with the perplexing questions in a fair and impartial manner, and the information that they transmit to their members and through them to the agents is valuable and authentic. This enables the agents to be in a position at all times to take care of any business that may present itself without any delay. The traveling man and shipper will not permit any delay if there is any way to avoid it. They will not wait for the electric line to get the information they seek if they can secure it without delay from the steam road. A number of the traffic men have had evidence of this fact.

When each electric line can furnish the public with any legitimate information that may be desired regarding rates, time of trains, rules for checking baggage, etc., of its connections, then, and only then, will the revenues of the lines take a gradual climb upward and their financial standing as profitable enterprises be assured.

Under the "exceptions" on the mileage ticket an opportunity is given to the various lines to put before the public in a condensed manner some information that will obviate

some of the complaints. Other and more important information may be presented through the publications that the association will put out if it has the proper encouragement from the lines in the territory.

It is the duty of every line to help out the cause by encouraging the association and trying to work for the interests of the electric lines in general.

It might be well, in conclusion, to refer to the fable of "The Bundle of Sticks." INTERURBAN.

FREE TRANSPORTATION OF CHILDREN AN ANNUAL EVENT

FT. WAYNE & WABASH VALLEY TRACTION COMPANY,
FORT WAYNE, Ind., July 27, 1908.

To the Editors:

The practice of giving free transportation to children of Fort Wayne to Robison Park once a year was established several years ago because of the inability of a large number of children to get to the park otherwise. This day became a feature with us and it is a source of great pleasure to us to see the poor children get the advantages of the park at least this one day. Somewhere between 6000 and 7000 children took advantage of this opportunity on July 15 of this year.

C. D. EMMONS,
General Manager.

OPERATION OF 2000-VOLT GENERATORS

BERLIN, Germany, July 22, 1908.

To the Editors:

In an article entitled "Electric Railway Notes from Europe" in your issue of June 6, 1908, there is a note on our plant in Maizières which might produce the impression that the use of direct current high-tension generators is specially dangerous. The facts are as follows:

The electric work at 2000 volts had been suspended for some time on the Maizières-St. Marie Railway, because the electric power available was required by the electric rolling mills of the Rombach Iron Works. But this deficiency has been made up by increasing the capacity of the power station and the Maizières electric railway has been working without any trouble since then.

The attendance on the 2000-volt generators is no more dangerous than on 500-volt machines. The insulation of the brush holders and of the other parts of the generators which need attention is sufficient to prevent any injury to the attendants. Moreover, no attendance is required by the machine during operation, as it runs without sparking under all loads. These generators, as well as the locomotives, have proved to work as safely as machines for ordinary voltages.

SIEMENS-SCHUCKERT WERKE.

MEETING OF COMMITTEE ON MAINTENANCE AND INSPECTION OF ELECTRICAL EQUIPMENT

The committee on "Maintenance and Inspection of Electrical Equipment" met at Cleveland, Ohio, on July 22, 23 and 24. The full membership was present, as follows: L. L. Smith (chairman), master mechanic Chicago & Milwaukee Electric Railroad, Highwood, Ill.; E. T. Munger, master mechanic Metropolitan West Side Elevated Railway, Chicago; L. W. Jacques, master mechanic Ft. Wayne & Wabash Valley Traction Company, Ft. Wayne, Ind.; S. T. Maize, master mechanic Rochester Railway Company, Rochester, N. Y., and also, by invitation, E. H. Anderson,

General Electric Company, and J. L. Davis, Westinghouse Electric & Manufacturing Company. A large number of subjects were considered and substantial progress was made toward completing the work for the year. It is expected that the report of this committee, which will be rather voluminous this year, will soon be ready for publication.

Before the Cleveland meeting data blanks were sent out with a view to ascertaining the attitude of the company with regard to the recommendations made by the committee which reported at Atlantic City last fall. Answers to these data sheets were received from 58 companies owning 13,319 cars. Accompanying the answers were suggestions of value to the committee in its work. A tabulation of the information received on the data sheets has been made. This shows in percentages the number of roads using, recommending and approving the methods of maintenance and inspection advanced by last year's committee.

During the three days' session at Cleveland the committee considered and discussed the suggestions and recommendations made on the returned data sheets. It also compiled information and approved recommendations for a considerable number of other subjects, as follows:

Car house organization—Rules for inspection of various types of car houses were discussed.

Air compressor maintenance—Rules were formulated for overhauling and inspecting air compressors and motors.

Mileage basis vs. time basis for inspection—This subject received a thorough handling and definite recommendations will be made with regard to the proper basis for inspection.

Carbon brushes—It is thought that especially valuable work was done in the consideration of carbon brushes. In taking up this subject the brushes were divided into three classes, depending upon their chemical make-up. The three kinds are defined as coke, coke and graphite, and graphite, all brushes falling within one of these classes. With a view to formulating specifications that would give the best brushes for various services, the committee considered the recommendation of certain tests, such as conductivity, strength and mechanical life. Simple and definite tests of these characteristics were discussed along with the recommendations.

Lubrication, particularly with regard to gears—Lubricants were considered under three classes: (1) Fatty or oily, containing no graphite; (2) sticky and non-fatty; (3) graphite, depending wholly or in part on graphite to afford lubrication.

Insulating paints—The kinds of paints and varnishes were divided into classes according to their various qualities. The committee will consider the chemical composition of paints which are best suited for various classes of work.

Armature and axle liners—The committee considered the qualities of various compositions of babbitt and bronze for armature and axle bearing liners. Formulas will be included in the report and recommendations will be made as to how to get the best value out of bearing metals of various compositions.

Trolley wheels—Important characteristics for various services were considered and suggestions will be made especially with regard to the desirability of balancing wheels for high-speed interurban service. A simple test for balance also will be described in the committee's report.

The cars of the Metropolitan Street Railway Company, of New York, which hitherto have been painted orange or cadmium, will hereafter be painted green with aluminum striping and lettering.

OPENING OF NEW SECTION OF THE PHILADELPHIA SUBWAY

An account was published in the *STREET RAILWAY JOURNAL* for Dec. 23, 1905, of the opening of the Philadelphia subway from Fifteenth Street to the Schuylkill River. During the past 2½ years the company has been prosecuting the work of the extension of the subway from Fifteenth Street around the City Hall and east on Market Street. This work is in the most congested part of the city, but has now been completed as far as Second Street and trains were put in operation on Aug. 3.

On July 30 the new portion of the subway was opened for inspection, and advantage was taken of the opportunity to examine the construction by a large number of railway men and prominent citizens of Philadelphia, to whom invitations had been extended. It is stated that nearly 5000 persons were present and walked from Fifteenth Street to Eighth Street, where a repast was provided, and thence to the present terminus at Second Street. Owing to the large number of persons present no attempt was made to carry the people by trains. Among the officials of the Philadelphia Rapid Transit Company present were President John B. Parsons, Vice-presidents George D. Widener and Chas. O. Kruger, Director P. A. B. Widener, Assistant Manager F. H. Lincoln and Chief Engineer W. S. Twining. Mayor Reyburn and other prominent representatives of the municipal government were also in attendance.

The subway below the City Hall is of reinforced concrete throughout. Between Thirteenth Street and Second Street there are two tracks for express trains, the local cars which use the subway west of the City Hall being taken around that building on a loop. The stations are very commodious and special entrances have been built from a number of them to the adjoining department stores.

The track construction used is similar to that in the part of the subway built earlier and which has been illustrated in these columns. Each rail is mounted on a wooden block which is held in position by ¾-in. bolts passing through the block and the upper flanges of two 15-in. channels. The channels are spaced 15 in. apart by separators, and the space between them is filled with concrete, so that the wooden block rests directly upon the concrete. No ballast of any kind is used, so that the subway is very easy to keep clean. The third-rail is of the under-running type.

The roof is supported by a center row of steel columns between the two tracks, except where provision is made for cross-overs between the east and westbound tracks. The columns are here omitted, and the roof is made in one span. The latter is rendered waterproof by a layer of asphalt mastic, protected by concrete.

Work on the subway east from the City Hall was begun by the contractors, the Millard Construction Company, June 4, 1906, near Front Street. From Fifteenth Street to the Delaware River the subway is 7130 ft. long, and contains 16,748 ft. or 6¼ miles of single track, including the loop around the City Hall. There are five stations in the new section, at Second, Fifth, Eighth, Eleventh and Thirteenth Streets. The stations are 350 ft. long and 100 ft. wide, and the platforms will accommodate eight-car trains. Each station is provided with ample exits and entrances.

The subway is 26 ft. 6 in. wide inside. The highest point from the base of the rail to the roof is 14 ft. 5 in., while the lowest part is 14 ft. 2 in. high. The construction of the new section involved the excavation of 400,000 cu. yd. of earth and the use of 67,000 cu. yd. of concrete and 12,750,000 lb. of steel.

JOINT HEARING ON UNIFORM ACCOUNTS FOR NEW YORK ELECTRIC ROADS

A joint hearing by the New York Public Service Commissions of the First and Second Districts on the proposed system of accounts for street and electric railways was held in Albany on Tuesday of this week. Frank W. Stevens, chairman of the Second District Commission, presided.

Commissioner Stevens requested at the outset that, in order to save time, the discussion be confined to the undesirable features of the classification, if any. He asked whether the Street Railway Association of the State of New York had a representative present.

Edgar S. Fassett, general manager United Traction Company, of Albany, president of the association, said it had been decided that the companies should appear individually. Commissioner Stevens then proceeded to call the roll of the companies in the Second District.

George A. Harris, general auditor Adirondack Lakes Traction Company, said that his objection was that the entire scheme was too elaborate for small companies.

A. M. Murphy, receiver of the Catskill Electric Railway, said that the gross earnings of that company were a little less than \$20,000 a year, and that it would cost a large percentage of the revenue for bookkeepers under the proposed classification.

H. M. Beardsley, secretary and treasurer Elmira Water, Light & Railroad Company, stated that the large number of accounts proposed impressed persons connected with small companies. He had found that under the tentative classification his company would have to keep over 300 accounts, and he was sure that the office force would have to be doubled. Referring to balance sheet account No. 1, "Fixed Capital Account June 30, 1907," Mr. Beardsley said he understood that the actual cost value of the property was all that was to be charged to this account, and he inquired if the purpose of the commission was to go back to the foundation of the company.

W. J. Meyers, statistician for the Second District Commission, said that was the purpose if it was possible to secure the information. Mr. Beardsley said that the clause was retroactive in the extreme. Mr. Meyers replied that the commission asked to have the cash cost set forth. If that was impossible the text would have to be modified. The charge for unamortized discount on debt would be entered in the same priority as interest payments before provision for dividends.

Mr. Beardsley said that it seemed to him the commission had no right, at least no moral right, to take that position. The former Railroad Commission adopted the old classification of the American Street & Interurban Railway Accountants' Association, which provided for the treatment of interest and discount in connection with construction expenditures as a capital charge. Mr. Beardsley said that the commission might set up this account when its system went into effect, but he thought the fact should be taken into consideration that the former commission had recognized other practice. The following illustration from the tentative classification was quoted by Mr. Beardsley:

A building, original cost unknown but estimated to be \$15,000, is bettered by the construction of an elevator shaft and its stairways are modified so as to be fireproof; the actual expenditure for these changes is \$3,000; the estimated cost of replacement of the building (as modified) with one equally serviceable and with an equal expectation of life is \$16,000; the charge to capital account as a betterment should be \$1,000, and the remainder (\$2,000) of the

expenditure, should be charged to the appropriate repairs account.

In answer to questions from Mr. Beardsley, it was stated by Mr. Meyers that the building was admittedly obsolete until the change was made. If the capital charge was the total of \$18,000, there would be no allowance for deterioration in value. The engineering expense and cost of making plans should be charged to operating expense.

It is provided in the classification that discounts realized through prompt payment of bills for materials and supplies used in construction shall be credited to balance sheet account No. 56, "interest during construction." Mr. Beardsley said it had been customary in some places to treat cash discounts as other income. Mr. Meyers said that this practice was not advisable because it got costs to that extent away from cash value. An objection to the account "casualties reserve" was entered by Mr. Beardsley.

W. H. Davies, comptroller of the Hudson Valley Railway, said that as he understood the Public Service Commission's law it required that the system to be established should conform as nearly as may be to that prescribed by the Interstate Commerce Commission. He suggested the possibility of differences between the two systems, as comparisons cannot be made on account of the fact that the interstate classification has not yet been promulgated. Mr. Davies said that some time would be required to introduce the system and that the text of the accounts really made the scheme retroactive. He said that it had been the practice of some roads to charge additions and betterments to operating expenses, but that, although they were not to be allowed to revive such charges, it was proposed to introduce accounts to compel amortization of interest and discount on bonds issued for construction expenditures.

Henry J. Pierce, president of the International Railway Company of Buffalo, said he would confine his discussion to the subject of depreciation.

STATEMENT OF H. J. PIERCE

Mr. Pierce then made the following statement:

The International Railway Company respectfully submits the following considerations arising out of its own situation why accounts Nos. 28 and 44, of income accounts, relating to depreciation of way and structures, and depreciation of equipment, respectively, should not be now included in the form proposed in any accounts imposed upon street railway companies.

The International Railway Company was organized in 1902 as a consolidation and unification of various electric railway and bridge companies in the State of New York and the Province of Ontario.

All of the capital stock of each of these constituent companies had been acquired during the three years preceding their consolidation by the International Traction Company, a New Jersey corporation, which now is and at all times has been the sole stockholder of the International Railway Company.

The New Jersey corporation has advanced to the International Railway Company many millions of dollars for additions, betterments and improvements and these moneys have been raised by the sale of bonds of the New Jersey corporation, which has received like amounts of stock in or certificates of indebtedness of the International Railway Company, in exchange for the moneys so advanced.

All of the constituent companies of the International Railway Company, as well as the International Railway Company itself, have been permitted from the time of their organization to keep their accounts without any direct provision for depreciation, and in this respect the accounting of street and electric railroads has followed the practice of 70 years in steam railroad accounting.

Moreover, it has not been uniformly regarded as essential for municipal corporations, which, of all governmental bodies, are most nearly analogous to public service corporations, to withdraw from taxpayers annually specific sums.

to cover irreparable wear and tear of water works, sewers, fire department equipment and public buildings, and other municipal property devoted to the common good. There is no distinction in principle in withdrawing money from taxpayers for such purposes, and in withholding it from stockholders.

The commission will bear in mind that a considerable proportion of the tangible property of this company used in public service consists of private lands, buildings thereon and machinery placed therein. The effect of the establishment of the proposed depreciation accounts will be to limit the return upon this property to its owners as compared to the return upon adjoining property, similarly situated, not utilized in public service. It is clearly unfair to withhold from a street railway company a rate of earnings upon its private property such as it otherwise might receive, simply because it has used this private property for public service.

The present owners of this railroad system acquired the same prior to the passage of the Public Service Commission's law, and prior to the adoption of that act provided for depreciation by appropriating 5 per cent of the gross earnings of the company to a depreciation account, which has been used in replacing worn out track and equipment.

The proposed accounts Nos. 28 and 44 involve, if this company understands them aright, a monthly estimate of wear and tear incapable of repair, and of loss due to obsolescence.

It is respectfully submitted that an estimate so made is not properly a matter of accounting at all. Accounts deal with fixed and known facts and figures, while such an estimate requires, at most, an approximation of the probabilities.

The estimates called for by accounts Nos. 28 and 44, while largely speculative, require the utmost good faith on the part of the officers making them, and it seems to this company that good faith in the making of such an estimate, within the language of the text, might compel charging to this account more of its gross earnings in each year than it could afford to make.

The form of organization, the extent of capitalization, and the rates of fare adopted by the Legislature and by the railroad company, have all been based upon the theory that direct depreciation charges of the character sought to be imposed by accounts Nos. 28 and 44, were not applicable to an electric railroad, under present conditions and in growing communities, or that, in any event, these charges were matters within the discretion of the board of directors of the companies. Many of these rates of fares have become fixed by the provisions of local franchises and the most important of them are covered by Sections 101 and 104 of the Railroad Law, and are not within the control of the companies, or the Public Service Commission.

If to the increased operating expenses due to higher wages and higher prices of materials and higher taxes than those obtaining at the time these fares were fixed, is to be also added a theory of accounting requiring a decreased valuation to be annually placed upon the tangible property, and no valuation for indicant account purposes to be fixed or placed upon the property of this company as an entirety, then, only by an increase of fares can a fair return be received upon the property utilized in the public service.

If the immediate establishment of the proposed depreciation accounts and a bona fide observance of them are compelled, the Public Service Commission (1) should permit an appreciation account of additional assets, by reason of increase of the value of good will, to be ascertained annually upon the basis of the increase of earnings, or (2) should procure from the Legislature authority to this company to increase its rate of fare by charging for transfers, or otherwise.

Particularly would the proposed accounts work hardship to the company as applied to those outlying extensions which have been built not at the instance of the railway company, but at the demand of the public and in aid of and in advance of the growth of the city, the operation of which could not but show a loss for years to come and the sole advantage of which to the company lay in the hope of future earnings. Both the public and the railway company were aware at the time the extensions were built that they were not warranted by the traffic that existed, and it was tacitly understood that the conditions imposed

upon the company by the authorities prevailing at the time would not be changed before the public spirit and enterprise of the company had received return through the building up of the territory benefited. This thought is admirably expressed in the following quotation taken from the article entitled "The Public Service Commissions Law of New York," written by Thomas Mott Osborne, a member of your honorable commission, and published in the *Atlantic Monthly* of April, 1908:

"Without the railroads modern commerce would be impossible; without the street railroads our cities could not spread their vast populations out into their ever-growing suburbs, and social conditions would be completely altered; . . . all of these public utilities are vital elements in the lives of every one of us, and a law which compels such a complete readjustment of their relations to the state on the one side and the public on the other is not merely radical, it is revolutionary."

The Public Service Commission has full power, under the law (Sec. 26) to compel the company to furnish such service and facilities as shall be safe and adequate, and in all respects just and reasonable.

The Public Service Commission has full power, under the law (Sec. 55) to control the issuance of securities, bonds, notes and other evidences of indebtedness of the character usually issued for capital account.

The commission having, therefore, control of the service and control of the issue of securities, should leave to the companies and their managers the discretion as to how they shall be enabled to furnish the service required and secure the funds therefor. The annual report of the corporation will always show how the officers have exercised their discretionary powers in this respect, and any abuse of such discretion could be corrected by the commission.

Even if workable, the initiation of a system containing the proposed accounts, or any similar accounts, should be postponed until some future day, to enable the railway company to harmonize, as well as can be, the theories under which street railways, as well as steam railways, have been operated to date, and the theory which it is thus proposed to inaugurate.

To summarize:

(a) The change within a very limited period of time from the usual method of street railway accounting whereby no direct charges for depreciation have been made to a system where all depreciation is cared for as by the proposed accounts is unnecessarily violent.

(b) Immediate full charges for depreciation of tangible property, without allowance for appreciation of good will and increased earnings, will necessitate higher rates of fare to enable the payment of a fair return upon the property used.

(c) The power of the Public Service Commission to control the efficiency of the service and the issuance of additional securities for capital account, is sufficient to protect the public interests against waste or capitalization of depreciation.

(d) Charges for depreciation should not be matters of specific accounting, but should be made as an entirety in the discretion of the board of directors, whose intimate knowledge of the condition and growth of the property will enable them to so regulate depreciation charges as to meet their and the corporate obligations, and to conform to the requirements of the law and of the Public Service Commission.

The International Railway Company respectfully suggests that the establishment of a permissive depreciation account whose character and amount shall be in the discretion of the board of directors of the railway company is all that ought in fairness to be now required, and all that any public interest can now possibly demand.

C. Gordon Reel, vice-president and general manager Kingston Consolidated Railroad, said he did not believe the system should be retroactive. Mr. Reel referred to the balance sheet account "judgments unpaid," which provided that when any judgment is rendered by a "court of competent jurisdiction" a liability should be set up in the accounts. He suggested that this be changed to "court of last resort," or that the language be modified so as to make

it unnecessary to take cognizance of any estimated amount until litigation had stopped. Mr. Reel also spoke of the cost of installing the proposed system, and said that he would like to have the fiscal year changed to the calendar year.

C. L. Campbell, auditor of the New York & Stamford Railway, urged that time be given in order that there might be reasonable familiarity with the system before it was made effective. He said that the company for which he appeared was one of those controlled by the New York, New Haven & Hartford Railroad, and he preferred to discuss the classification from the point of view of a class A road, as it would be more economical to adopt one system that could be used by all the electric lines under one ownership. Mr. Campbell suggested that the commission prescribe one classification of operating expenses with 25 to 40 primary accounts, and let the companies subdivide such accounts in their discretion. He did not know any practical method of setting up depreciation accounts. The company had maintained the property through renewals, the cost of which was charged to operating expenses. If the companies introduce depreciation accounts and cannot make correct estimates they are practically no better off than they were without such accounts. If the principle of adding charges for depreciation to operating expense is correct the commission, to be consistent, should set up appreciation accounts to cover the increase in value of real estate, good will, franchises, etc.

Mr. Campbell said he was of the opinion that if a company maintained its property in a high state of efficiency, as required by the commission, any wear and tear not made good by immediate renewals would be more than offset by appreciation which was not accounted for. However, if depreciation accounts were to be prescribed they should be made clear, and a distinction drawn between charges to those accounts and for repairs and renewals.

A point was raised by Mr. Campbell concerning the action of a municipality in ordering a railway to renew a paving which could have continued in use for a number of years, the change ordered by the city being due to the fact that it preferred another paving. Mr. Meyers said that the only present arrangement for treatment of an expenditure of that nature was to charge it to repairs. He said that the excess charge was in the nature of a tax and his preference would be that such charges should be set up as a debit account as governmental exactions and wiped out over a series of years.

A. L. Linn, Jr., general auditor of the Mohawk Valley Company, asked if all companies regardless of their gross annual revenue, could keep the primary operating expense accounts to be prescribed for class A roads. Commissioner Stevens said they could if they wished.

Mr. Linn asked whether the proposed capital accounts are practically identical with those to be promulgated by the Interstate Commerce Commission. Commissioner Stevens said it couldn't possibly be known, but his opinion was that the accounts were similar.

Mr. Linn asked to what extent it was proposed to carry out the requirement that a distinguishing mark shall be placed so that each entry in relation to a particular thing shall be designated in the same way as the first entry. Mr. Meyers said that the purpose was to identify the property in the accounts so that an examiner could identify the property.

The next inquiry by Mr. Linn concerned the purpose of the re-classification of the capital accounts as of June 30, 1907. Mr. Meyers stated that the purpose is to have the

capital accounts show all the changes since the commission took office.

It was recommended by Mr. Linn that the provision for amortizing discount on bonds prior to June 30, 1907, be eliminated. He said that it would be impossible to make a separation of the amounts with any degree of accuracy whatever.

The suggestion that the fiscal year be changed to the calendar year and that the Legislature be asked to authorize the change was made by Mr. Linn, but Commissioner Stevens said he would not give any assurance that the commission would favor or that it would not oppose this step.

Commissioner Stevens said that in making changes there were always difficulties to overcome and burdens for some. It was the desire of the commission in every way possible to consult the convenience of the companies so far as practicable and so far as was not inconsistent with the results it was desired to attain.

AFTERNOON SESSION

At the afternoon session E. F. J. Gaynor, auditor of the Interborough Rapid Transit Company, said that there had been a number of conferences between auditors in New York City of lines operating wholly or in part in the First District. The auditors were willing to submit whatever suggestions they had to make in the remarks of Howard Abel, comptroller of the Brooklyn Rapid Transit System.

STATEMENT OF HOWARD ABEL, REPRESENTING NEW YORK CITY LINES

The following statement was then made by Mr. Abel:

The proposed uniform system of accounts of street and electric railways, prepared for the Public Service Commission of the State of New York, dated July 6, 1908, and upon which a hearing was had before Commissioner Eustis in the city of New York, on July 23, 1908, and adjourned to Aug. 4, 1908, at Albany, N. Y., is objected to on the ground that the proposed system is designed to take effect in part on July 1, 1907, notwithstanding the provisions of Section 46 of the Public Service Commission's law requiring that notice of any alteration in the method of keeping accounts of common carriers, railroad corporations and street railroad corporations should be given by the commission to such corporations at least six months before the expiration of any fiscal year; which required notice the larger street railroad corporations would be compelled to ask the Public Service Commission to grant in order to prepare the forms of accounts, records and memoranda necessary to be kept by the various departments, even though the law had not so prescribed.

The classification as prepared is not one that could be made retroactive, as much of the information therein called for could not be obtained after the work had actually been performed, and were it possible to rearrange the accounts so as to comply with the proposed system of accounts it would require the employment of a special force of competent accountants to do the work, as the volume is now so great on account of the frequent demands made upon the corporations under the jurisdiction of the Public Service Commission, from one source or another, that the ordinary work has to be done in many instances outside regulation office hours; this on account of the impossibility of assigning more than a given number of men to a certain piece of work, and from the further fact that the books from which the data would have to be taken are in use for current purposes nearly every hour of the day.

The extent to which the proposed system of accounts should be modified is set forth in the following criticisms and suggestions:

Attention is called to the division of carriers by classes as follows:

CLASS	ANNUAL GROSS REVENUE
A.....	\$500,000 and over.
B.....	\$100,000 to \$500,000.
C.....	Under \$100,000.

It is considered that this classification places an unfair

burden upon the small carriers which would be more fairly distributed if the classification as proposed by the Interstate Commerce Commission in the tentative classification of accounts for electric railroads which was recently promulgated was followed, the same being

Class A.....	\$1,000,000 and over.
B.....	\$250,000 to \$1,000,000.
C.....	Under \$250,000.

According to the example on page 7, in the classification proposed by the Public Service Commission, if the building estimated at \$15,000 on which there was expended \$3,000, making a total of \$18,000, had a replacement value of \$30,000, it is assumed there would have been no charge to operating expense, as the capital account would not be deemed to be impaired; but since the estimate of replacement value is \$16,000 operation must bear the burden of \$2,000. Uniformity in accounts under such circumstances hinges very largely on uniformity in judgment of appraisers.

That provision on page 7, which requires that the first entry in respect of any particular thing shall describe it with such particularity as to enable its identification, and the giving thereto a distinguishing name, number or other designation by which it shall thereafter be designated in every entry in any capital account which in any way concerns it, is impracticable.

Take, for instance, motors and controllers. There would be no difficulty whatever in recording the acquisition of motors of a given type or controllers of a given type and identifying them as such, but to name, number or otherwise designate, so as to enable the identification of any particular motor or controller would not be possible without going to the manufacturer of each piece of apparatus and having some designating name or number cast or otherwise affixed to the apparatus so that it could never be obliterated.

Page 8, Account No. 1, "fixed capital account: June 30, 1907," "unamortized debt discount and expense" and "unamortized discount on stocks outstanding." If debt discounts previously capitalized are to be transferred to a suspense account and absorbed during the life of the debt (which in some cases may be one or two years) within which the charge would require to be absorbed and in other cases an immediate charge to surplus account (where the debt had already matured, in respect of which the discount was incurred) then it would seem that provision should be made for charging to suspense and crediting back to surplus discounts heretofore charged directly to surplus account at the time of creation of the debt, less, of course, the accrued portion. Unless this be permitted, then debt discount transactions antedating July 1, 1907, should not be interfered with.

This latter suggestion would seem the most equitable to all concerned inasmuch as many of the present corporations are the result of reorganizations and the stocks and bonds at present outstanding have been issued either at par for the property, or sold to bankers at a discount, for cash, and cash paid for the property, the one method resulting in the discount being shown in the accounts, and the other method reflecting no discounts.

Under such circumstances the proposed method of segregating debt discounts and charging them off during the life of the debt will not operate uniformly on all corporations as, according to their past method of issuing securities, viz., for cash, at a discount, or for property, at par, they would have to carry or be relieved of the burden of making adjustments row on the basis outlined in the proposed system of accounts; hence account No. 1, page 8, should be modified by striking out from the word "date" on the sixth line to and including the word "given" on the thirteenth line.

Account No. 25, "transmission system." Add after "transmission system" "high tension." Account No. 26, "distribution system." Add after "distribution system" the words "low tension." After the word "energy" in the fourth line, strike out words "from power stations to" and substitute "between power and."

Account No. 41, "special high tension structures at stations." Insert before the word "currents" in the third line the word "alternating" and strike out after the word "currents" the words "having a tension of 13,000 volts and up-

wards." Account No. 42, "special high tension transmission equipment." Make same correction as in account No. 41.

Under the note "undistributed expenditures," on page 19, strike out after the word "the" in the third line the words "termination of the period of any construction" and substitute the words "end of each fiscal year." Strike out after the word "accounts" in the sixth line the words "in respect of such construction."

Account No. 56, "interest during construction." Strike out entire paragraph after the word "charged" in the first line and substitute the following: "interest on any moneys paid in respect of any construction from the date of such payment to the date when property becomes available for operation."

Page 24, "materials and supplies." Strike out commencing with the word "any" in the seventh line the balance of the paragraph.

Page 27, "cash assets." Strike out the word "assets" after the word "cash." Interline after the word "credits" in the eighth line the words "and drafts" and strike out the balance of the paragraph, after the word "order" in the last line but one, and add: "This account shall be credited with all cash disbursements of the corporation. "Bills receivable." Insert after the word "includes" in the third line the words "time and demand" and commencing with the word "draft" strike out to and including the word "assets."

Page 29, "unamortized discount on stocks outstanding." Strike out entire paragraph relating to "unamortized discount on stocks outstanding."

Page 31, "judgments unpaid." As judgments are not a liability until determined by a court of last resort, substitute the words "last resort" in lieu of the words "competent jurisdiction" contained in the second line of this paragraph.

Page 32, "bills payable." Strike out second paragraph commencing with the words "the account bills payable," same being superfluous and misleading.

Page 32, "premiums on stocks outstanding." Suggest substitution of the word "issued" for "outstanding." Same as to sub-headings.

Page 33, "unvouchered items." The account reflects a degree of refinement in accounting particularly burdensome to electric railways and appears unnecessary where every effort is made by a corporation to voucher its bills promptly, and as it is not required of the steam roads of the country by the Interstate Commerce Commission's classification it is objected to in this classification as imposing an undue burden. If carried to a logical conclusion the necessity would exist for obtaining statements of all contractual obligations of the company and setting up a liability for such in this account. Although the theory of obtaining an absolutely correct statement of the condition of affairs of a corporation at any given period is recognized as a correct one, it would require a complete suspension of operations in order to ascertain such.

Page 34, "unamortized premium on debt." We suggest as a substitute for the account "unamortized premium on debt" the title "unearned premium on debt."

"Casualties reserve." This is objected to on the ground that the amount of liability is impossible of reasonable estimation, and to be required to set aside a reserve for each accident would involve an endless task and the opening of an individual ledger account for every accident, and recording an expression of judgment which might be used against the corporation. We suggest that all payments on account of accidents occurring prior to July 1, 1909, be charged to profit and loss, and all payments made on account of accidents occurring subsequent thereto to be charged to "damages or casualties reserve," to which account there shall be credited each month one-twelfth of an estimated annual amount based upon the next preceding year or such other greater or less amount as the circumstances demand.

Page 35, "repairs reserve." It is provided that the corporation shall be allowed upon notice being filed with the Public Service Commission as follows: "Corporations and persons intending to follow the practice of charging to repairs account and operating expenses the estimated repairable wear and tear shall, prior to beginning such practice, file a notice of such intent with the Public Service Com-

mission." It is requested that this rule be amended to permit corporations to include each month a proportion of the total amount estimated for repairs during the fiscal year regardless of month in which actual repair is made or accrued. This practice is also in line with the provision of the Interstate Commerce Commission prescribed for steam roads in respect to renewals; also in the tentative classification prepared by the Interstate Commerce Commission for the use of electric roads.

Account No. 20, "poles and fixtures." We suggest substituting for the word "shall" in the third line of the footnote, as also in the last line thereof, the word "may." Account No. 22, "transmission system." We suggest adding to the title of this account the words "high tension." Account No. 23, "distribution system." We suggest adding to the title of this account the words "low tension."

Account No. 25, "repairs of buildings and structures." The footnote to this paragraph should be modified by substituting for the word "should" in the second line and for the word "should" in the third line the word "may."

Account No. 28, "depreciation of way and structure." In the absence of recognized authorities for determining the percentage of efficiency of ties, rails, rail fastenings, poles, fixtures and the like, accounting on the basis indicated would be inaccurate, misleading and so burdensome to the corporation as to become financially disastrous. The principle of depreciation is recognized when applied on practical lines and when the amount reserved for such purposes is available for piece-meal renewals and when not required to be held for complete replacement, or as is suggested in this account, to be held indefinitely on the theory that 50 per cent depreciation exists. The formula prescribed in this connection is also objected to on the ground that it is at variance with the requirements of the Interstate Commerce Commission and not required from steam railroads.

"Depreciation of equipment." Account No. 44. The principle of depreciation in equipment is recognized. The method of enforcement as provided in this classification is cumbersome and impracticable and since no provision is made for drawing out of the proposed reserve on account of partial replacements, the application of the principle as laid down would prove disastrous to nearly all street railway carriers, as invariably the corporation is limited by a contract or ordinance requirement to carry passengers for a fixed rate of fare with no possibility of increasing the rate, whatever the cost of operation is found to be, actually or theoretically. Improvements would be rendered prohibitive. We suggest that any charge made to this account be based on types of equipment rather than individual units, and that whenever any unit of equipment of a given type is retired from service the capital impairment be charged against such reserve, with permission to transfer from one reserve to another, as the exigencies of the case may require.

Account No. 56, "jointly produced power." The text of this account does not indicate to what account profits are chargeable.

Page 70, "taxes." Inasmuch as tax bills do not show the tax on land and tax on improvements separately we suggest that corporations be permitted to report these two items collectively.

Page 71, "miscellaneous rent revenues receivable." We suggest striking out the word "receivable."

Accounts "rent expense," "interest expense," "dividend expense," "others' operations expense" and "non-operating taxes." We suggest the elimination of these accounts and charging such items as are therein provided to be charged directly against the corresponding revenue accounts so as to avoid unnecessary inflation of earnings and expenses.

Page 75, "interest accrued on debt and stocks." In order to avoid confusion between debit and credit accounts we suggest eliminating from the caption of the account the word "accrued," with similar modification as to each of the sub-accounts.

Page 77, "loss of operations of others." We suggest that this be eliminated and items covered by the text of this account charged to "profits from operations of others" shown under non-operating revenue accounts on page 73.

Page 79, "expenses elsewhere unprovided for." Should not some other word be substituted for the word "campaign"?

Page 81, schedule C. We suggest eliminating from this schedule "car seat miles," as such information is of value only to steam railroad companies where the distance traveled by its passengers may be computed from the sale of tickets. In the case of street railroads, where the known distance traveled is not determinable, the seat mile statistics could have no value as affording a basis for comparison between the car mile seating capacity and traffic congestion for the reason that the same seat may be occupied a number of times while the car is en route and for the reason that no two lines are comparable in point of character of traffic; and the further fact that on certain lines traffic is uniform in each direction, while on other lines there is a heavy wave of travel in one direction in the morning and in the reverse direction at night with scarcely any riding in the opposite direction to the wave of travel morning or evening.

In conclusion, it is our opinion that the proposed system of accounts without substantial modifications is not susceptible of practical application and to the extent to which the same is feasible, it would be costly to maintain, and that the text of some of the accounts is stated in such ambiguous terms as to be incomprehensible without minute study of the classification. The resultant income account and balance sheet contain so many new and heretofore unheard of account definitions that a layman would have difficulty in deciphering the import of either.

In view of the high standard of up-keep enforced by the Public Service Commission, deterioration cannot be allowed to run to a point where complete renewal or replacement will be necessary; hence, under the scheme of amortization of capital provided for, a conscientious effort to comply in letter and spirit with the text of this would require writing off to expense an amount during the life expectancy of each class of property equivalent to its cost; the reserve in many cases being more than the surplus earnings. The corporations would be compelled to continue making these reserves and would not be able to draw them down for piece-meal replacements as, until property is completely replaced, the reserve is not available. Such piece-meal replacement or reconstruction would give an indefinite life to some classes of property and the result would be an excessive burden on operation and misleading results.

The enforcement of such theoretical reserves for depreciation, resulting in apparent deficiencies, when actual surplus earnings have been made, will end in costly litigation through the enforcement of this method of accounting by the Public Service Commission on the one hand, and by the stockholder on the other suing for his dividends, unless such step on the part of the stockholder be rendered unnecessary by receivership proceedings through the enforcement of the bondholders' rights. Such a procedure would simply be a forerunner of the same disintegration as has been witnessed in the city of New York, borough of Manhattan.

A. B. Bierck, auditor Long Island Railroad and electric railways controlled by that company, said he wished to add a few remarks to the criticism in which he had joined. He said that it was not possible for an accountant to determine the amount of irreparable damages and estimate obsolescence. He discussed the proposed requirement that the discount on bonds be wiped out, and said that real estate in payment for which bonds had been issued two or three years ago might have appreciated 50 to 100 per cent. The system was faulty in that it provides for taking up the discount on bonds, but not for actual depreciation in property.

Mr. Linn said there seemed to be some difference of opinion as to what constituted funded and unfunded debt. Mr. Meyers said the determining consideration was the time. The commission fixed on one year, because if the period before maturity is longer the commission must authorize the issue of bonds before it is legal.

The account "unvouchered items," Mr. Linn said, was correct in theory, but it would be a task to set up items where bills had not been received and the accounting de-

partment was not advised as to the cost. Mr. Meyers said that this account was based on the practice of A. H. Plant, comptroller of the Southern Railway, who had said that the directors of that company found it very useful on that system.

Mr. Linn also spoke about the proposed "casualties reserve."

Mr. Meyers said he thought the account was worded in such a manner that it gave the companies the option of charging in their operating expenses when the accident happens or when judgment is rendered.

Mr. Linn said that the practice of the companies he represented was based on the experience of previous years. The companies charge a percentage of their gross earnings. This is carried to an account against which all claims on account of injuries and damages are charged.

Horace E. Andrews, president of the Mohawk Valley Company, added that if a deficit was shown one year, the rate of percentage was raised during the next year.

Mr. Andrews said that in the valuation of the property of the Cleveland Electric Railway it was found that the value of the real estate had increased very rapidly. He thought that the principle of accounting for appreciation should be adopted in some reasonable way.

C. W. Hinkley, of the Poughkeepsie City & Wappingers Falls Electric Railway, stated briefly his objections to the classification.

In response to a question from Mr. Davies, it was stated by Mr. Meyers that until some standard of practice has been developed the manner of treatment of the depreciation companies will have to be left largely to the discretion of the companies.

Commissioner Stevens said that the commission announced its position regarding depreciation accounts in a letter sent last December to Prof. H. C. Adams, in charge of statistics and accounts for the Interstate Commerce Commission. In that letter the commission said that it would prescribe depreciation accounts for all classes of property subject to depreciation. Commissioner Stevens said on this subject:

That announcement the commission has no desire to change, and, on the contrary, experience confirmed the commission in the opinion that it announced doctrines that are sound and cannot successfully be disputed. You will note that the commission recognizes the difficulty of establishing depreciation accounts. The arguments to-day have been heard with the greatest interest. The commission is not disposed, however, to feel that particular accounts may be eliminated because of exceptional cases. The fundamental principle of the accounts is that they should reflect so far as possible actual conditions. There are a considerable number of companies that are suffering worse agonies than any depicted here because of a failure to provide depreciation accounts. When it is the case that bondholders must put their hands into their pockets in order to rehabilitate the property it is evident that a wrong system exists. It is a question of fact, not of law. But the fact to remember is that property after property subject to the jurisdiction of the commission has proceeded in utter defiance of the fact that depreciation would come to pass. It has been in certain companies a condition of financial chaos. It has been said that the depreciation accounts are rather vague and rather indefinite; in my judgment they are extremely unsatisfactory in some respects. We don't want to lay down hard and fast rules. This has to be a matter of discretion and judgment, but at some time or other a start has to be made. It has been argued that appreciation would counterbalance depreciation. Up to a certain point that must be true, but at a certain point it must stop. On the details of the accounts and how they shall be carried on for the first few years the commission seeks all the light, but as to the introduction of depreciation accounts its policy is fixed.

Morris Cohn discussed the appreciation in the value of franchises, which, he said, belonged to the companies. Commissioners Stevens said that personally he differed with the speaker on that point.

Commissioner Stevens and Mr. Meyers both stated that they would appreciate suggestions regarding any features of the accounts. The hearing was then adjourned.

SIX-CENT FARES UPHELD BY MASSACHUSETTS RAILROAD COMMISSION

The Massachusetts Railroad Commission has decided that a 6-cent fare is reasonable in the cases of the electric railways of the Newton group which have been pending before the board for several months. The companies affected are the Newton Street Railway Company, the Natick & Cochituate State Railway Company and the Middlesex & Boston Street Railway Company, all of which are controlled by the voluntary association known as the Boston Suburban Electric Companies. In connection with its study of the problem the board has considered, among other questions, the cost of power, labor and materials, salaries, existing indebtedness, general operation, maintenance, improvements, immediate and prospective demands for service, new equipment and possible extensions. Figures showing capitalization, receipts, etc., have been analyzed.

The protests were from the board of selectmen or residents of Wellesley, Natick, Hopkinton, Framingham and Ashland, and there have been several largely attended hearings which have been reported in these columns. The protestants claimed that the companies could prosper without raising the fares, so that the commissioners gave considerable detail as to the company's finances, based on information furnished to the commission officially. The report follows:

THE COMMISSION'S REPORT

A system of street railway, including the Newton, the Natick & Cochituate and the Middlesex & Boston companies is controlled by a voluntary association, known as the Boston & Suburban Electric Company, which holds as a stockholder the majority interest in these properties. In discussing the relations of the holding company to these roads, the board, May 25, 1904, made this statement:

"What those who are thus associated do with the dividends which they receive from their shares in railway stocks or what value they place upon such shares is of no more importance to those who use these railways and pay the fares which support them than if the controlling stockholder were an individual. The board deals only with the capitalization of the railway companies, their methods of constructing, maintaining and operating their railways and the corporate receipts and expenditures. That a common ownership and management makes the several Newton railways to all intents and purposes parts of one local system is a fact to be given due weight."

In conformity with the principle there stated, the board in the cases now before it has reviewed the capitalization of the companies and has made a renewed study of their construction, maintenance and operation and an analysis of their receipts and expenditures.

Every street railway company serving the public in this State is a Massachusetts corporation, required by law to return yearly a sworn statement of its financial condition on forms approved by the board. No capital stock can be issued, no location be granted and no section of track be operated except by virtue of these laws, wisely safeguarded in the public interests.

The board, in connection with its study of the whole situation, has given particular attention to certain questions which it deems essential to a true and correct understanding of the issues before it. Among these are the cost of power, or labor and materials, salaries, existing indebtedness, both floating and funded, general operation, mainte-

nance, improvements, immediate and prospective demands for service, new equipment and possible extensions. Figures showing capitalization, bonded and unfunded debt, earnings and incomes, have been taken from orders of the board and returns of the companies, and comparative tables of gross passenger receipts have been furnished upon our application by the companies.

These companies together serve a territory considerable in extent and of varied density of population. The service rendered is in part exclusive and in part competitive. The fares are now established at a six-cent unit upon all the lines of this system, with the exception of the Newton Street Railway, upon only one branch of which this fare is in operation. The companies are intelligently operated and as a whole render a reasonably efficient service to their patrons.

The Newton Street Railway Company may be said to be fairly successful, if such a term can rightfully be used in connection with any of these companies. Its capital stock is \$722,000; its funded debt \$575,000, and unfunded liabilities \$518,454.09. The return of the company for the year ending Sept. 30, 1907, discloses:

Gross earnings from operation.....	\$357,588.62
Operating expenses.....	268,531.31
Gross income above operating expenses.....	\$89,057.31
Less fixed charges (interest and taxes).....	68,643.53
Net divisible income.....	\$20,413.78

A statement of the earnings of the company for the five years, 1903-1907, is as follows:

	Capital Stock.	Net Divisible Income.	Divs. Paid.	Deficits.
1903.....	\$315,000	\$5,217.46	6%	\$13,682.54
1904.....	722,000	10,734.15	*2	10,005.85
1905.....	722,000	30,497.26	3½	.....
1906.....	722,000	41,196.68	5	.....
1907.....	722,000	20,413.78	2½	.....

*2% on \$315,000; 2% on \$722,000.

The Natick & Cochituate Street Railway Company has a capital of \$100,000, no funded debt, and unfunded liabilities of \$213,843.90. The return of the company for the year ending Sept. 30, 1907, discloses:

Gross earnings from operation.....	\$100,078.05
Operating expenses.....	83,298.01
Gross income above operating expenses.....	\$16,780.04
Less fixed charges (interest and taxes).....	14,766.53
Net divisible income.....	\$2,013.51

A statement of the earnings of the company for the five years, 1903-1907, is as follows:

	Capital Stock.	Net Divisible Income.	Dividends Paid.
1903.....	\$100,000	\$8,107.53	8%
1904.....	100,000	1,345.95	2
1905.....	100,000	*1,702.41	.
1906.....	100,000	8,389.88	6
1907.....	100,000	2,013.51	2

*Deficit.

The average dividend of the company for the five-year period is 3.6 per cent.

The Middlesex & Boston Street Railway Company has a capital of \$300,000, an amount fixed by the board as not exceeding the fair cost, as determined by it, of replacing the railway and property acquired at receiver's sale of the South Middlesex Street Railway, less the amount of its funded debt, \$100,000. The return of the company for the six weeks ending Sept. 30, 1907, naturally affords little assistance, and we have therefore examined the returns of the South Middlesex Street Railway Company in connection therewith. This return discloses that for the five-year period before reorganization of the company no dividends were paid.

The Newton Street Railway Company alleges that it is necessary to increase its income by some change in fares and that "to make such change as light a burden upon the traveling public as possible, and to distribute it as equitably as possible, it is proposed to make every fare in connection with which a transfer is secured from one car or line of cars to another six cents"; and petitions the board for approval of such change in fares in so far as it constitutes to any degree a withdrawal or discontinuance of the use of free checks or free transfers. This petition in effect is an application to the board to adjudicate that the charge of one cent for each transfer issued by the Newton Street

Railway Company for use upon its own or connecting lines is reasonable.

The approval of the petition for withdrawal of free transfers will not result in the raising of the fare on the principal lines of travel, namely, between Lake Street and Norumbega Park, Newton and Newton Lower Falls, and Newton and Waltham. It will result only in the raising of the fare from five to six cents for a continuous ride in connection with which a transfer is issued. The company will alone receive the benefit of this increase whenever a transfer is issued from one portion of its line to another, and will receive the benefit, in part, whenever a transfer is issued from its lines to those of companies with which it has transfer arrangements.

Upon all the facts before us, we are unable to adjudicate this proposed charge unreasonable or excessive. A statement requested of the company showing gross passenger receipts from Oct. 1, 1907, to July 27, 1908, inclusive, follows. The gross passenger receipts for 27 days in July, as an indication of summer riding, are significant:

GROSS PASSENGER RECEIPTS, NEWTON STREET RAILWAY COMPANY.

	1907-8.	1906-7.
October.....	\$28,632.07	\$27,624.21
November.....	26,781.86	24,383.26
December.....	25,235.50	24,135.66
January.....	23,819.66	22,396.65
February.....	22,497.73	20,381.30
March.....	24,433.88	23,868.95
April.....	26,007.07	24,017.50
May.....	32,516.11	28,697.77
June.....	42,486.97	40,115.15
July*.....	35,931.36	39,270.40
Totals.....	\$288,342.21	\$274,886.91
Less receipts of Highlands Line, November to July.....	10,045.94	
Total.....	\$278,296.27	

*Twenty-seven days.

Highlands line operated in 1906 by Newton & Boston. Now being operated by the Newton Street.

We have therefore determined to approve a withdrawal of free transfers on the Newton Street Railway for a limited period as an experimental measure, being of the opinion that at the end of this period or prior thereto, if conditions should warrant and unless unexpected loss of business necessitates a further extension of time, the company should restore the free transfers. We take this course that the company, rather than the public, may carry the burden of bringing this matter formally before us in the event of an occasion arising for such action.

The petitions before us, other than that of the Newton Street Railway Company, relate to the reasonableness of the rates now charged by the Natick & Cochituate Street Railway Company and by the Middlesex & Boston Street Railway Company.

It becomes important to ascertain, if possible, the approximate prospective earnings of these companies with the six-cent fare in operation, and the board has requested of the company a detailed statement of gross passenger receipts since the increase, together with comparative tables for 1907. For the four completed months the returns are as follows:

NATICK & COCHITUATE STREET RAILWAY COMPANY.

	1908.	1907.	Decrease.	%
March.....	\$7,103.42	\$7,536.73	\$433.31	5.75%
April.....	7,301.28	7,664.04	364.76	4.73%
May.....	9,028.38	8,486.60	*541.78	6.38%
June.....	10,442.03	10,146.96	*295.07	2.91%

*Increase.

MIDDLESEX & BOSTON STREET RAILWAY COMPANY.

	1908.	1907.	Decrease.	%
March.....	\$6,468.57	\$6,773.69	\$305.12	4.50%
April.....	6,748.81	7,020.41	271.60	3.87%
May.....	8,045.67	7,822.22	*223.45	2.86%
June.....	7,979.16	8,119.78	140.62	1.73%

*Increase.

While these returns show a loss in the gross passenger receipts under the increased fare upon both roads, the board, in view of the suggestions at the hearing of the importance of ascertaining the so-called summer or vacation riding, with which suggestion it is in accord, has requested and received a statement of the comparative gross receipts for transportation for 27 days in July, showing a continued and marked decrease, which are as follows:

	1908.	1907.
Natick & Cochituate Street Railway Company.....	\$7,862.16	\$8,460.95
Middlesex & Boston Street Railway Company.....	7,195.50	7,442.65

A street railway company may establish rates of fare for all passengers transported by it. If the board is of opinion that the rates of fare so established are excessive or unreasonable, it may recommend a reduction thereof to the company.

The affairs of the Natick & Cochituate and the Middlesex & Boston Street Railway Companies taken as a whole do not warrant a lessening of receipts. The board therefore is of opinion that it ought not to recommend to either of these companies a reduction in existing rates of fare for passenger transportation.

In reaching these conclusions, we have given careful consideration to the suggestion that other methods ought in the first instance to be adopted by the companies in attempting to secure additional necessary income. The methods outlined, in the opinion of the board, are neither feasible nor in the public interest. Where conditions like the ones before us prevail, the interests of the whole public are and ought to be controlling factors in our determination. To find otherwise is to outrage that spirit of fairness which should underlie every recommendation that the board is called upon to make.

It is therefore ordered that the petition of the Newton Street Railway Company be granted for an experimental period of one year from the date hereof, and that the remaining petitions be dismissed.

For the Board,
(Signed)

CHARLES E. MANN, Clerk.

TESTS ON FUEL FOR GAS PRODUCERS

A forthcoming bulletin of the United States Geological Survey will contain an exhaustive report of the tests conducted at the fuel-testing plant in St. Louis, Mo., and Norfolk, Va., on the gas producer. An interesting feature of the report will be the behavior of a certain bone coal from West Virginia in the producer. This fuel was considered of little or no value for steam-boiler work, yet showed considerable usefulness in the gas producer, developing at the engine a brake hp per hour for 1.65 lb. of coal. By permission of the director of the Geological Survey an abstract of the results with this fuel are presented herewith:

This coal was delivered on the producer platform in lump form up to 8 in. or 10 in. in size. The coal crusher not being available at the time, necessitated breaking the large lumps with a hammer. The character of the fuel was rather peculiar; some of the lumps consisted almost entirely of what appeared to be a high-grade bituminous coal, others seemed to be nothing more or less than rock, heavy, hard, and when hit in the dark with a hammer numerous sparks could be readily seen. Again there were many lumps of this rock-like substance to which adhered much good coal. In the producer all of these lumps when not too large would burn entirely through. The fuel had no tendency to clinker or coke and worked exceedingly well, needing scarcely any poking. It contained a very high percentage of ash, about 45 per cent, thus causing the ash bed to increase in thickness very rapidly, and throughout the test this fact was not properly appreciated. Consequently much of the time during the test the ash bed was too high for best results. The fact that the coal had to be broken by hand and that it was unusually hard and rock-like had a tendency to allow lumps of coal much too large to be charged into the producer. These large lumps, very high in ash, did not burn entirely through; as soon as the burning was well started, a layer of ash formed around the lump, interfering with the combustion of the remaining portion, and before it had time to burn it had passed out with the ashes unconsumed. Because of the general appearance of the coal but little was expected of it, and the test was started with only partial load. After several hours' run,

however, the results warranted full load on the engine. After 39 hours of full load the accumulation of ash in the producer caused a little trouble; the gas went down in heat value and it was necessary to reduce the load to about 9 per cent of full load. After much grinding down of the ash bed and special care in breaking up the lumpy coal, the gas began to increase in heat value, and at the end of the test the producer was again in shape to maintain full load at the engine. The calculations for the test are based on the 50 hours taken from the time full load was carried by the engine, and for this period the gas averaged 144 b.t.u. per cubic foot, with an average load of 97 per cent of full load.

The following is the result of the test on the West Virginia bone coal:

PROXIMATE ANALYSIS OF THE COAL.

Moisture	0.47
Volatile matter.....	8.83
Fixed carbon.....	46.96
Ash	43.74
Sulphur	0.27
	100.00

COMPOSITION OF GAS BY VOLUME.

Carbon dioxide (CO ₂).....	9.7
Carbon monoxide (CO).....	19.5
Hydrogen (H ₂).....	16.6
Methane (CH ₄).....	1.6
Nitrogen (N ₂).....	52.6
	100.00

Duration of test, hours.....	50
Coal consumed in producer, as fired, lbs. per hour.....	378
B.t.u. of coal as fired.....	8,566
Standard gas per lb. of coal consumed in producer, cu. ft.....	44.1
Efficiency of conversion and cleaning gas.....	74.1
*Electrical brake hp developed at once.....	288.8
Coal per brake-hp hr. developed at engine, lbs.....	1.65
*Based on an assumed efficiency of 85 per cent for generator and belt.	

TURBINE LUBRICATION

BY A LUBRICATION EXPERT

About two years ago a large power company began to install several horizontal turbines, the first two units being of 7500-kw capacity each. No lubricant especially adapted to turbines had been offered to the company at that time, so the station engineers chose a dynamo oil of such light gravity that it would allow any foreign matter to settle rapidly. The turbines received oil through a 3-in. pipe at about 2 lb. pressure from individual tanks which were of 7-bbl. and 13-bbl. capacity, respectively. It was soon found that this service was extraordinarily hard since the oil flowed so rapidly through the turbine bearings that it did not have time to settle or cool in the tank. Shortly after starting the turbine with the larger oil tank it was noticed that the oil had become very dirty, due to molding sand from the tank, which had not been thoroughly cleaned out. After this sand had been removed the turbine was started on a fresh supply of oil. It was then operated constantly for nine months, or until the turbine shut down, with the initial supply of oil except for such additional oil as was required to make up for leakage.

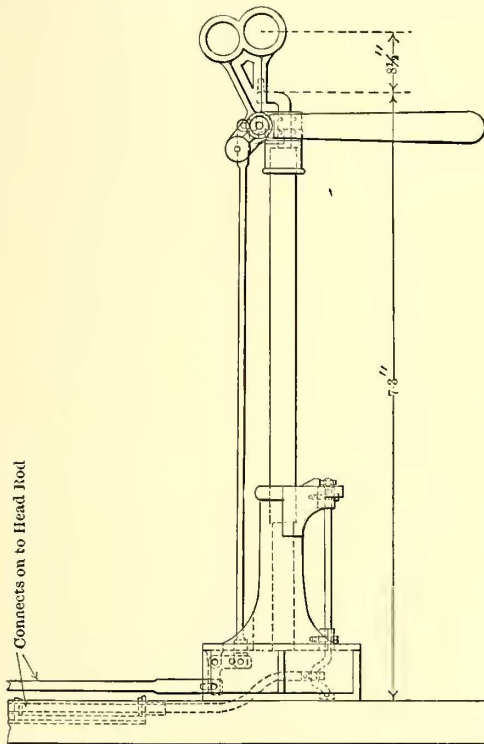
Moisture or dirt in oil causes a rapid discoloration which disappears very slowly. Should the oil contain the least moisture it will become milky on being placed in service and if allowed to stand long enough a white sediment will appear in the bottom of the receptacle. This sediment does not interfere with the lubricating qualities of the oil nor is it a detriment to the successful lubrication of the steam turbine.

To prove that entrained moisture was the cause of the discoloration in a particular case, an 8-in. x 5-in. x 12-in. steam pump was filled with 25 gal. of oil and fitted with a return pipe to form a circuit between the inlet and outlet of the pump. The oil was then pumped around this circuit

as in a turbine lubrication circuit, but, of course, the service in the turbine is harder on the oil. The pump test showed no discoloration of either the dynamo oil first used or of the turbine oil tried later, while one pint of water added to the 25 gal. of either oil was sufficient to create an emulsion. The precipitation in the turbine was very much heavier than that in the dynamo oil and settled in about one-tenth the time. Eventually the turbine oil was chosen for its lower cost.

SAFETY SWITCHSTAND OF THE DETROIT UNITED RAILWAY

John Kerwin, superintendent of tracks, Detroit United Railway, Detroit, Mich., has developed and put into use a new switchstand of the form illustrated. This switchstand is designed and built to be used on trailing spring switches. In various parts of the country there have been accidents on electric railways brought about by a stone or a bolt dropping between the main track rail and a switchpoint, thus causing the point to remain in a partially open position and derail the next car passing in the opposite direction. The more frequently used types of signals and switchstands placed at trailing spring switches are misleading to a motorman because they will show "clear" when the switchpoint is not held tightly against the main rail. This is because there is not a solid connection between the



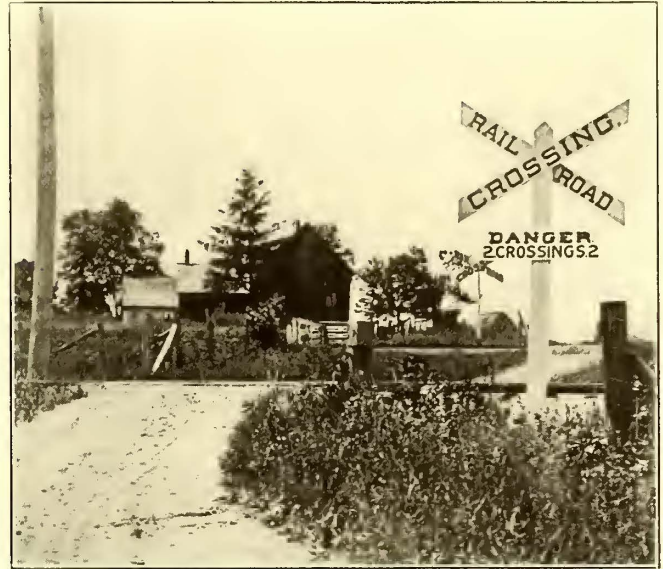
Detroit Safety Switch Stand

signal and the switchpoint. The new Detroit signal, however, is rigidly connected to the switchpoint. It can show only a clear line when the point is tight against the stock rail. This signal will drop to "danger" by a 3/8-in. movement of the switchpoint away from the main rail, setting the target at a horizontal position and placing the red lens opposite the bull's-eye of the lamps. The height of the blade is placed about 7 ft. above the ties, as illustrated.

The employees of the lines of the Ohio Electric Railway centering at Lima, Ohio, held their first annual outing at Hover Park on July 30.

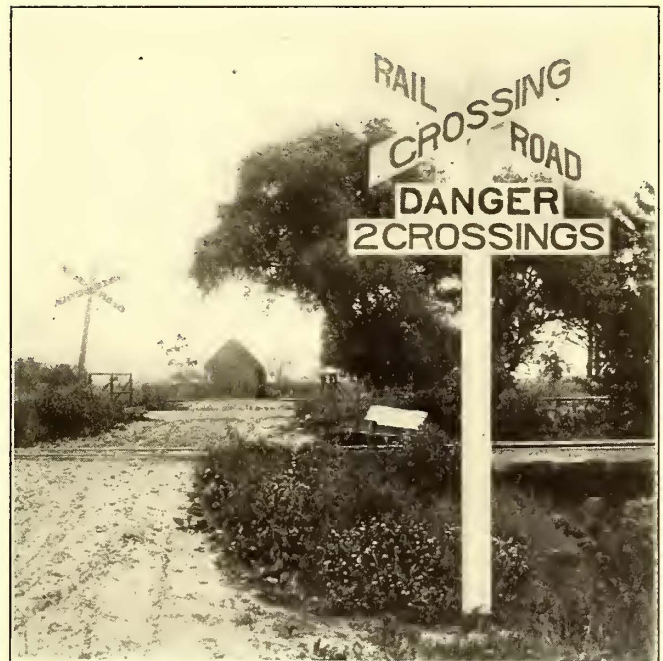
HIGHWAYS CROSSING PARALLEL ELECTRIC AND STEAM ROADS IN INDIANA

Accident Bulletin No. 4, published by the Railroad Commission of Indiana, contains two photographs of highways crossing rights-of-way of electric and steam railroads. The



Double Crossing Sign on the Terre Haute, Indianapolis & Eastern Traction Company

commission states in this bulletin that nearly all of the companies have adopted its recommended form of warning signal, which necessitates calling attention to the existence



Double Crossing Sign on the Evansville, Suburban & Newburgh Railway

of two crossings where an electric road parallels a steam railroad. Through the courtesy of Charles B. Riley, secretary of the Indiana Commission, the photographs have been furnished for reproduction in the ELECTRIC RAILWAY JOURNAL.

EXHIBITS AT THE ATLANTIC CITY CONVENTION

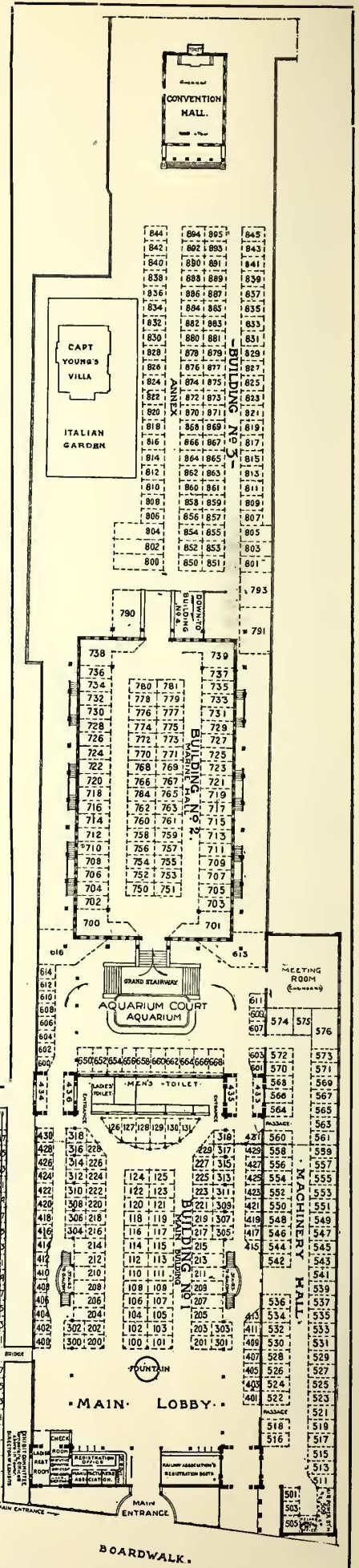
The American Street & Interurban Railway Manufacturers' Association has issued through its Exhibit Committee, of which Kenneth D. Hequembourg is vice-president in charge of exhibits, and H. G. McConnaughty, director of exhibits, a circular giving complete information regarding the details of the exhibits to be made at the coming convention, and a map of the pier showing the disposition of the different spaces. This plan is reproduced herewith. Booths 1-50 are on a temporary trestle adjoining the pier for car exhibits, 100-500 in the main building, 500-600 in Machinery Hall, 600-700 in Aquarium Court, 700-800 in building No. 2, 800-900 building No. 3 and 900-1000 in the building No. 4.

Applications for spaces are coming in very fast and Mr. Hequembourg says that more than two-thirds the space has already been applied for. The exhibit committee will meet within two weeks and at that time will assign the different spaces. Last year 200 exhibitors used 60,000 sq. ft. of exhibit space, but this year it is expected that 250 members will use upward of 70,000 sq. ft. of space. Every exhibit space will be provided with a complete booth with signs, carpet, etc., erected and ready for unpacking of the exhibit on its arrival. In addition to the uniform charge of 28 cents per square foot the exhibitor will have only to pay freight, carting, unpacking and installation of the exhibit. Further information in regard to this feature will be found in the circular. Mr. Hequembourg has arranged for an office for the Exhibit Committee at Room 1822, 299 Broadway, through the courtesy of the Dearborn Drug & Chemical Co.

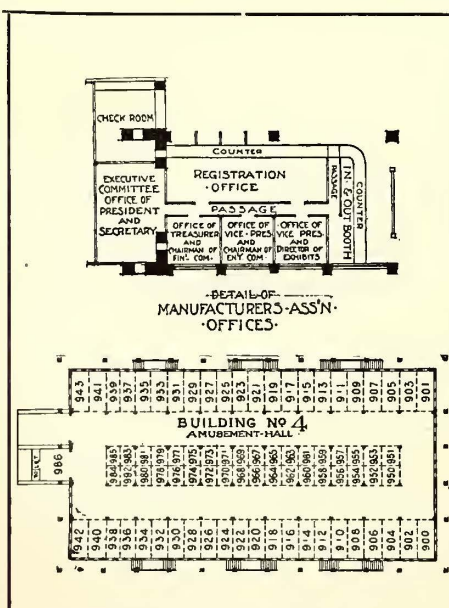
Special arrangements are being made by the association for caring for delegates to the convention. Directly back of the main entrance to the pier will be the Railway Association's registration booths and the Manufacturers' Association booth, the former on the right and the latter on the left. Back of that will be a lobby which will be specially decorated and arranged for the convenience of the delegates. There will be tables, writing paper, pens, ink and all the conveniences to be found at the hotels, and it is hoped the lobby will be made a general rendezvous.

A feature of the exhibits this year will be the provision made by the Manufacturers' Association for caring for car exhibits. Special tracks will be laid on the left-hand side of the pier and parallel to it. These tracks will be connected with the main building with a bridge. The exhibits here will be under cover and it will be possible to visit them without making a special trip, as has been the case heretofore. Formerly, because of the difficulties in transporting equipment to the exhibition pier, cars have been exhibited on the tracks of the local street railway company at Atlantic City. Arrangements have been made for transporting car exhibits at \$4 per ton, so that the cost, exclusive of freight and the charge for space, will be about \$100 for a 25-ton car.

Another feature that ought to be greatly appreciated is the "Whereabouts Register" at the In and Out Booth for registering the movements of members during the convention. The Manufacturers' Association will have at its booth at the entrance to the pier a number of clerks who will keep an index card system of the movements of delegates. Each person will have the privilege



SUMMARY OF BOOTHS.	
TRESTLE FOR CAR EXHIBITS	BOOTHS 1-50
BUILDING NO. 1 (MAIN BUILDING)	100-500
MACHINERY HALL	500-600
AQUARIUM COURT	600-700
BUILDING NO. 2 (MARINE HALL)	700-800
" NO. 3 (ANNEX)	800-900
" NO. 4 (AMUSEMENT HALL)	900-1000



Plan OF BOOTHS AND EXHIBIT SPACES YOUNGS MILLION DOLLAR PIER FOR AMERICAN STREET AND INTERURBAN RY ASSOCIATION CONVENTION OCTOBER 12-18, 1908.

ISSUED BY THE EXHIBIT COMMITTEE OF THE AMERICAN STREET & INTERURBAN RY. MANUFACTURERS' ASS'N.
 GEORGE HEKAN, SECRETARY
 K. D. HEQUEUMBOURG, VICE PRES. (EXHIBITS)
 H. G. MCCONNAUGHTY, DIRECTOR OF EXHIBITS

P. E. LANE, CONTRACTOR. SEWARD G. DOBBINS, ARCHITECT.

of filling out a card which will indicate where he will be until a specified time. This card will be filed and can be corrected at any time by a personal call at the booth, by phone or by messenger. White cards will indicate to the clerk that the information can be given to anyone inquiring, while a red card will show that the information is confidential and is to be imparted only to the names indicated in the lower corner of the card.

It is announced that the pier will be repainted and especially decorated for the convention. There are two convention halls on the pier adjoining the exhibits and at them, as previously announced, will be held all of the meetings of the American Association, the Transportation & Traffic Association and the Engineering Association. The meetings of the Accountants' Association for Thursday and Friday will be held at one of these halls.

With the approval of the executive committee of the Manufacturers' Association, Mr. Hequembourg has appointed the following gentlemen to act as an Exhibit Committee: L. R. Ashhurst, Jr., William Wharton, Jr., & Company, Philadelphia, Pa.; Charles S. Ayres, Electric Railway Equipment Company, Philadelphia, Pa.; E. H. Baker, Galena Signal Oil Company, New York, N. Y.; W. D. Brewster, National Brake Company, Buffalo, N. Y.; Dwight Dean, Kuhlman Car Company, Cleveland, Ohio; F. J. Drake, Lorain Steel Company, Philadelphia, Pa.; Thomas Farmer, Jr., Consolidated Car Heating Company, New York, N. Y.; F. H. Gale, General Electric Company, Schenectady, N. Y.; Benj. Hayllar, Westinghouse Electric & Manufacturing Company, Philadelphia, Pa.; John C. Jay, Jr., The Pennsylvania Steel Company, New York, N. Y.; C. N. Leet, National Brake & Electric Company, Chicago, Ill.; Charles J. Mayer, Electric Service Supplies Company, Philadelphia, Pa.; Daniel W. Smith, Peter Smith Heater Company, Detroit, Mich.; A. L. Wilkinson, The Ohio Brass Company, Mansfield, Ohio.

TWIN CITY COURTESY BULLETIN

Willard J. Hield, general manager Twin City Rapid Company, Minneapolis, has distributed to all employees of the company a reprint of the following bulletin "Concerning Courtesy" originally conceived by the Delaware, Lackawanna & Western Railroad:

"The following expression to all employees indicates the attitude of this company on a subject of vital interest to its patrons:

"The possession in marked degree of any worthy faculty should always be an incentive to develop that faculty. This company considers that its agents, conductors and other representatives possess the faculty of being courteous to the public above the average. To those who cultivate and exercise this faculty, the company extends its congratulations and its thanks; to those who may not have fully appreciated its importance, thoughtful consideration of the following is suggested:

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

"Second—In a highly complex and technical business such as that of the railroad, there are many things that you, with your training and daily experience, understand with perfect familiarity but which the public do not understand; therefore do not assume that the public should comprehend them without asking questions, but when they make inquiry of you give them the courtesy of a reply just as full and clear as you can make it, and without any suggestion of superiority born of a greater knowledge.

"Third—Words are only one means of expression and manner is quite as important; therefore remember that a

kindly and gracious manner is not only the sign and mark of a self-respecting man, but is to your words what oil is to machinery in making them move effectively to their purpose.

"Fourth—True courtesy is no respecter of persons. It remembers that 'a man's a man for a' that,' and gives the civil word and the helping hand quite as readily to the ill-clad stranger as to an official of the company.

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

"It pays in the friends it makes you personally and as a representative of the company.

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

"It pays in raising your standing with the company.

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

"It is the wish of the management of this company that all its representatives, whose work brings them into contact with the public, may appreciate and fully measure up their duty and privilege in this respect."

A LARGE GRAB BUCKET IN CLEVELAND

At the Windermere storage yards of the Municipal Traction Company, in Cleveland, there is in use for handling crushed stone a large grab bucket furnished by the Brown Hoisting Machinery Company, Cleveland, which differs from other grab buckets in not requiring a special two-drum engine to operate it. The bucket is used at the Windermere yards on a boom derrick, being hooked onto the crane's block hook and closed in the stone and lifted when filled by hoisting on the line. A tripping rope leads to the bucket head to open the bucket, and only a slight jerk



Grab Bucket Used at the Windermere Storage Yard

of the line is needed to release the grab. The bucket can be put on the derrick or taken off by hooking or unhooking the bucket rope. The derrick is used to load and unload rails, ties, etc., with the block and hook, and owing to the variety of work it is desirable to be able to change rapidly from the hook to the grab bucket or vice versa. The bucket is of 45 cu. ft. capacity and 600 tons of crushed stone have been loaded into cars in 10 hours, being handled as low as 8/10 cents per ton. The bucket is also used on an ordinary derrick mounted on a flat car when it is desired to handle crushed stone, coal or sand at distant points in the yard not served by the boom derrick.

ELECTRIC RAILWAY LEGAL DECISIONS

LIABILITY FOR NEGLIGENCE

Delaware.—Eminent Domain—Procedure—Survey of Railroad.

Under the provisions of the general corporation law for condemnation of land for a railway, after the survey of its route and location has been deposited in the office of the Secretary of State, there can be no condemnation of any land not shown by such survey to be included in said route and location.—(Cooper v. Delaware General Electric Ry. Co. et al., 68 Atl. Rep.)

Delaware.—Railroads—Grade Crossings—Construction of Road—Costs.

Under Section 116 of the general corporation law a railway company will be permitted to construct its line across a steam railroad at grade, when it appears by satisfactory proof that an overhead or undergrade crossing at the point of intersection is not practicable.

In such case the decree will prescribe the specific method of constructing the crossing necessary to insure safety, and the appliances essential therefor, which, with the attendance required for their operation, will be at the charge and expense of the company making the application.—(New Castle & D. C. Ry. Co. v. Delaware R. Co., 68 Atl. Rep., 386.)

New York.—Carriers—Street Cars—Injury to Passenger—Dangerous Place—Negligence—Proof.

Where plaintiff was injured while riding on the rear bumper of a crowded car, he assumed the risk incident to that position, although his fare was accepted.

Where a passenger on a crowded street car was injured by the trolley pole slipping from the wire, negligence could not be inferred from such occurrence, and no recovery could be had in the absence of some additional proof that the slipping of the pole from the wire was due to some negligent act of the carrier.—(Feldheim v. Brooklyn, Q. C. & S. R. Co., 107 N. Y. Sup., 413.)

New York.—Street Railroads—Injury to Person Near Tracks—Negligence.

Plaintiff, in crossing a street where a street car track made a sharp curve, at the side of which, about two feet from the track, was an unguarded excavation, after crossing the tracks was compelled to pass between the excavation and the tracks. As she, with others, was about to cross, a car approaching the curve was stopped by a policeman to enable them to pass. Plaintiff, who was the last to cross, had passed the front end of the car, when it started, and she was struck by the rear fender as the car rounded the curve and thrown into the excavation. Held, that the motorman was guilty of negligence in starting the car before plaintiff had an opportunity to reach a place of safety.

A person crossing in front of a street car while at a standstill has a right to assume that it will not be started or so operated as to strike her until she has had a reasonable opportunity to pass the point of danger.—(Mittleman vs. New York City Ry. Co., 107 N. Y. Sup., 107.)

New York.—Carriers—Injury to Passenger—Negligence of Conductor—Emergency Action.

Where a female passenger on a street car, after the conductor gave one bell and the car slowed up, got on the running board, ready to alight, but made no other move to alight, and the conductor then seeing her, gave three bells to stop the car, for fear she would step down, whereupon it was stopped with a jerk, throwing her off, the carrier is not absolved from liability for the conductor's negligence, on the ground that he acted when the passenger was in apparent danger, and for her safety, and that, if he made a mistake in judgment, it was not responsible therefor.—(Sheppard v. New York City Ry. Co., 107 N. Y. Sup., 553.)

Massachusetts.—Street Railroads—Collision of Car with Team—Evidence—Opinions—Conclusion from Facts.

Whether the driver of an ice wagon, all but the rear part of which got over the tracks when it was struck by a street car, was negligent, is a question for the jury; the place being near the office, barns and scales of the ice company, and the driver testifying that before he started to cross he looked back a distance of 200 or 300 feet, and saw no car, and the car having neither given any signal nor slackened its speed.

The question put to plaintiff for the purpose of showing that he did not believe there was any peril in crossing the tracks as he did, "At the time you crossed over did you think there was any danger in passing over the tracks as you did?" is competent, though exclusion thereof might not be reversible error, if all the circumstances and the fact that judgment was formed at the time were in evidence, and though the real question is what a reasonably prudent

and cautious man, exercising his faculties for his protection, would have done under all the circumstances.—(Jedrey v. Boston & N. St. Ry. Co., 84 N. E. Rep., 316.)

Massachusetts.—Street Railroads—Injuries to Persons On or Near Tracks—Evidence—Sufficiency—Contributory Negligence.

In an action for injury to a workman who was struck by a street car while at work in the street, evidence that he had worked in that locality for some weeks, and had noticed that it was customary for cars to use their gongs when men were near the track, but that for hours at a time he would not notice whether the cars rang their gongs or not, but that when he did notice the cars rang their gongs when men were near the track, is insufficient to establish a custom to sound a gong, or to show any excuse for a failure to use his own senses for his protection.

A workman, engaged in laying stone on a street between the curb and a line 18 inches beyond street railway tracks, was struck by a car. His work did not bring him between the tracks, or within 18 inches thereof, and the overhang of the car was not beyond that distance. The track was straight and the view obstructed for over 200 feet. He was facing in the opposite direction from that in which the car came, and testified that at the time of the accident he was not thinking at all whether he was so near the track that a car might strike him. No established custom to give notice of the approach of a car appeared. Held, that the workman was not entitled to recover, as having failed to exercise proper care for his own safety.—(Kelly v. Boston Elevated Ry. Co., 83 N. E. Rep., 865.)

Missouri.—Carriers—Carriage of Passengers—Injuries—Contributory Negligence—Dangerous Position—Question for Jury—Assumption of Risk—Question for Jury—Negligence—Contributory Negligence—Speed of Car—Words and Phrases—"Rapidly"—Carriers—Carriage of Passengers—Injuries—Contributory Negligence—Proximate Cause.

Whether it is negligence for a passenger with the knowledge and implied assent of the trainmen to take a position on the car less safe than that of riding in a seat is a question for the jury.

A passenger, by riding on the running board, assumes only the risks incidental to that position, and not those resulting from the failure of the carrier's servants to observe due care in the management of the car.

Evidence, in an action by a passenger to recover for personal injuries, considered, and held sufficient to take the case to the jury on the question of negligence and contributory negligence.

In an action by a passenger on a street car to recover for injuries received by striking a wagon which the car was passing, evidence that the car was running at its usual speed when the danger was discovered, and that no effort was made to reduce the speed until plaintiff was injured, is sufficient to justify submitting to the jury the question whether the gripman ran the car rapidly past the wagon.

The word "rapidly" is to be construed in the light of the circumstances of the particular situation, and a car is running rapidly, if, while running at its usual speed, it attempts to pass a wagon in the middle of a block, so close to the track as to threaten a collision, without reducing speed.

Although a passenger may be negligent in standing on the running board of a car, if the gripman, knowing of his dangerous position, and that there is danger of his striking a wagon which the car is about to pass, takes no precautions for his safety, and he is injured, the proximate cause of the injury is the negligence of the carrier.—(Vessels v. Metropolitan St. Ry. Co., 108 S. W. Rep., 578.)

Texas.—Trial—Instructions—Weight of Evidence—Damages—Personal Injuries—Aggravation of Previous Disease.

In a personal injury case, plaintiff alleged that she was injured on August 31, and she and her witness testified that she was hurt on the forenoon of that day while boarding a combination car on a certain line of defendant's railway. Defendant offered testimony that on that date it operated but one combination car on that line, and the conductor on that car testified that no such accident occurred on that day. Held, that an instruction that if plaintiff was injured as the proximate result of negligence of defendant's employees in charge of the car, so as to render defendant liable, it was immaterial as affecting plaintiff's right to recover whether she was injured on the exact day alleged or not, while perhaps not reversible error, might be criticised as on the weight of the evidence.

A person negligently injured while boarding a street car, though physically unsound before the accident, is entitled to damages for such injury as aggravated her previously diseased condition.—(Houston Electric Co. v. Green, 106 S. W. Rep., 463.)

News of Electric Railways

The Cleveland Situation

John A. Cline, attorney, has requested the attorney-general of Ohio to bring proceedings against the Municipal Traction Company to prevent it from handling the securities of the Cleveland Railway on the ground that the company has no right under its charter to conduct such a business and that the stock is being misrepresented in order to sell it. He says the Municipal Traction Company is advertising that it will guarantee this stock when, as a matter of fact, it is capitalized at only \$10,000 and is not in a position to do as it says it will. Moreover, he says that the franchise of the Cleveland Railway is in peril because of the referendum movement and that the stock would be worth much less if the franchise should be revoked by a vote of the people. Mr. Kline states that he has taken this action for a client and that if the attorney-general does not bring quo warranto proceedings, he will institute proceedings himself.

The use of free transfers has increased at least 10 per cent since July 28. Up to that time the proportion of transfers to the total number of rides was about 23 per cent, but the officials state that the increase has been gradual up to 32.85 per cent on July 30. This would indicate that the company is having more business at a smaller income, which will probably result in a somewhat increased expense, though not large. For the few days in July that free transfers were given the business showed a decrease of from \$3,591 to \$5,078, as compared with the receipts of the Cleveland Electric Railway for the same days a year ago.

The company is making a very careful record of the effect of free transfers to be used in case it is desired to restore the charge for them or rearrange the fare.

Referring to the threats made in the City Council that action would be taken to compel the company to restore all stops recently discontinued, President du Pont states that he knows nothing about the elimination of stops without the consent of the Council, but that if authority is given the company will rearrange the stops. Under the Cleveland Electric Railway stops were made at almost all street intersections. While this makes operation slow, the people seem to prefer it to the present arrangement, which on some lines does away with about half the stops. About the only way to make the service satisfactory is to establish a rapid transit system, such as the Cleveland Electric Railway proposed for those living at a distance from the business district.

The officials of the Municipal Traction Company have been notified from Chicago that the aluminum disks used for tickets in Cleveland are being counterfeited and distributed through the medium of conductors on the local lines.

Attorneys for the Municipal Traction Company are drawing up a \$10,000,000 mortgage for the Cleveland Railway to provide for the bonds that mature within the next three years and possibly to wipe out the floating debt. The bonded debt maturing within that time consists of \$8,026,000, of which \$2,026,000 is due on July 1 of next year; \$1,000,000 due March 1, 1910, and \$5,000,000 due March 1, 1913. The floating debt taken over by the Municipal Traction Company amounts to \$1,288,000. The new mortgage will bear 5½ per cent interest.

A member of the City Council has suggested that the company furnish special cars for workmen, leaving the factory districts between 5 o'clock and 6 o'clock in the afternoon and running through to certain sections of the city, so that transfers would not be necessary.

Program of the International Street Railway Association

The program of the next convention of the Union Internationale de Tramways et de Chemins de Fer d'Interet Local has just been published. The convention will be held Sept. 7 to 10, 1908, at Munich, where there is now a national exposition, and will receive official recognition on the part of the Bavarian Government and the city of Munich. The following program has been adopted:

On Sunday, Sept. 6, at 8:30 p. m., a reception will be given to the delegates and ladies in attendance at the hall of the Chamber of Commerce, at which badges will be distributed.

On Monday, Sept. 7, the convention will be called to order at the old hall in the City Hall. Addresses of welcome will be given by the Minister of Railways of the

Bavarian Government and by the mayor of the city. In the afternoon a trip will be taken on the street railway lines of the city to the exposition. In the evening a banquet will be extended to those present by the Minister of Railways.

On Tuesday, Sept. 8, at 8:30 p. m., there will be another meeting of the association at the City Hall. In the afternoon a trip will be made by cars to the car houses, power stations and other points of technical interest. In the evening there will be a party to the theater in the exposition grounds.

On Wednesday, Sept. 9, the association will convene at the Hotel Wagner at 9 o'clock. After a lunch at noon to be extended to the delegates by the Lokalbahn-Aktien-Gesellschaft, of Munich, there will be an excursion by train to the Starnberg Lake. The day will conclude by a reception in the evening at the exposition.

On Thursday, Sept. 10, at 8:30 a. m., the association will again convene at the City Hall. In the afternoon there will be a trip by train to Pullach, where an opportunity will be afforded to visit the hydro-electric plants of the Isar. In the evening the association will be tendered a banquet by the city of Munich.

On Friday a special excursion will be made to the Bavarian Alps and on Saturday to the exposition, museums and other places of interest in the city of Munich.

New York Subway Completed

The operation of trains on the extension of the subway between 230th and 242d Streets on Aug. 1 marked the completion of the first subway system in New York. The Van Cortlandt extension, as the section just opened is known, was not embodied in the first plans for the subway, but neither was the Brooklyn extension. Both were added after the contract for the more important sections had been let. Each, however, is an integral part of the whole. The underground road was planned by the old Rapid Transit Board which passed out of existence through the act of the Legislature which created it, prior to the finishing of the undertaking. The bid of John B. McDonald was accepted by the Rapid Transit Commission on Jan. 15, 1900. He offered to build the main line from the Brooklyn Bridge to the Ship Canal, for \$35,000,000, with \$2,750,000 for extras in the shape of terminals, station sites and similar accessories to a railroad. Mr. McDonald sublet the contract to 13 sub-contractors. Ground was first broken on March 25, 1900. The contract called for the finishing of the work in four and one-half years. The time actually spent on the construction work on the main line was 1,275 days; the largest number of men employed in one day was 12,000 and the average number 4,661. After more than four years the subway was finally finished as far as Broadway and 145th Street, and on Oct. 27, 1904, it was opened to the public. The road at that time extended over 20.47 miles, including the Lenox Avenue branch, 5 miles of the length being on viaducts and the rest underground. In the meanwhile the contract for an extension to Brooklyn had been let. In this work the contract time was exceeded by more than a year. Finally in January, 1908, the Brooklyn extension was opened to the public. Prior to this time, however, the old Rapid Transit Board had gone out of office and had been succeeded by the Public Service Commission. Before going out of office, however, the old board contracted for the building of the Van Cortlandt extension, just opened, as an "extra" on the original contract for the main line. The subway represents an outlay of about \$60,000,000 for construction work, exclusive of equipment. The distance from end to end is approximately 20 miles, and it is possible to ride the entire distance for a 5-cent fare without a change of cars.

The Work of the Little Rock Railway & Electric Company.—An interesting article on the system of the Little Rock Railway & Electric Company appears in the *Daily Arkansas Democrat* for July 19. It gives a map of the system and states that during the past year the company expended about \$300,000 on the various paving districts. Every foot of track in these districts has been renewed and rebalasted.

The City Council, of St. Louis, has passed the measure creating a public utilities commission consisting of five members, the Council to appoint three and the House of Delegates two members, each to receive a salary of \$2,500 a year and all necessary expenses incurred in the work. The members of the commission are to be appointed within

60 days after the approval of the ordinance by the Mayor, which will make the maximum time before a commission is created about the middle of October. The commission will supervise the conduct of the public service corporations, and as its first work will inquire into the rates of several companies. Reports are to be made by the commission every six months, or at any time either house of the Municipal Assembly shall request the commission to conduct an inquiry.

Pension Plan Outlined in New York.—If the employees of the companies in New York which are now under the charge of Frederick W. Whitridge, as receiver, will cooperate with the management of the companies, Mr. Whitridge and the committee of the bondholders of the roads will establish a provident association similar to the one formed some years ago by the employees of the New York City Railway and to the one which formerly existed among the Third Avenue Railroad employees.

Plans Presented for the Malden Elevated.—George A. Kimball, chief engineer of the Boston Elevated Railway, presented the plans of the proposed extension of the elevated structure to Malden from Sullivan Square, Charlestown, before the Malden Board of Aldermen on July 28. Mr. Kimball stated that the extension is designed to relieve the traffic conditions at Sullivan Square Terminal and to provide better service between Malden and the Boston business district. The running time from Malden to Scollay Square is estimated at 14 min. by the new route. Mr. Kimball explained that the Malden terminal would probably be located on Middlesex Street, near Pleasant Street, with stations at Broadway, Everett, and at Sullivan Square. The area required for the Malden terminal will probably be about twice as large as that at Sullivan Square. The present plan is to use a moving stairway instead of an incline for connecting with the surface cars. Escalators would then be used as planned for the Forest Hills and the Old State House stations.

Advanced Degrees in Electrical Engineering.—The Massachusetts Institute of Technology has decided to emphasize its graduate courses by the grant of master and doctor degrees. The degree of Master of Science will be established for those who spend one year of advanced study of electrical engineering, and that of Doctor of Philosophy or Doctor of Engineering for longer periods spent in advanced study and research. The degrees of Master of Science and Doctor of Engineering are particularly applicable to students following electrical engineering studies. The advanced work leading to the doctor's degree may follow in its major part either the lines outlined by Professor Jackson's lectures on the organization and administration of public service companies or by Professor Clifford's advanced course on alternating currents, as the individual students may choose, and it is expected to be accompanied by such other work as may be chosen by the individual students (subject to faculty approval) from other departments of science and engineering. The advanced courses in electrical engineering at the Massachusetts Institute of Technology are planned particularly with a view to meeting the needs of such students as have hitherto found it necessary to go to foreign countries for advanced engineering instruction.

Illinois Strike Settled.—On July 30 an agreement was reached between the striking trainmen of the Elgin & Belvidere Electric Company and the management of the road. The contract will be in effect for one year. By its terms the union is recognized and the men are given an increase of approximately 2½ cents per hour. Among the clauses in the contract appear the following: "Those men in the employ of the company on July 24 are to be returned to their former positions without discrimination. The company agrees to meet and treat with properly accredited representatives of the amalgamated association upon all questions and differences that may arise in the future. The company agrees to arbitrate all differences that cannot be amicably settled between the parties to this contract. Where employees are suspended or discharged and upon investigation it is found that the employee is not at fault he shall be reinstated and paid for the time lost." The conditions surrounding this labor difficulty were especially unfavorable to the company. The Elgin & Belvidere Electric Railway extends from Elgin to Belvidere, Ill., a distance of 40 miles, and in entering these terminal cities operates under agreement with the Aurora, Elgin & Chicago Electric Railroad at Elgin and the Belvidere City Railway Company at Belvidere. It purchases current from the Aurora, Elgin & Chicago Railway, connecting with the latter company's transmission system at Elgin. During the strike the local authorities in the terminal and intervening cities were in sympathy with the strikers and therefore did not give the company the support which it needed to control the situation.

Financial and Corporate

New York Stock and Money Markets

AUGUST 5, 1908.

The Wall Street stock market has been dull, and trading has been light for the past week, although there was some improvement on Aug. 4, the last day of the week under review. While crop news as a general rule has been excellent, there have been, since the first of August, many rumors of damage to the wheat of the Northwest and high prices in Chicago were the result. High prices of grain mean demoralization of stocks in most cases, but in this instance Wall Street seems to have placed little confidence in the cries of the calamity howlers, and beyond slightly increasing the activity in trading the Chicago flurry had no effect. The truth of the matter is that Wall Street believes the country is on the threshold of an era of great prosperity and that securities will eventually be much higher regardless of the trifling interferences of spotted crop reports and temporary setbacks. The entire situation in the financial world is illogical when money is plentiful and practically goes begging at from 1 to 2 per cent and first-class investment securities returning more than 6 per cent are stagnant and can find no purchasers. During the week the most important happening was the clearing up of the situation of the Gould properties through the financing of the maturing Wheeling & Lake Erie notes. This was accomplished by a tacit agreement between Mr. Morgan and Mr. Harriman which means that there will be no demoralization of trunk line rates. The quarterly report of the United States Steel Corporation was distinctly encouraging. It showed that sufficient surplus had been earned to pay the prevailing rate on the common stock and it also carried with it the announcement that for the first 24 business days of July orders had averaged 26,000 tons per day, more than for any period since last October. The demand for money was light and the call from the west for crop moving purposes was hardly as great as had been anticipated. On Aug. 4 there was a plentiful supply of money to be had at 1 and 1¼ for call and 2½ per cent for 90 days.

Other Markets

There has been little trading in tractions on the Boston market during the past week, although prices have remained firm and in some instances have recorded fractional advances. A few shares of Boston Elevated have changed hands at 132 and now and then an odd lot of Massachusetts Electric has been sold, the common at 10 and preferred at 49.

In Philadelphia there was some trading in tractions, Rapid Transit and Traction being especially active at slightly lower prices. American Railways was also in the market selling at about 44.

In Chicago there was some movement in subway stock at 20½ and in the bonds of the Chicago City Railways at 40½. Some West Side Elevated also changed hands.

The only thing of interest in Baltimore in the traction market was United Railway bonds. Of these the 4s were principally in evidence, some considerable lots changing hands at from 87½ to 87¾. The 5s were also in the market at 54¾. Virginia Electric Railway 5s sold at 95½.

Washington, Baltimore & Annapolis pooling certificates fluctuated the past week, but closed a few points lower than for some time previous. Cleveland Railway commanded from 94 to 94¼, with 95 asked, a better figure than has been received for that security before. Northern Ohio Traction & Light holds firm at 16¼.

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

	July 28.	Aug. 4.
American Railways Company, Philadelphia.....	a44¼	44
Boston Elevated Railway.....	135	132
Brooklyn Rapid Transit Company.....	52	52¾
Chicago City Railway.....	a190	a180
Cleveland Railway.....	a95	95
Consolidated Traction Company of New Jersey.....	a70	69½
Consolidated Traction Company of New Jersey, 5 per cent bonds.....	103½	a193½
Detroit United Railway.....	a40	a40
Interborough-Metropolitan Company.....	11¾	11¼
Interborough-Metropolitan Company (preferred).....	31¼	32¾
Manhattan Railway.....	a139	138¾
Massachusetts Electric Companies (common).....	9	10¼
Massachusetts Electric Companies (preferred).....	46	49
Metropolitan West Side Elevated Railway, Chicago (common).....	a15¼	a17
Metropolitan West Side Elevated Railway, Chicago (preferred).....	a50½	a48½
Metropolitan Street Railway.....	a30	a30
North American Company.....	66	65¾
Philadelphia Company, Pittsburg (common).....	39	38½
Philadelphia Company, Pittsburg (preferred).....	41	41
Philadelphia Rapid Transit Company.....	16	15
Philadelphia Traction Company.....	90	88
Public Service Corporation, 5 per cent collateral notes.....	a96	a96
Public Service Corporation, certificates.....	a70	a70
Twin City Rapid Transit Company, Minneapolis (common).....	a91¼	a91¼
Union Traction Company, Philadelphia.....	50¾	50

a Asked.

Report of the Schuylkill Railway for the Year Ended June 30, 1908

The Schuylkill Railway, Girardville, Pa., reports earnings as follows for the year ended June 30, 1908:

	1908	1907
Gross receipts.....	\$206,479	\$202,262
Operating expenses, including taxes and insurance.....	104,299	105,973
Net earnings.....	\$102,179	\$96,289
Interest charges.....	68,500	68,402
Surplus	\$33,679	\$27,887

This is more than 8 per cent on the capital stock of the company.

Attention is called to the fact that the Schuylkill Railway acquired this property on April 18, 1905. It has spent for betterments, improvements and organization expenses. \$215,269.

A statement of earnings and operating expenses by years since 1904 follows:

Year	Gross receipts	Op. expenses
1904.....	\$154,416	
1905.....	171,978	
1906.....	194,430	\$100,795
1907.....	202,251	106,074
1908.....	206,479	104,299

Report of Michigan United Railways Company

The Michigan United Railways, having absorbed by consolidation the Michigan Traction Company, the Michigan Traction Extension Company, the Jackson & Battle Creek Traction Company, the Lansing City Electric Railway and the Lansing, St. Johns & St. Louis Railway, reports earnings of the system (Jackson Consolidated Traction Company included) for the year ended April 30 as follows:

	1907-08	1906-07
Gross earnings.....	\$944,061	\$877,015
Operating expenses.....	529,277	476,851

*Net earnings..... \$414,784 \$400,164
Income account for year ended April 30, 1908 (Jackson Consolidated Traction Company not included):

Profit for year after paying operating expenses, taxes and interest on divisional bonds.....	\$208,843
Deduct—Interest on bonds secured by mortgage of 1906 now known as "First and refunding bonds".....	\$80,000
Dividend on preferred stock (6 per cent).....	60,000— 140,000
	\$68,843

Surplus from previous year after adding \$273 for adjustments 93,108

Total surplus as per balance sheet..... \$161,951

*The net earnings of the Jackson Consolidated Traction Company are not included in the income account above, the books of this company having been kept separately. The net earnings of the Jackson Consolidated Traction Company, after paying fixed charges, including interest on \$800,000 of 5 per cent first mortgage bonds which are not embraced in the balance sheet below were \$30,000 for 1907-08, and this sum must be included in the net profits, as the Jackson Consolidated Traction Company is the property of the Michigan United Railways Company.

GENERAL BALANCE SHEET, APRIL 30, 1908

Liabilities	
Common stock.....	\$4,000,000
Preferred stock, 6 per cent cum	1,000,000
First mortgage 5 per cent bonds.....	1,900,000
Underlying bonds unexchanged.....	2,400,000
Sundry creditors.....	175,419
Accrued bond interest.....	82,083
Balance surplus to next account.....	161,951
Total	\$9,719,453
Assets	
Franchises and properties.....	\$9,438,386
Cost of new work and betterments.....	106,319
Material and stock on hand.....	50,703
Sundry debtors.....	13,214
Prepaid accounts.....	19,503
Sinking funds.....	45,972
Cash on hand and at call.....	45,356
Total	\$9,719,453

Chicago (Ill.) Railways.—The company has deposited with the Merchants' Loan & Trust Company \$250,000, or the amount of the annual sinking fund for the consolidated bonds, series C. The money is to be used in the purchase and retirement of series C bonds. These bonds will not be purchased in the open market, but will probably be acquired by the payment of certain indebtedness for which series C bonds are held as collateral. The collateral could then be taken up and canceled.

Denver (Col.) City Tramway.—A meeting of the stockholders of the company will be held on Aug. 27 to authorize an issue of \$25,000,000, 5 per cent 30-year mortgage bonds, to be used for the following purposes: To refund the present outstanding indebtedness; to acquire all or any part of the property and assets of the Denver & Northwestern Railway and the Denver Tramway Power Company and to pay off or exchange for the outstanding bonds of these two companies as well as to provide funds for future extensions, additions and improvements to the company's lines

Hudson Companies, New York.—This company transferred title on July 29 to the westerly block front in Broadway between Thirty-second and Thirty-third Streets, New York, to the Manhattan-Hudson Realty Company, a subsidiary concern, which mortgaged the property for \$3,000,000 to the Mutual Life Insurance Company. This is the site on which the Hudson & Manhattan Railroad intends to erect a terminal station for its tunnel between Thirty-third street and Sixth Avenue, New York, and Hoboken, N. J. The company is now operating up Sixth Avenue, New York, as far as Twenty-third Street.

Mohawk Valley Company, New York, N. Y.—The increase in the capital stock of the Rochester & Eastern Rapid Railway and the decrease in that of the Mohawk Valley Company, mention of which was made in the ELECTRIC RAILWAY JOURNAL for Aug. 1, are merely steps in the plan to bring all the properties under the control of one company. The Mohawk Valley Company is a holding company organized outside of the authority of the Public Service Commission and it is the intention to operate the properties under the supervision of the commission. This and the original plan to centralize the properties in one corporation make it necessary to have a new owning company. The increase of the capital stock of the Rochester & Eastern Rapid Railway does not necessarily mean that this will be the owning company. The changes necessary to bring the properties under one head are complicated and the increase and decrease mentioned are merely steps to the end. A new company may be organized to take over the properties when the other corporations are ready to be transferred, and the Mohawk Valley Company, as a holding company, will probably go out of existence finally, as there will be no need for it when the plan is worked out. There are three groups of properties to be brought under the control of the one company. The roads centering at Rochester, Utica and Syracuse are controlled by the Andrews-Vanderbilt syndicate, and it has valuable holdings at Schenectady. To bring these together, under the new plan, will require a large amount of detailed work, in which the moves that have been made at Rochester are only the beginning. The changes have nothing to do with construction or extensions and no work of that kind has been planned in connection with them. When the changes are completed the lighting interests at Rochester will be divorced from the railway business and will be operated by a separate corporation. It seems that the plans of the syndicate include only the operation of electric lines, but in order to secure the properties at Rochester the lighting business had to be taken over also. There appears to be nothing in the changes in the capital stock of the companies mentioned which is at variance with the plans formulated originally.

Virginia Passenger & Power Company, Richmond, Va.—Reorganization of the Virginia Passenger & Power Company, the Richmond Passenger & Power Company, the Richmond Traction Company, and controlled lines, has been undertaken by a committee consisting of Douglas Robinson, chairman; Frank J. Gould, Charles S. Whelen and others. The Bowling Green Trust Company is depository. In the plan of reorganization of the company the committee has obtained reports upon the properties from Ford, Bacon & Davis and J. G. White & Company, New York, summaries of which are printed with the plan and agreement for the information of security holders. As noted in the ELECTRIC RAILWAY JOURNAL for Aug. 1, Sept. 24 has been set by the court as the day for signing the order directing the sale of the property to satisfy creditors. Sept. 3 has been set by the reorganization committee as the last day for the deposit of securities.

Traffic and Transportation

Segregation of New York City Lines

Formal notice was given on July 30 by the receivers of the Metropolitan Street Railway that the service on the Fifty-ninth Street Crosstown and the East and West Side Belt lines would not be interrupted, although on Aug. 6 the receivers, in accordance with the order of Judge Lacombe, of the United States Circuit Court, would relinquish the operation of the lines to the lessor, the Central Park, North & East River Railroad. A temporary arrangement has been entered into by which the Metropolitan Street Railway supplies at cost all the rolling stock and power needed to provide an adequate service for the public.

The change results in the abolition of transfers between the Metropolitan Street Railway and the other lines at all points of intersection except at Thirty-fourth Street and Tenth Avenue, and at Forty-second Street and Tenth Avenue, where, owing to joint ownership of tracks, the court instructed the receivers to issue transfers.

On Aug. 6 the Broadway-Columbus Avenue cars of the Metropolitan Street Railway began running through Fifty-third Street, between Seventh and Ninth Avenues, instead of through Fifty-ninth Street; the Sixth and Amsterdam Avenue cars of this company also pass through Fifty-third Street from Sixth to Ninth Avenue, instead of through Fifty-ninth Street; no more cars of the Sixth Avenue line are operated through Fifty-ninth Street to First Avenue, though cars are operated in First Avenue between 125th Street and Fifty-ninth Street. The Christopher Street ferry cars run to East Fourteenth Street and Avenue A instead of to the East Twenty-third Street ferry, as at present, and the operation of the Avenue C cars has been modified. Westbound they turn south at Houston Street and thence to the Desbrosses Street ferry by Washington and Watts Streets. In going east these cars run through Watts, Greenwich and Charlton Streets and thence over the route formerly used.

Oren Root, general manager of the Metropolitan Street Railway, caused the following notice to be posted in the cars of the Metropolitan Street Railway and Central Park, North & East River Railroad:

"In accordance with the order of the United States Circuit Court for the Southern District of New York, the receivers of the Metropolitan Street Railway on Aug. 6, 1908, will discontinue the operation of the lines of the Central Park, North & East River Railroad, which include the Fifty-ninth Street crosstown electric line, the west belt horse-car line, traversing Tenth Avenue, West Street and other thoroughfares between Fifty-fourth Street and South Ferry; also the east belt horse-car line, which runs through First Avenue, Fourteenth Street, South Street and other streets between Fifty-ninth Street and South Ferry.

"Effective Thursday, Aug. 6, 1908, by order of the court, the issuing of transfers to the lines above stated by conductors of the lines of the receivers of the Metropolitan Street Railway will be discontinued, excepting at the following points:

"Thirty-fourth Street and Tenth Avenue; conductors of westbound Thirty-fourth Street crosstown cars and the West Thirty-fourth Street pier cars, eastbound, will issue transfers to northbound or southbound west belt cars.

"Forty-second Street and Tenth Avenue; conductors of eastbound Thirty-fourth Street crosstown cars will issue transfers to northbound or southbound west belt cars."

At a meeting of the directors of the Central Park, North & East River Railroad Company on July 29, George W. Linch, who until the appointment of the receivers for the New York City Railway, was president of the Dry Dock, East Broadway & Battery Railroad Company, was selected as general manager.

Collecting Excess Fares on Interurban Road.—On July 1 the Western Ohio Railway, Lima, Ohio, began collecting 10 cents excess on all cash fares paid on cars by passengers boarding cars at stations where ticket offices are maintained. No refund is allowed. Collection of each fare excess is permitted under a law passed at the last session of the Ohio Legislature which went into effect on the above date.

Peculiar Accident in Ohio.—While the crew was in the office awaiting orders a car on the Ohio Central division of the Cleveland, Southwestern & Columbus Railway ran down a hill one-half of a mile in length at Mansfield, Ohio, a few days ago, left the track near the bottom and wrecked the front of a house. There were no passengers on the car. A defective brake is said to have been responsible for the accident.

City of Chicago Opposes Elevated Platform Privileges.—In an opinion written by the assistant corporation counsel

of the City of Chicago it is held that the Metropolitan West Side Elevated Railroad has no right under its charter to lease space on its platforms for vending machines, news and fruit stands or like concession. The opinion refers to those stations built over public streets and alleys and therefore includes nearly all of this company's stations.

Freight Service Over Lehigh Valley Lines.—The Mayor of Allentown has signed the ordinance granting the Lehigh Valley Transit Company permission to establish an express service in Allentown. The freight house in Allentown is to be located at the old power house. A special effort will be made to establish service to Philadelphia, as well as all other points along the system. It is said that the Philadelphia Milk Exchange will ask the company to put on refrigerator cars to carry milk.

Booking Excursion Business.—The Toledo & Chicago Interurban Railway has already booked considerable excursion business for August. On Aug. 16 it will carry large delegations to a picnic at Centlivre Park, Fort Wayne. On Aug. 20 an excursion will be conducted to Robinson Park, Fort Wayne. On Aug. 21, the date of the Republican congressional convention at Auburn, the road will transport, among the other delegations, two cars of adherents. On Aug. 22, the Modern Woodmen convene at Auburn, and arrangements are being made by the company for transporting 200 visitors.

Ohio Commission Orders Road to Continue.—The Ohio Railroad Commission has refused to modify its order that the Dayton & Xenia Traction Company operate a line between Dayton and Xenia which it wished to abandon. This order was obeyed until the company went into the hands of a receiver. An injunction was asked in the United States Court to restrain the commission from enforcing the order, but action was delayed until application for a modification of the order could be made. On the refusal of the commission to make any change the Attorney General was instructed to notify the United States Court.

Through Service Between Albany and Saratoga.—The Schenectady Railway began operating on July 27 a new through line between Albany and Saratoga daily known as the Capital Limited. It makes the distance in 1 hr. 45 min., 25 min. quicker than formerly. Cars stop at Schenectady, Ballston Lake, Forest and Ballston Spa. An hourly headway is maintained in both directions, cars leaving either end of the line at 8 a. m. The northbound car leaves the waiting room, Schenectady, at 49 min. after the hour, the southbound car on the even hour. The last cars leave Albany and Saratoga at 7 p. m. The round-trip fare from Albany to Saratoga is \$1.10, the same as at present, or 70 cents from Schenectady.

The Coney Island Fare Case.—In accordance with the statement made by Wm. N. Dykman, counsel for the Coney Island & Brooklyn Railroad Company, before the Public Service Commission of the First District of New York on July 24, the company filed notice with the commission on July 30 that on and after Aug. 31 it would charge 10 cents instead of 5 cents for a ride to Coney Island. The commission will soon begin a hearing into the reasonableness of this increase, and when the change in fare has been made it will issue an order either restoring the old rate or substituting a rate between 5 cents and 10 cents. The company, as stated in the *ELECTRIC RAILWAY JOURNAL* for Aug. 1, originally proposed to abolish the 5-cent fare on July 27, but at the suggestion of the commission filed the regular 30-day notice of the change in accordance with the provisions of the law under which the commission was created.

Direct Fort Wayne-Indianapolis Service.—Under an arrangement completed with the Indiana Union Traction Company for connections at Bluffton for Indianapolis, the Fort Wayne & Wabash Valley Traction Company has 10 trains daily by which passengers may go direct to Indianapolis or make close connections with Indianapolis cars at Bluffton or Peru. The four through trains continue to operate to Indianapolis by way of Peru. Passengers on all cars that make close connections notify the conductor that they are bound for Indianapolis and the conductor in turn notifies the Indiana Union Traction Company's dispatcher, who holds the Indianapolis car. The Indiana Union Traction Company observes a similar system in carrying passengers to Fort Wayne from Indianapolis. No through cars are run from Fort Wayne to Indianapolis by way of Bluffton, however, the new arrangement being one purely of connections.

Virginia Corporation Commission in Favor of Fare Increase.—At the conclusion of the hearing before the Corporation Commission on July 28 upon the application of the Newport News & Old Point Railway & Electric Company and the Hampton Roads Traction Company for permission to increase the passenger rate between Newport News and Hampton from 5 cents to 10 cents, the commission,

through its chairman, states that the companies had made out a prima facie case entitling them to the commission's consent to increase the rate, and that unless the objectors could adduce evidence overcoming that submitted by the companies and showing that the latter are at the present 5-cent rate receiving a fair return on a fair valuation of their properties the request for leave to increase the rate would be granted. The commission fixed Aug. 18 as the time for hearing such evidence as the objectors to the petition may desire to offer. The commission indicated that the present 5-cent fare between Newport News and Hampton is cheap, as compared with other lines in the State, those between Norfolk and Ocean View and between Salem and Roanoke, where the charges are respectively 10 cents and 15 cents for similar distances, being cited.

Hearing on Boston Elevated Railway Changes.—G. A. Kimball, chief engineer of the Boston Elevated Railway, discussed the company's proposed alterations of the elevated stations at a hearing before the Massachusetts Railroad Commission on Aug. 3. At the present North Station the company desires to extend the existing platform southward to allow the operation of eight-car trains in connection with the Washington Street Tunnel; to extend the present middle siding in Causeway Street to the westward for use in a shuttle service between the North and South Union stations, and to build a platform to allow transfers between the through tracks of the elevated division and the shuttle trains. Following the completion of the Washington Street Tunnel the present circuit service around Atlantic Avenue will probably be somewhat diminished. The company's tentative plans for a double station at the North Union station have been altered, and the present plan provides for the transfer of passengers between the existing elevated trains and the new East Cambridge elevated service at Haymarket Square station. The company also desires to lengthen the Dover Street and Rowe's Wharf platforms and to build a new middle siding in Commercial Street opposite North End Park. The capacity of this will be two eight-car trains.

Through Service Between Philadelphia and the Delaware Water Gap.—The Lehigh Valley Transit Company, Allentown, Pa., is operating a through service hourly between Chestnut Hill, Philadelphia, Allentown, Bethlehem, Nazareth, Bangor and Portland and the Delaware Water Gap. The trip from Philadelphia to Nazareth is over the Lehigh Valley Transit Company's lines; from Nazareth to Bangor over the Slate Belt Railroad, and from Bangor to Portland over the Bangor & Portland Railway. The track is continuous, and as cars on connecting roads wait there is no delay. Two through cars are run every day in each direction, accompanied by a lecturer, who explains all the historic points with a megaphone in the same manner as is done on sightseeing automobiles. From Portland to the Delaware Water Gap it is only 5 miles over the Delaware, Lackawanna & Western Railroad, and the fare is only 10 cents. The distance by electric railway is 95 miles, making the total distance from Philadelphia to the Water Gap 100 miles. The Philadelphia ticket office and information bureau is at the department store of Strawbridge & Clothier, at Eighth and Market Streets, where the cars start. Ticket offices and waiting rooms have also been established along the route and tickets are sold from and to all points. There is no increase of fare on the through cars and the service is not a parlor car one.

Increase in Fares on New York Lines.—Leslie Sutherland, receiver of the Yonkers City Railway, posted notice, in the cars on July 31 and informed the employees of his company that beginning Aug. 1 there would be no 8-cent fares to New York. In the past the South Broadway line has been issuing transfers to the Broadway line of the subway for 3 cents in accord with the provisions of the franchise. During Mr. Sutherland's receivership he has been buying the tickets for 5 cents each from the Interborough and reselling them at 3 cents to the passengers demanding them. He says this has cost the Yonkers City Railway about \$15,000 during the receivership, and he cannot longer continue it. This step makes the ride to New York down the west side of the city 10 cents, just as it has been for the last few weeks on the east side. It will be increased on Sept. 1 to 15 cents on both sides, as Receiver Whitridge of the Third Avenue Railroad and the Union Railway has informed Mr. Sutherland that after that date the Union Railway will collect 5 cents for each passenger carried by the Yonkers City Railway's cars in the Bronx. This will make the fare 5 cents in Yonkers, 5 cents for the 2-mile stretch from the city line to Van Cortlandt Park and 5 cents on the Interborough Rapid Transit Company's lines to the City Hall and Brooklyn. On the East Side in New York it will mean 5 cents in Yonkers on the McLean Avenue line, 5 cents down Webster Avenue to Bedford Park or 128th Street, and 5 cents more on the Interborough Rapid Transit Company's lines below Harlem.

Personal Mention

Mr. P. Lindemann has resigned from the New York City Railway to become master mechanic of the Rochester, Syracuse & Eastern Railroad, Rochester, N. Y.

Mr. Henry A. Everett, who has been president of the Toledo Railway & Light Company since it was taken over by the Everett-Moore interests some years ago, has resigned from the company because of ill health. Since the Everett-Moore interests took over the property the lighting interests have been acquired, as well as the Toledo & Western Railway, the local lines in Adrian, Mich., with which the Toledo & Western Railway connects, and the Toledo, Ottawa Beach & Northern, which is in operation between Toledo and Toledo Beach.

Mr. Robert A. Hadfield, chairman of Hadfield's Steel Foundry Company, Ltd., Sheffield, Eng., had conferred on him the honor of knighthood upon the last occasion of the King's birthday. Sir R. A. Hadfield, although still in the forties, has been before the world of steel for many years, and has received many honors from the engineering societies. He received the Bessemer gold medal some years ago, has been master cutler at Sheffield and president of the Iron & Steel Institute. He is best known, however, by his thorough researches into the qualities of manganese steel, and tramway engineers will remember him for his special adaptation of this material for special track work. His knighthood, therefore, is a matter of congratulation from all interested in electric traction.

Mr. J. H. White has been appointed general manager of the Helena (Mont.) Light & Railway Company to succeed Mr. C. E. A. Carr, who resigned from the company to become managing director of the Quebec Gas Company, Quebec, Que. Before accepting his appointment to the Helena Light & Railway Company Mr. White was manager of the Winona (Minn.) Railway & Light Company for two and one-half years, and before that was superintendent of the Alton, Granite & St. Louis Traction Company for about two years during the construction of the interurban railway between Alton and St. Louis. Mr. White was also connected with the Mobile (Ala.) Light & Railway Company for two and one-half years as superintendent of the lighting department. Previous to his connection with the last company he was engaged in railway and transmission construction for five years.

Mr. F. P. Maize, who recently resigned as master mechanic of the Rochester (N. Y.) Railway, has not fully decided upon his plans for the future. Mr. Maize has patented a number of railway appliances, and for the present at least will devote his attention to furthering the interests of an oil cup invented by him which has recently been placed on the market. Mr. Maize began his railway career in the shops of the Carlisle Manufacturing Company, locomotive builders, with which he was connected from 1885 to 1893. In the latter year he became foreman of the machine shop of the Atlantic Avenue Railroad, Brooklyn, and in 1894 accepted a similar position with the Scranton Traction Company. Availing himself of the opportunity afforded by the International Correspondence School of Scranton, Mr. Maize while in Scranton took the course in mechanical and electrical engineering. In 1896 he accepted the position of foreman of repair shops of the second division of the Union Traction Company, Philadelphia. Two years later he became master mechanic of the New York & Queens County Railway, and in 1900 was made superintendent of power houses and equipment. In 1903 he was appointed master mechanic of the Rochester Railway.

OBITUARY

A. W. Barron, a division superintendent for the United Railroads, San Francisco, is dead. Mr. Barron had been connected with the company many years and was very well known in his home city. He died at Monrovia.

Thomas J. Gargan, a member of the Boston Transit Commission, died on July 31 in Berlin, Germany, of hypostatic pneumonia, following an operation for stomach trouble. Mr. Gargan was a native of Boston and was about 64 years old. He was graduated from the Boston University Law School in 1875. For many years he was active in public affairs, having served in both branches of the Legislature, and having been chairman of the Boston License Commission and a member of the Police Board. When the plan of the first Boston subway was decided upon he was placed in charge of the work. He was a member of the University and Papyrus Clubs, of Boston, and the Catholic and Champlain Clubs, of New York. He was the founder of and a director of the United States Trust Company, of Boston.

Construction News

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

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

FRANCHISES

Calgary, Alb.—R. T. D. Aikins, of the Montreal Engineering Company, Ltd., says that the company will consider no franchise for a period of less than 25 years. The matter will be settled at the next committee meeting.

Quincy, Cal.—A franchise has been granted by the Board of Supervisors for the Quincy & Eastern Railroad to A. W. Rutledge, of Oakland. The line is projected to be built through American Valley from Quincy to the Western Pacific Railroad, and is to be completed on or before Jan. 1, 1909. It is to be a standard gage road, with either steam or electricity as motive power.

Los Angeles, Cal.—The bid of Arthur St. Clair Perry of \$100 for the franchise for the Avenue Forty-three cable incline railway has been accepted by the City Council. Mr. Perry was the only bidder. The franchise is for 21 years. The road is to be operated by electricity or other power. The new line will open up a large tract of new territory west of the city controlled by Robert Marsh & Company.

Alameda, Cal.—The City Council on July 20 passed resolutions granting the Southern Pacific Railroad permission to change its motive power from steam to electricity on two of the lines now in operation in Alameda. The Council also ordered advertised for sale the third application for a franchise covering the three proposed extensions, which will unite all the Alameda local lines into a loop with a cross line on Eighth Street, leading into Oakland.

***Pensacola, Fla.**—Louis Boley, of Pensacola, has applied to the Council for a franchise for an electric railway. He proposes to build from Wright and Hayne Streets north through the city and out to Olive, a small town about 10 miles from the city. He says that if the city passes the ordinance he will commence work on the proposed line within 12 months and have it completed and cars running within 18 months.

Harrisburg, Pa.—The Mt. Holly & Gettysburg Electric Railway has asked the Gettysburg Town Council for a franchise. Work on this line, which is to connect Harrisburg and Gettysburg via Carlisle, Mt. Holly, Bendersville and Arendtsville, is to begin in September. The Council has appointed a committee of five to confer with the trolley company.

York, Pa.—An ordinance giving the York Railways the privilege to double-track East Market Street from Duke Street to the city limits was passed by the City Council July 31.

RECENT INCORPORATIONS

Lake Charles (La.) Railway & Light Company.—This company has been incorporated at Lake Charles, La., and will take over the franchises and property of the Lake Charles Street Railway. The company is also authorized to build and operate street railways and interurban railroads anywhere in Louisiana. It also has the right to conduct lighting business, sewerage plants, oil plants, telephone or telegraph plants. Gas lighting and sewers may be provided for Lake Charles, and the business of the existing company may be extended. Capital stock, \$750,000, of which \$250,000 will be preferred. Directors: Thompson J. Bird, president; J. Alfred Landry, first vice-president; D. J. Landry, second vice-president; A. P. Pujó, third vice-president, and Paul O. Moss, treasurer.

***Coos Bay Railway & Terminal Company, Portland, Ore.**—Articles of incorporation have been filed at Portland for the Coos Bay Railway & Terminal Company, organized under the laws of Washington. The officers are: Henry Hewitt, Jr., president; L. J. Simpson, of North Bend, Ore., vice-president; Seymour Bell, of Marshfield, secretary and manager. The company is a closed corporation organized for 50 years with a capital of \$250,000. It proposes to build an electric railway around Coos Bay and down the coast south of Sunset Bay.

***Roanoke (Va.) Traction Company.**—This company has secured a charter from the Corporation Commission with a maximum capital stock of \$2,000,000 to build an electric railway from Roanoke to Clifton Forge via Lynchburg. Incorporators: James P. Woods, president; R. C. Jackson, vice-president; James C. Martin, secretary and treasurer—all of Roanoke.

***Narrows Terminal Belt Company, Tacoma, Wash.**—This company has been incorporated with capital stock of \$250,000

by L. F. Cook, H. L. Gray, C. E. Cutter, C. A. Tonne-son and F. G. Cook to convert Center Street, between the Narrows and Jefferson Street, and D Street, between Jefferson and St. Helens Avenues, into an 80-ft. "Broadway," carrying a double-track street-car line to be built by the Pacific Traction Company or the Tacoma Railway, Light & Power Company. The company will also build docks and warehouses on the Narrows somewhere.

TRACK AND ROADWAY

Strathcona (Alta.) Radial Tramway Company.—A business meeting of the Strathcona Radial Tramway Company was held recently to discuss plans for commencing work in connection with the line. The charter required that operations be started before Aug. 1. It was decided to commence work before that date on the grading down the bridge.

Aurora, DeKalb & Rockford Railroad, Aurora, Ill.—As a result of a meeting of the bondholders of the Aurora, DeKalb & Rockford Railroad with President Dolph, of the Aurora Railways, it is more than likely that terms will be arranged whereby Mr. Dolph will secure control of the road, which is advertised for sale, and that work will be commenced at once to make it an electric railway.

Indianapolis, New Castle & Toledo Electric Railway, New Castle, Ind.—The court has ordered the Union Trust Company, Indianapolis, trustee, to advertise for bids for the completion of the Indianapolis, New Castle & Toledo Electric Railway and bids will be received until Aug. 20. Six miles of grading remains to be done. Several bridges are to be constructed, the roadbed completed and the electric equipment installed. The work is to be paid for by receiver's certificates to be taken at par bearing 6 per cent interest.

Louisville & Eastern Railway, Louisville, Ky.—The extension of this road to Shelbyville has been financed. The distance is 30 miles. Percy Moore is general manager.

Lawrence, Kan.—The plan to build an electric railway from Lawrence to Ottawa is being actively pushed, and a company composed of local and Ottawa interests will probably be organized soon. Ex-Congressman Bowersock and W. R. Stubbs, of Lawrence, are interested in the proposal.

Twin City General Electric Company, Ironwood, Mich.—It is announced that an important extension is projected by this company, which now operates a line between Ironwood, Mich., and Hurley, on the Wisconsin side of the Montreal River. It is proposed to build from Ironwood to Bessemer. Negotiations for right of way are in progress. E. D. Nelson, Ironwood, manager.

Kansas City, Ozark & Southern Railway, Mansfield, Mo.—The Kansas City, Ozark & Southern Railway is rushing work on its new line in Douglas County, and it is expected that cars will be operating over the road this fall.

Champlain & Sanford Railroad, Champlain, N. Y.—This company, through its president, J. Mac N. Thompson, has advised the commission that the order of the Public Service Commission of the Second District of New York granting a certificate of convenience and necessity, if made, shall contain a provision requiring the electrical operation of the proposed road.

Long Island Railroad, Brooklyn, N. Y.—The Public Service Commission has been asked to approve a franchise which the Long Island Railroad maintains gives it the right to lay surface tracks on Atlantic Avenue, between Flatbush and Shepard Avenues. The claim is based on purchase of the rights of the old Brooklyn and Jamaica Railroad Company.

Rochester, Corning & Elmira Traction Company, Rochester, N. Y.—The Public Service Commission of the Second District has issued a supplemental order permitting the Rochester, Corning & Elmira Traction Company to issue capital stock to the amount of \$380,000 par value and \$1,000,000 in bonds, par value. It is provided that the proceeds of the stock or bonds be used exclusively for the construction and equipment of that part of the proposed road from Rochester to Conesus Lake. The original application of the company was for the issuance of \$8,000,000 in bonds and of the balance of its stock of \$3,880,000.

Findlay-Marion Railway, Findlay, Ohio.—G. W. Meeker, Columbus, Ohio; Senator Hankey, Detroit, and Eastern capitalists are said to have agreed to furnish \$750,000 for the construction of the railway and as soon as another \$250,000 is arranged for the construction work will be begun.

Dunnville, Ont.—The project for the construction of an electric railway from this point across the Niagara Peninsula has been revived. The line now proposed would run from here by way of Wellandport and St. Ann's to Beams-

ville and connect with the Hamilton, Grimsby & Beamsville Electric Railway. In connection with their proposals a party of surveyors began work on last Monday to lay out the line. James A. Ross, Wellandport, is president of the company.

Beaver, Pa.—A new street railway from Beaver to New Castle is planned by the New Castle & Beaver Falls Electric Street Railways. Charles Strohecker, of Zelienople, is president. It is proposed to go from Beaver by way of Wampum, West Pittsburg, Newport and Mahoningtown.

Pittsburg, Harmony, Butler & New Castle Traction Company, Pittsburg, Pa.—This company is said to be arranging for the construction of a through line from New Castle and Butler to Lake Erie, at Erie. It proposes, according to report, to purchase the Sharpville Railroad, from New Wilmington to Sharpville and to construct portions to Conneaut Lake where it will connect with the Cambridge Springs and Erie line.

Mt. Pleasant, Tex.—H. W. Peterman says the proposed street railway for Mount Pleasant will be about 4 miles long and run on the principal streets of the city, and to the Red Springs Lake and Delwood Park, about a mile from the city. Six or eight gasoline motor cars will be operated. A name for the company has not been decided upon. Construction is expected to begin within one month. The company will be capitalized for about \$40,000.

***Yakima Valley Transportation Company, Spokane, Wash.**—Seventy miles of electric railway, costing \$2,000,000, will be built by the Yakima Valley Transportation Company, headed by J. Splawn, North Yakima. G. S. Rankin, president of the Yakima Trust Company, is vice-president, Murray B. Miles is secretary and E. M. Kenley is chief engineer and superintendent. Others in the company are Alexander Miller, J. O. Cull, Dr. C. G. Fletcher, A. E. Larson and W. P. Sawyer. The company now has 3 miles in operation. Preliminary surveys have been made and right-of-ways have been secured. The first extension will be to the Washington State fair grounds, southeast of North Yakima. Thence the road is to continue to Yakima City, then across the Yakima River and through Union gap toward Parker and Zillah. Eventually it will be extended to Granger and Sunnyside. Another line is to be extended about 12 miles through the Moxee Valley. The line in operation is to be extended 6 miles to Ahtanum and another line is projected over the north side of the Nob Hill district.

Spokane & Inland Empire System, Spokane, Wash.—Jay P. Graves, president, announced at a recent meeting of the City Council of Spokane that his company has plans under consideration for the building of an electric railway to the Big Bend wheat country west of Spokane. The building of a line from Miles to Kettle Falls, Wash., is also planned. The line from Spokane to Miles will be about 70 miles in length and thence to Kettle Falls is between 52 and 60 miles. The company also has a project to extend from the eastern city limits of Spokane to the irrigated tracts at Opportunity and Vera in the valley, the line running a mile south of the present Cœur d'Alene road. Mr. Graves states that surveyors will be put out at once and that the field line will be run within 60 days. The route has not yet been decided upon, it being uncertain whether the river or plateau will be followed, and it is not determined where the line will touch the Columbia River.

SHOPS AND BUILDINGS

Connecticut Company, New Haven, Conn.—C. W. Blakeslee & Son, New Haven, have been awarded the contract by the Connecticut Company for the construction of the proposed new car barn at Bridgeport. The contract provides for the completion of the buildings so that they will be ready for occupancy on Jan. 1, 1909. There will be two fireproof structures of reinforced concrete. One building will occupy all of the land south of Congress Street, east of Housatonic Avenue, north of the Gold Street approach to the depot and west of the harbor. It will be a one-story building with a second story on the Congress Street front. The ground floor will be utilized for the car shops, while the second floor will be devoted to offices and quarters for the conductors and motormen, including club rooms, lockers, etc. The second building will be erected east of the depot and will be used chiefly for storage purposes. Tracks will be constructed to it from Stratford Avenue and there will also be track connections from Congress Street.

Chicago & Milwaukee Electric Railway, Chicago, Ill.—Plans have been filed with the building department at Milwaukee by the Chicago & Milwaukee Electric Railway for a car barn and substation at Grove and Bottom Streets. The building will be made 60 ft. x 280 ft. and one story high. It will cost about \$50,000.

Manufactures & Supplies

ROLLING STOCK

Third Avenue Railroad, New York, N. Y., has closed a contract with the J. G. Brill Company for 150 pay-as-you-enter cars with 28-ft. bodies similar to those in operation on the Fourth Avenue line of the New York City Railway, and 300 trucks. The new cars will be lighter than the New York City Railway's cars, but will be of same capacity. It is expected that they will also be furnished with a fare box and that all will be in service before Jan. 1, 1909. It is the receiver's intention to put at least 100 in service in November on the Third Avenue Railroad proper. These additional cars will make it possible to equip the Union Railway with 100 standard double truck cars, all of which will be in complete repair.

Illinois Traction Company, Champaign, Ill., has placed a contract with the J. G. Brill Company for 8 passenger cars and 2 sleepers. The passenger cars will have 1 compartment with 7 double windows on each side. They will be of the Pullman style with toilet room. The finish will be mahogany throughout. The sleeping cars are to consist of 10 sections, 5 on each side. From center to center each section is to be 6 ft. 6 in. with upper and lower berths; upper to be same width as lower, but so constructed that the upper forms a portion of the seats and so arranged that it will not be exposed in daytime. That is, there is to be no upper berth of the Pullman pattern. There will be two toilets. The windows will have a double sash. The curtains will be of silk pantasote. The cars will be 52 ft. 6 in. over buffers, 8 ft. 10 in. wide at sills and 8 ft. 6 in. high from floor to ceiling.

Southwestern Traction Company, London, Can., has just received from the Preston Car & Coach Company, Preston, Ont., six new cars, the first order turned out from that factory. The cars are practically a duplicate of the company's former equipment, details of which follow:

Type of car,	Width inside....	7 ft. 8½ in.
Interurban double end	Over all	8 ft. 10 in.
Seating capacity.....	Height inside, sill to	trolley base, 9 ft. 4 in.
Weight	Body, wood or metal..	Wood
Wheel base.....	Underframe, wood or metal,	Wood and steel plate
Length of body.....	Over vestibule..	48 ft. 4 in.
Length over all....		49 ft. 4 in.

Special Equipment

Air brakes,	Hand brakes	Peacock
Westinghouse, S. M. E.	Heating system,	Peter Smith, hot water
Axles	Bolsters, body,	Headlights
5 in.	Steel truss "Diamond"	Interior finish.....
	Car trimmings.....	Bronze
Control system,	Westinghouse, 202	Paint
Couplers....	Radial drawbars	Seats.....
Curtain material...Pantasote	Destination signs,	Trucks, type and make,
Enamel—white on blue	Vestibule,	Brill, 27 E1
Fenders	Pilots	5-ft. doors on both sides

TRADE NOTES

Dossert & Company, New York, N. Y., say that F. A. Lawson & Company, San Francisco, report increasing popularity of Dossert solderless connectors on the Coast. Orders for these devices have been received from the Vallejo, Benecia & Napa Railway, Portland Railway, Light & Power Company, Noble Electric Steel Company and the San Diego Electric Railway.

Union Railway Supply Company, Philadelphia, Pa., has recently purchased from the city of New York the entire car equipment formerly operated on the third-rail system of the Brooklyn Bridge. These cars are not now necessary as the service is being supplied by the Brooklyn Rapid Transit Company. There are 90 cars in the lot. Twenty of them are electric cars, weighing 36 tons each, and 70 are passenger coaches or trailers. All these cars were moved from Brooklyn to Staten Island by track float, and upon their arrival were lifted on to the wharf by a Merritt & Chapman derrick lighter.

General Electric Company, Schenectady, N. Y., says the increasing use of small Curtis steam turbines is strikingly shown by an inspection of a partial list of turbines under 500-kw capacity which up to the present time have been installed by the General Electric Company or are under construction. Of the 570 odd turbines listed, representing a total capacity of about 37,500 kw, 7 per cent are for the export trade. The remainder are intended for domestic

service in central stations, marine work, laboratories of educational institutions, power and lighting plants for hotels and office buildings, laundries, mines, printing establishments and in every branch of manufacturing. It is interesting to note the widely different industries in which small Curtis steam turbines are used. Among the list are wood-working plants, foundries, iron and steel mills, distilleries, chemical plants, ice plants, textile mills, breweries, tanneries, flour mills, shoe factories, paper mills, machine shops, textile mills and ammunition manufacturing plants. Turbines for train lighting are finding a ready market. The latest application of moderate size Curtis turbines is for driving fire pumps. On board ship where a compact generating unit is required small turbine lighting sets are also rapidly coming into favor.

ADVERTISING LITERATURE

MacGovern, Archer & Company, New York.—This firm has issued its August list of apparatus, including electrical and steam machinery, offered for immediate shipment.

Allis-Chalmers Company, Milwaukee, Wis.—The desk calendar of this company for August contains as its subject an Allis-Chalmers steam turbine. On the back of the card is a complete list of the company's branch offices and a list of its products. It has also issued a small bulletin, No. 4014, setting forth the advantages of perforated metal and giving instructions for ordering it.

Weber Gas Engine Company, Kansas City, Mo.—Brochure No. 60, issued by this company, has for its subject the Weber "Down-draft" suction gas producer which it describes, giving the results of tests on a large number of diversified kinds of bituminous fuel. The company will be glad to send a copy of the brochure and its illustrated catalog No. 22, which fully describes the Weber gas engine and "Up-draft" suction gas producer for non-bituminous fuels, on request.

Cutter Company, Philadelphia, Pa.—This company is calling attention in a circular to the fact that it has deposited with the *Electrical World*, New York, \$1,200 in cash, to be distributed by the company, through that publication, to the writers of the best 25 essays on the use of circuit breakers. The competition is open to every user of electricity who is acquainted with the I-T-E circuit breaker and its wide field of usefulness. The conditions of the competition will be mailed on receipt of request, addressed "Essay Competition," The Cutter Company, Philadelphia.

C. W. Leavitt & Company, New York, N. Y.—This firm has reprinted from the *Brass World* of July, 1908, as a folder for general circulation the article entitled "The Good Effect of Deoxidizing Brass and Bronze Scrap and New Metal by Magnesium," which contains a table showing the results of tests made on brass, red metal and bronze, both with and without magnesium. The firm has also issued a folder about antimony and its relations to babbitt antifriction and other metals in which the composition of Britannia metal, pewter, babbitt, linotype and electrotype is given.

Electric Service Supplies Company, Philadelphia, Pa.—This company has issued its new car equipment catalog, mention of which as being in preparation was first made in the *Keystone Traveller* for May. The publication is the second volume of the company's Catalog No. 4, and pertains exclusively to car equipment specialties and maintenance supplies. To cite one subject as an indication of the thoroughness of the work, 36 pages are devoted to headlights, signal lamps and accessories. Conversion tables, a special telegraphic code and an index are presented at the back of the catalog. Volume 3 of Catalog 4 will be issued soon and will relate to general electrical supplies.

National Brake Company, Buffalo, N. Y.—Since Jan. 1, 1908, this company has issued every month a leaflet about some important installation of its brakes. Taking the leaflets for the six months an excellent illustration is furnished of the increasing use of the brake. Perhaps the most important installations mentioned are brakes for 300 pay-as-you-enter cars in Chicago, 50 for Buffalo and 200 in New Jersey. The Chicago City Railway, as an instance, has 1700 type C brakes in use and the International Traction Company has more than 400. All the cars of the Nashville Railway & Light Company are equipped with Peacock brakes. Sixty-five companies installed the brakes during 1907. One hundred cars recently built for the Boston Elevated Railway also were equipped with Peacock brakes. The company has received unsolicited from several street railway companies the results of tests conducted by them without the knowledge of the National Brake Company showing what the brake will do under the most trying conditions.

ELECTRIC RAILWAY PATENTS

UNITED STATES PATENTS ISSUED JULY 21, 1908.

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

Warning Signal for Air-brake Systems, 893,605; Benjamin Brill, Jr., North Bay, Ontario, Can. Means for automatically placing an auxiliary reservoir in communication with a pneumatically operated signal when the pressure in the air brake system falls below a predetermined amount.

Railway Brake, 893,611; William H. H. Diffenbach, Yonkers, N. Y. App. filed March 9, 1907. In a brake mechanism for vehicles, means for independently connecting, one by a thrust and the other by a pull forward, distinct systems of brakes with a source of mechanical power.

Track Instrument for Railway Signals, 893,612; John F. Dineen, Geelong, Victoria, Australia. App. filed Aug. 8, 1906. A mechanical tappet for use with railroad signals, having a yielding rail support with a lever connection to a contact, so that when the rail is depressed by weight of a locomotive the contact is closed.

Railway Crossing, 893,693; Lewis Alexander and Samuel L. Gano, Clinton, Ill. App. filed Feb. 29, 1908. Consists primarily in a base plate provided with a peculiar arrangement of slots, and rail-carrying tumblers journaled in four independent bearings adapted to be separately bolted to the plate according to the angle of the crossing.

Railroad Switch Signal, 893,730; William H. Harris, Stark, Mont. App. filed Dec. 16, 1907. Intended to notify an incoming train whether or not a switch has been left open. Has also definite distinct signals indicating exactly which one of a number of switches has been left open.

Electric Signal for Railways, 893,731; William H. Harris, Stark, Mont. App. filed Jan. 6, 1908. A block signal system making use of sectional track rails electrified by a direct current and including signal lamps in the circuit which are extinguished by the short circuiting of the rails by a passing train.

Switching Indicator, 893,757; Warren L. Sullivan, Newark, N. J. App. filed Oct. 3, 1907. A dispatching system to facilitate the switching of railway trains from a main track or section of a single track to any one of a number of branches leading from such section.

Rail Brace, 893,928; Alexander J. Knouse, Benton, Pa. App. filed Aug. 17, 1907. Comprises two rods bent on themselves to form rail engaging extremities, the opposite end of each rod having screw threads, and adapted to pass freely through an endless loop. Nuts engage the ends of the rods inside of said loop.

Railway Tie and Means for Securing Rails Thereto, 893,941; Louis G. Sedberry, Wetumpka, Ala. App. filed April 22, 1907. The greater portion of a metal I-beam is embedded in concrete, the top flanges having clamps for securing the rail.

Track Rail Fastener for Railroads, 893,962; John T. West, Bowling Green, Ky. App. filed Nov. 29, 1907. A track rail fastener for repairing a track, the improvement being adapted for quick application.

Metallic Railway Tie, 894,028; Anthony Miller, Cape Girardeau, Mo. App. filed July 30, 1907. Comprises a tie having a rail seat and an integral flange at one side of the seat for engaging one side of the base of the rail, a movable flange for engaging the other side of the base of the rail and spikes adapted to be driven through apertures in the movable flange and tie, to be clenched at their lower ends, the heads of the spikes engaging the movable flange and the points of the spikes being clenched on the outside of the tie.

Rail Splice, 894,038; William D. McKeown, Olex, Ore. App. filed Jan. 19, 1907. A form of splice joint, the end of one rail having the tread and half of the web and base cut away. The opposite half of the web and base is cut away from the other rail end. The two webs are then bolted together without the use of fish plates.

Railway Tie and Connection, 894,072; George H. Shane and Robert E. Foresman, Denver, Colo. App. filed Dec. 21, 1907. Details of construction.

Extension Step, 894,088; Emma V. Wells, Decatur, Miss. App. filed Dec. 10, 1907. The extension step is mounted on sliding rods controlled by lever mechanism.

Railway Tie, 894,090; Harry L. Williams, Denver, Colo. App. filed Jan. 9, 1907. Comprises a shell of sheet metal having side extensions bent downwardly, end extensions bent downwardly and having their side edges bent laterally over the side extensions to prevent spreading of the latter, and a filling of plastic material in the shell.