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*Of this issue of the Street Railway Journal 8500 copies are printed. Total circulation for 1907 to date 98,150 copies, an average of 8179 copies per week.*

## The News Service of the Street Railway Journal

With this issue the STREET RAILWAY JOURNAL has adopted a system of classification of its Construction Notes which, it is believed, will make this information much more readily available than heretofore. The news section of this paper is considered by its editors of the greatest importance, and as much time and energy is put upon this department as upon any other. We have never believed in simply wait-

ing for the news to be sent in. We have gone after it.

While a few news items are published in the early pages of each issue, the department proper consists of the shorter articles with captions in the concluding pages of each issue and of the briefer notes published under the headings of "Construction Notes," "News Notes" and "Financial Notes." A prompt, reliable and complete service in this department costs money as well as a large staff for collecting and editing these notes. The STREET RAILWAY JOURNAL possesses the latter, and in the interests of its subscribers has never stinted the former. The great development of the electric railway field during the last few years has naturally brought about an increase in the number of items published each week, and has suggested the adoption of a classification in addition to that already followed. Up to this time the items under the heading "Construction Notes" have been grouped alphabetically by States and then by cities in the State. This arrangement, which has been followed for a great many years, makes it possible for any subscriber who is interested in any particular section of the country to locate readily all of the news items relating to new roads or extensions in any city or State. This arrangement will be continued; in addition, however, and for the convenience of those interested in special portions of the work, a key has been added which will make apparent at a glance the nature of the items. This key provides for three grand classifications, viz.: proposed roads not previously mentioned; additional information regarding new roads; extensions and new equipment for operating roads; the signs are respectively the asterisk, the letter "o" and the dagger. In addition, there will be numerical designations, as follows: (1) for items relating to track and roadway; (2) for items relating to cars, trucks and rolling stock; (3) for power stations and terminals; (4) for car houses and sub-stations, and (5) for parks and amusement enterprises. In short, the new plan combines in one the essentials of both the subject and geographical classifications without any sacrifice of either, and will, it is believed, result in the even more extended use than ever before of that part of the paper devoted to the "News of the Week."

## The Electrification of Railways

The literature on the subject of electrification of steam railroads received another important addition in Mr. Stillwell's letter which was published last week, and which seems to clear up in a very satisfactory way the question of relative fuel consumption on steam and electric railways so far as present knowledge permits. It is true that no direct comparison of operating results can be made between electricity and steam under normal trunk-line conditions, because as yet the former power has not been applied to that class of service. For this reason Mr. Stillwell was obliged

to fall back upon the results secured on the Manhattan Elevated Railway, but explains why he considers these figures, when reduced to a ton-mile basis, to be comparable with those which might be expected in trunk line service with 300-mile sections. Of course, the conditions in elevated and trunk line operation are quite different, but a large factor of safety is provided in applying the elevated figures on account of the frequent stops made in the Manhattan service. Against this comparison the steam railroad advocates may claim that the estimate, however favorable to electric operation, is based throughout on a combination of the advantages of single-phase distribution with the favorable conditions of performance actually found in d. c. operation. They may admit the conclusions provided the single-phase system should meet all the expectations of those who are now engaged in its development, but they can very properly say that at the present moment concrete data on the performance and even the construction of big single-phase motors are not generally available. Moreover, when made public, these figures will still involve the uncertainty inseparable to the passing from test conditions to commercial performance. We mention this condition simply on account of the great importance to those who wish to see the single-phase system accepted of issuing promptly all the definite information possible relating to this subject.

Independent of the question of single-phase operation, however, we think that all will agree that electrical conditions are constantly improving. The possibility of direct generation of potentials as high as 15,000 volts in some cases and in others of transmission under commercial conditions at 60,000 volts has introduced economies in this branch of the work alone which were not considered in the comparisons of a few years ago, so that it is not surprising that estimates of the saving from electric operation should grow more optimistic. In the matter of saving fuel, therefore, the electric locomotive may be confidently expected to meet reasonable expectations. Fuel cost, however, is not a relatively large item in the cost of railway service, and any delay which may occur in extending electric operation to trunk lines, in our judgment, will lie elsewhere. The greatest obstacle is partly a lack of general realization of the advantages other than economical possessed by the electric system, but more than this to the heavy cost of equipment. The conditions, as recent events have shown, are not favorable to the issue of new securities. Whether the railroads are over-capitalized or not, and this is denied by those who claim that it would be impossible to duplicate the present properties with the par value of the present obligations, there is no doubt that the security market is in a super-saturated condition. The gain to be accomplished by a change of motive power must be very big and very certain to win the necessary public confidence. A new line can afford to take a bolder stand than one hampered by existing equipment. It is to this class of road, therefore, rather than to the older ones, that we look for immediate demonstration of the full advantages of electric operation, now that some of the more conservative older systems have begun to show the way. Missionary work such as Mr. Stillwell has been doing is a very important factor in putting this work on a proper basis and of establishing the practicability and economy of electric traction.

### Electric Locomotives

As might reasonably be expected at this particular time, the discussion at the recent meeting of the New York Railroad Club, which is reported elsewhere in this issue, turned in the main toward the matter of the Woodlawn catastrophe, on which we have already commented. The fact that an electric train was the victim has certainly drawn public attention to the case to an unusual and unfortunate extent. As Mr. Sprague very pertinently intimated, accidents of similar character have often happened and have since occurred in ordinary railroad service. In this instance it is at least an open question whether the track would not have failed had the train been drawn by an ordinary steam locomotive. The calculations of strain which have already been published show that, upon the whole, considering the speeds and forces, an electric locomotive is rather easier on the track than its older rival. But, undeniably, the strains are differently distributed in the two cases, so that the factors of safety must be shifted accordingly to give equal security at the weakest point. The lateral strain due to the lower center of gravity of the electric locomotive as at present built, and the relatively lessened downward component tending to hold the rail in place demand special consideration, even if the computed values show that the factor of safety against shearing is not seriously impaired.

Mr. Vauclain's judgment in such matters is entitled to very great weight, and he touched upon one consideration that seems important in calling attention to the fact that a locomotive, be it steam or electric, takes a curve in a series of broken tangents. No computation of the stresses as static pressure can take account of this condition, although it has a vital bearing on the factors of safety in the track. The problem of safety in heavy electric traction, however, is no more difficult than in case of steam locomotives. In either case the track is the important thing. The ideal railway should have few and slight curves and grades. Curves in particular have been danger spots ever since the beginning of modern transportation, and they are not likely to become the safer as weights and speeds increase, whether through steam or electric operation.

### Park Problems

Besides the general discussion of park problems and descriptions of electric railway pleasure resorts which appear from time to time in the *STREET RAILWAY JOURNAL*, it has been the custom of the publishers of this paper to devote a considerable part of two issues during the early part of the year to this department of electric railroading. For this reason the issue of Feb. 23 was devoted to various articles connected with the construction and management of electric railway pleasure resorts. The subject is continued in this issue by the publication of descriptions of attractive park resorts at Seattle, Trenton and Newark, discussions on some of the problems in park management, and a review of a number of attractions which are offered this year for the entertainment of patrons and which were not described in the issue of four weeks ago.

If a canvass of the sentiments of managers in all parts of the country should be taken in reference to the park ques-

tion, the evidence in favor of creating and maintaining summer parks would be overwhelming. There is no room to doubt the wisdom of making efforts to stimulate pleasure and recreation traffic, but as soon as detailed methods begin to be discussed, great differences in opinion appear. The particulars of park design and operation are entirely unstandardized. We desire, however, in this place to call attention to one or two points in connection with park operation which seem worthy of consideration.

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Some interesting and frequently perplexing power distribution questions sometimes present themselves in connection with park business and summer pleasure travel on electric railways. It is the peak load problem over again, but it is a yearly peak that is to be cared for, in addition to the usual daily variations in the station load curve.

In the design of electric railway power stations one of the so-called "necessary evils" is that a considerable portion of the station capacity must lie idle during the greater part of each twenty-four hours in order to have available a sufficient capacity to care for the daily peak. The amount of investment in such apparatus of course varies with the particular case, since the shape of the load curve changes with the requirements of the patronage served. The summer load usually brings about largely the same conditions; that is to say, a considerable additional investment, either in station capacity or feeder copper or both, to care for the annual peaks incident to summer park or pleasure travel. This annual peak, when it exists, may last from two to six months, according to climatic conditions, although it may be balanced to some extent through the year, in many cases, by the loads occasioned by winter weather, such as bad track conditions, electric heaters, etc. But even when the summer and winter total power station peaks balance fairly well, it is rarely the case that the heavy load is distributed in the same manner during the two seasons. In most cases the winter load comes proportionately from all parts of the road, while the load during the summer peak is generally concentrated on the particular parts of the system where parks are served or where pleasure riding is greatest. This means, at the least, that a considerable investment must be made in the trolley feeders which is unnecessary during the winter season, and, in the case of interurban roads served from more than one station, may also require a large investment in power station or sub-station machinery which is non-productive during the greater part of the year.

In cases of high tension alternating-current distribution to rotary converter sub-stations from a central power station, this idle investment in station apparatus, and to some extent in trolley feeder, can be, and in some cases has been, avoided by the use of portable sub-stations. In some instances, where practically no load or very little load exists on these park lines during the winter months, the portable sub-station may be complete in itself, and may be operated during the summer months either on a siding or in a house provided for it near the peak load center of distribution. In other instances, the portable sub-station may be used to increase the capacity of a permanent sub-station whose fixed apparatus is only sufficient to care for the regular winter loads. In this latter case, of course, no saving is

made in trolley feeder, which must be sufficient to care for the heaviest loads, and part of the investment is practically idle during the lighter winter loads. Where the portable sub-station is used at a distance from a permanent sub-station, the low-tension copper necessary for distribution from it at short distances during the heavier summer loads can also be used advantageously in many cases for the lighter winter loads on account of the longer low-tension transmission from the nearest fixed sub-station. There would, of course, in this case, be an idle investment in high-tension transmission copper. This investment, however, would usually be small in comparison with that required in the low-tension circuit.

These portable sub-stations, used as described to help out during summer loads at some parts of the system, might be employed to advantage at other points during the winter. They are of particular advantage for such double use where a company operates interurban service as well as local service in intervening cities on its lines. In such case, the winter peaks will occur at the cities, on account of electric heaters, worse track conditions and more frequent stops in the cities, and the sub-stations can be located at these points, while in summer, due to pleasure riding and park loads, the load is more likely to come in a greater proportion on the sub-stations serving interurban loads almost wholly.

The portable sub-station, which was first designed purely for emergency use to avoid the idle investment which otherwise would be required for spare units in each station, has been found most useful in caring for these annual and semi-occasional peaks, and it may well be considered in planning power distribution systems where such irregularities in the load are expected.

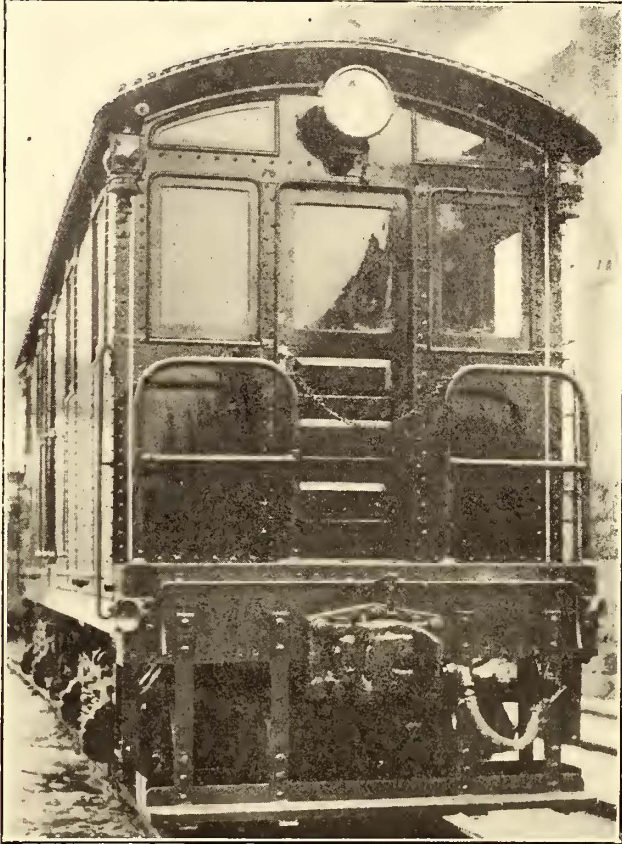
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As the labor item is one of the heaviest sources of expense in the operation of a street railway park, any legitimate reduction in it is well worth securing. Obviously, the number of employees on hand should vary with the patronage, and in case regular uniformed men are kept in service all day, regardless of whether the park is largely visited or practically empty, the cost is likely to be very large.

In some towns students can be employed profitably in the late afternoon and evening hours, on Saturdays and Sundays, as well as holidays, in connection with street railway park service. The peak loads of the park usually come at times when the students are relatively free, and in the summer season the balance of the day is generally available for other uses. Students have long found it profitable to work in the summer on trolley cars as motormen or conductors, in summer hotels or in shops. In some cases where a knowledge of boating and swimming is required, vacation work at a street railway park may be thoroughly profitable to both health and pocket. As a general thing, college students make excellent employees in dealing with the public; their address and courtesy are valuable assets, and whether such men are utilized as ticket takers, supervisors of concessions, engineers of steam launches, or caretakers of the property, there is not much doubt of their usefulness to the company, and often at rates which are less than would be required to maintain a regular force at the park throughout the entire week.

## ELECTRIC FREIGHT LOCOMOTIVE BUILT BY THE BROOKLYN RAPID TRANSIT COMPANY

The Brooklyn Rapid Transit Company has just completed what is probably the largest electric locomotive thus far



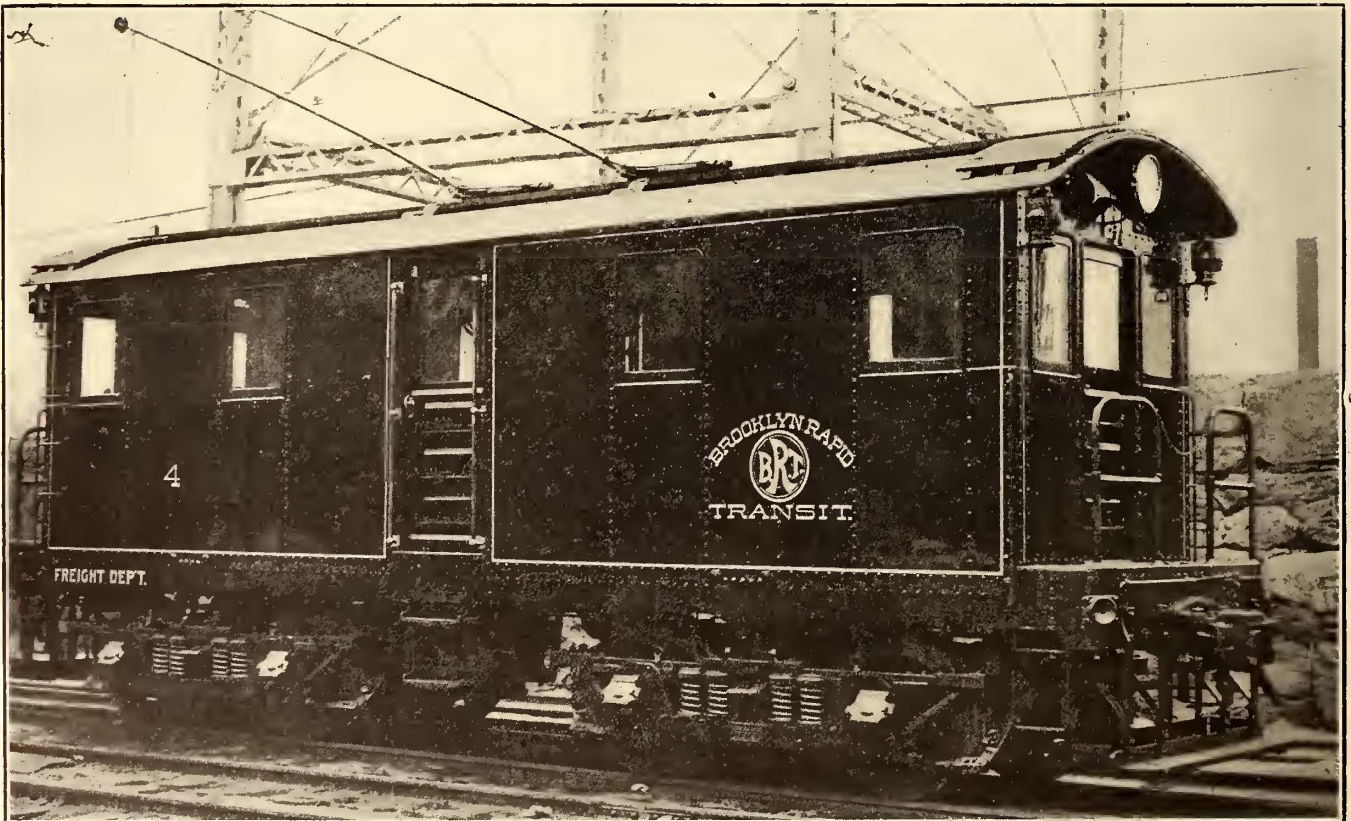
END-ON VIEW OF BROOKLYN FREIGHT LOCOMOTIVE

built by a city railway. It will be used for hauling as many as twenty standard freight cars from the Bush freight terminal docks and warehouses in South Brooklyn to Coney Island, about 5 miles distant. Although all of the company's freight haulage to Coney Island is over rights of way covered by its steam railroad charters, the steam haulage service has been abandoned to reduce operating and maintenance expenses, besides avoiding any further necessity of operating noisy steam locomotives through a highly-developed suburban territory.

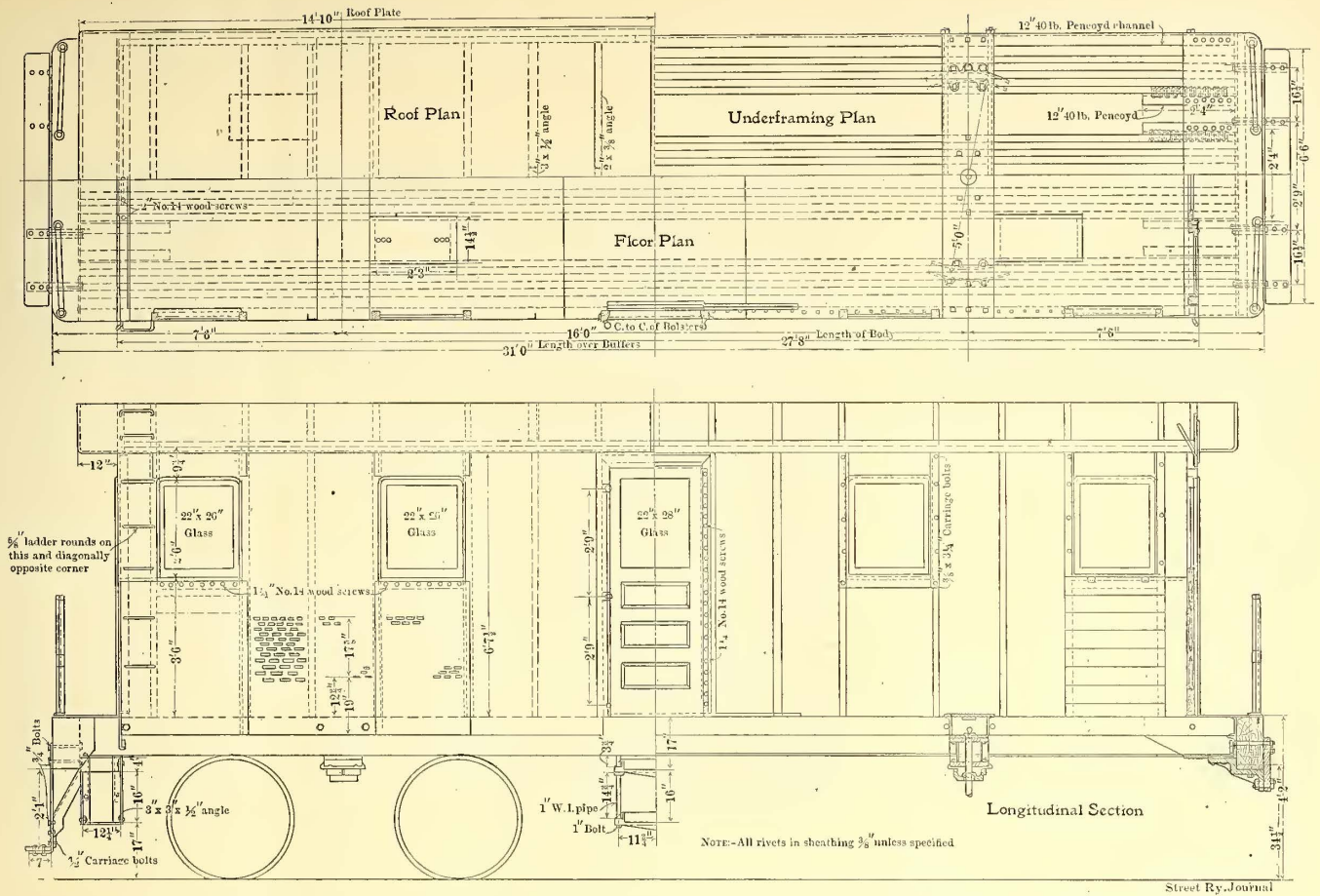
In general appearance the new locomotive is a distinct departure from the sloping-end type, and resembles in exterior appearance the New Haven Railroad's single-phase locomotives for passenger operation. It is 31 ft. long over all and 7 ft. 3¼ ins. wide over the side sheathing. The total weight including the apparatus is about 57 tons. The underframe is made up of 2¼-in. x 6-in. bar iron used for the double purpose of insuring sufficient strength and adhesion. The bars are fastened at the end by being bolted together with 2-in. rods, the outside bars having a 12-in., 40-lb. Pencoyd channel riveted to it. This channel in turn is riveted to the top and bottom end sill plates.

The side sills are built of 12-in., 40-lb. channels of special Pencoyd section; the end sills consist of ¾-in. plates 16 ins. wide, tied to both the side and center sills and protected by a buffer beam made up in sections of 3-in. x 8-in. oak laid on top of each other. The end sills are tied at the top by a ½-in. x 24-in. plate which extends clear across the buffer, and at the bottom by a ½-in. x 16-in. plate. The side and end framing consists of angle iron and No. 10 sheet steel. The latter is also laid on the floor and roof. To prevent all possibility of grounds from contact with the trolley wire, the roof has another covering, consisting of ⅝-in. whitewood topped with canvas. The body of the locomotive is painted black outside and green inside.

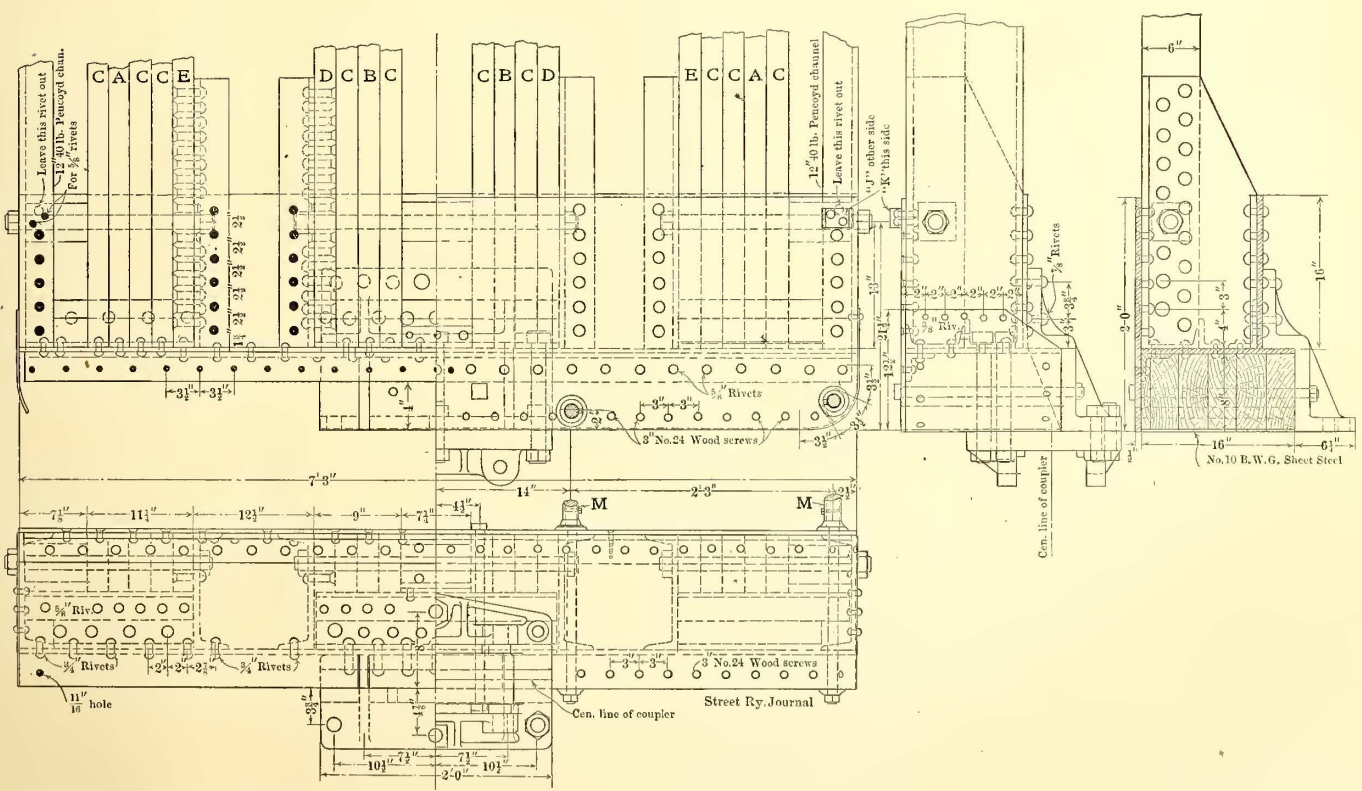
The bolster consists of flat bar steel with a top plate 1¼



SIDE VIEW OF THE BROOKLYN RAPID TRANSIT COMPANY'S ELECTRIC FREIGHT LOCOMOTIVE



PLANS AND ELEVATION, SHOWING CONSTRUCTIONAL FEATURES OF BROOKLYN FREIGHT LOCOMOTIVE



BUFFER ASSEMBLY OF BROOKLYN FREIGHT LOCOMOTIVE

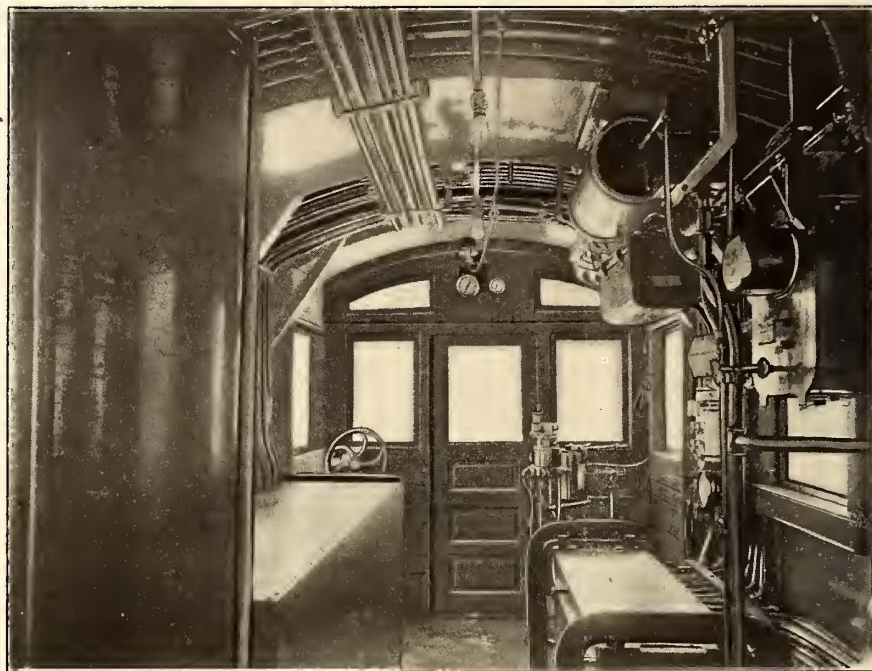
ins. x 12 ins. and a bottom plate 1½ ins. x 12 ins. The filler is not a pressed shape, but consists of a 6-in., 13-lb. channel cut at the ends and reinforced with angle iron. The center plates are of steel and have machined lugs fitting into the bottom of the bolster plate, as well as lugs extending over the sides. Both ends are furnished with Gould automatic couplers No. 870. The locomotive is furnished with a hinged door and two windows at each end and four windows and a sliding center door on each side.

The two trucks are of the Baldwin type with 37-in. diameter steel-tired wheels. The truck wheel base is 5 ft. 10 ins., and the distance between truck centers is 16 ft., which is 1 ft. 6 ins. more than the New Haven locomotive. Each truck carries two 50-B Westinghouse motors rated at 150 hp each and geared 15:54. Two trolley wheels are required to collect the current.

All of the machinery, air reservoirs, etc., except the motor compressor, are placed inside the car. Special precautions were taken to prevent grounds. All suspended material is insulated from the hangers with insulated bolts, and the wires are run in loricated conduits. The motorman's sections, which are in diagonally opposite corners, have a raised floor covered with a rubber mat, and a similar rubber covering will be laid down the center aisle of the locomotive.

The control system is of the unit-switch 251-A type. Manual control has been retained and the limit switch and line relay omitted because for a great portion of the time the locomotive will be used for switching service. The first

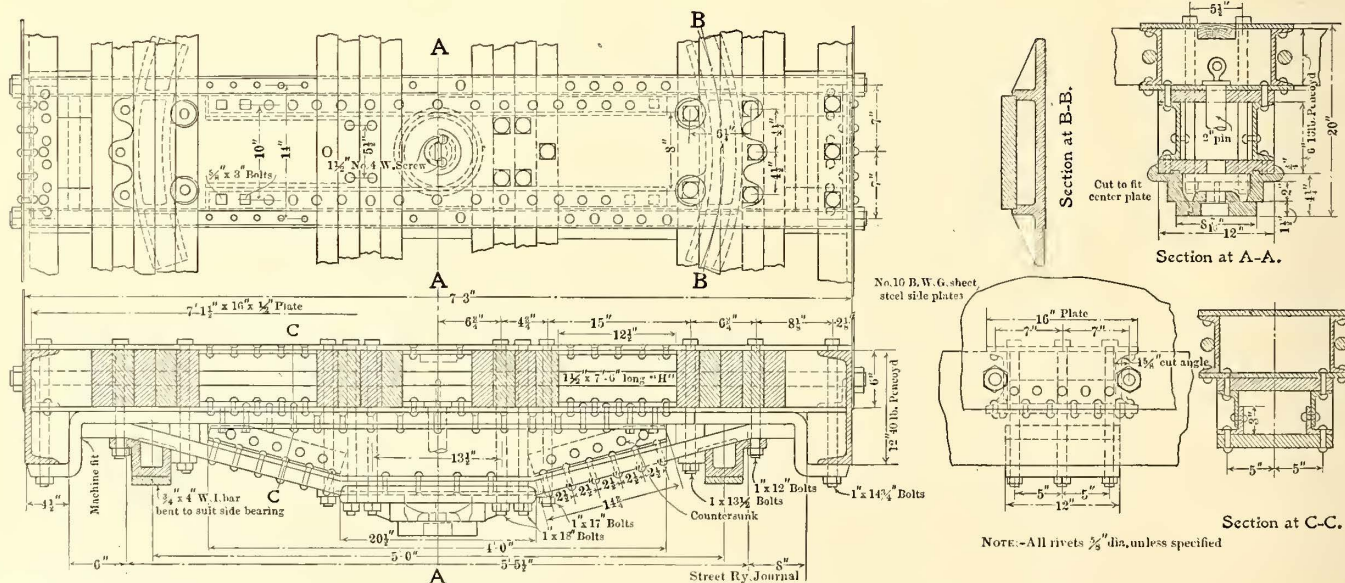
boxes. They are cooled through slits made in the side of the locomotive. The contactors are also mounted in the car. The reversers and automatic line switch are hung from the angle-iron carlins, and the main line switch is hung on brackets suspended from the ceiling. The two motor



INTERIOR OF BROOKLYN LOCOMOTIVE, SHOWING ONE OF THE RESISTANCE BOXES AND STORAGE RESERVOIRS AT THE LEFT, CONTACTOR BOX AT THE RIGHT, SWITCHBOARD, MOTORMAN'S STAND, ETC.

cut-outs used in connection with this switch (each for one pair of motors) are hung from the ceiling in metal boxes on opposite sides of the car.

There are three main lighting switches and two change-



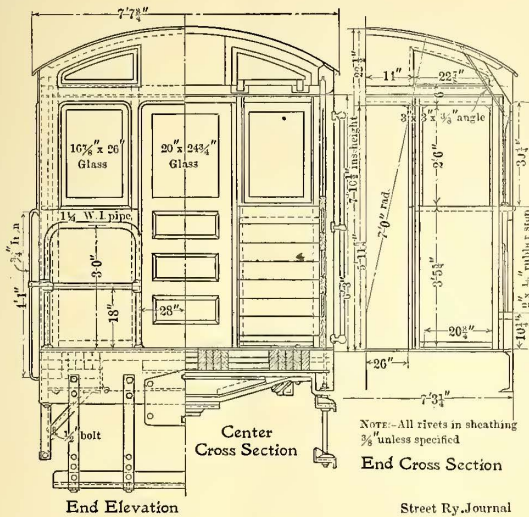
DETAILS OF BOLSTER OF BROOKLYN RAPID TRANSIT COMPANY'S FREIGHT LOCOMOTIVE

notch of the controller gives the "coupling" position when it is intended to move the locomotive a few inches in coupling cars. On this notch two extra resistance frames are inserted; in addition there are seven more series and seven multiple positions. The resistances are mounted on each side of the locomotive, and are enclosed in sheet-iron

over switches. The former are for the 50-cp headlights, gage and marker lamps, and on the center circuit are five 16-cp. incandescent lamps. One change-over switch changes the marker and gage lights and the other the headlight. These switches are mounted on a side wall panel at one end of the locomotive.

The battery-charging current comes through the compressor motor circuit but no current can flow to the batteries until the energizing of a relay which closes the battery circuit. This prevents the current to the compressor from reaching the battery until the opening surges have been smoothed down. This feature is a change in the practice of the Brooklyn Rapid Transit Company, as the other equipments charge through the lighting circuit.

The air-brake equipment is of the Westinghouse E. T.



END ELEVATIONS AND SECTIONS OF LOCOMOTIVE

graduated release system with a straight-air attachment for the locomotive. This makes it possible to apply brakes on the locomotive alone, which is particularly convenient for switching, while all the automatic features of the brake system are fully retained. The two air storage reservoirs are mounted vertically inside the locomotive near the center. They are 1 ft. 8½ ins. in diameter by 6 ft. 6 ins. in height and have a storage capacity of 14.9 cu. ft. The air is used also for operating the locomotive bell located under the car body, the air whistle at each end, the electro-pneumatic control and the air sander.

From the accompanying half-tone illustrations it will be noted that there are two grab-handles and steps in the center and at each end; side ladders to the roof, and receptacles under each bumper for loose links. These receptacles are made of two steel plates turned up at the sides.

This locomotive was designed by W. E. Johnson, under the direction of W. G. Gove, superintendent of equipment of the Brooklyn Rapid Transit Company.

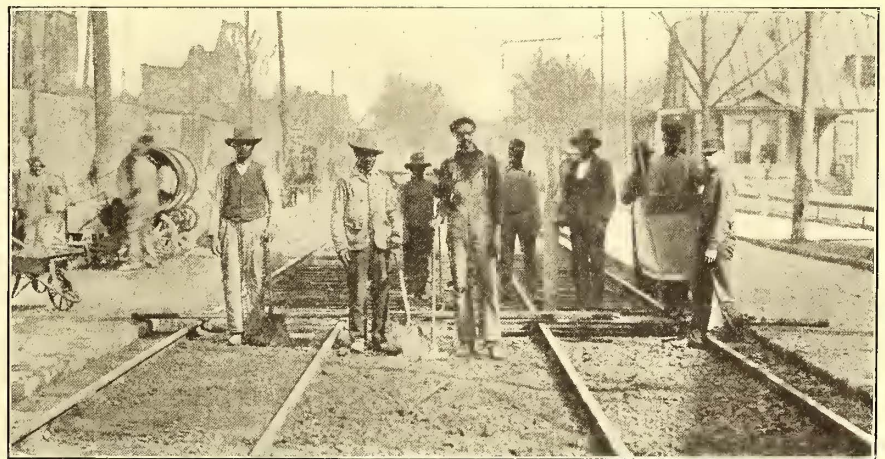
### SCHOOL OF RAILWAY ENGINEERING

The University of Illinois has recently organized a School of Railway Engineering with three engineering courses, viz: civil, mechanical and electrical, all arranged especially to provide training for railway service. In addition the department of economics of the College of Literature and Arts has added to its courses of training for business a course in railway administration. In this course special attention is given to corporate and financial organization, economic location and traffic management, including rate making, and to railway accounting and auditing.

It is expected that these courses will prepare men to become efficient workers in the departments of motive power and maintenance of way and in the financial, traffic, and operating departments. In the three engineering courses more than the usual time is given to economics, and the course in administration comprises enough work in engineering to give students an understanding of the technical problems.

### TRACK CONSTRUCTION AT HOT SPRINGS

Practically all of the tracks of the Hot Springs Electric Railroad, Hot Springs, Ark., are being reconstructed. In paved streets creosoted ties are laid on a 10-in. bed of crushed stone and the ties are then tamped and the space between them is filled with a soft grout. This grouting sinks through to the lower bed and makes it solid for several inches below the ties. The concreting is carried only to the ends of the ties, as the United States Government, which has charge of the paving in the reservation, places against the ties stone stringers 18 ins. high and 4 ins. thick. All of the space between the stringers is paved with brick laid on a 2-in. cushion of sand. Cement is poured into the cracks between the bricks. The company is fortunate in having an unlimited supply of rock. The bluffs on either side of the main street of the town are composed of "evaculite" rock which is the material from which the Arkansas whetstones are made. All of the rock used in track construction is quarried from property owned by the company on this main street. A steam-driven crusher, together with elevators and storage bins, is located on this property. Because of the flinty nature of the rock special jaws of manganese steel are used in the crusher, and



TRACK UNDER CONSTRUCTION, SHOWING STONE STRINGERS AT THE OUTSIDE

even these are worn out after about one month's use. In mixing the concrete an electric portable concrete mixer is used. This was formerly driven by a gasoline engine, but has lately been equipped with a 500-volt motor. The motor and drum are mounted on a two-wheel truck provided with a handle at one end by which it is pulled along as the work advances. The motor, which is of 5-hp capacity, is suspended underneath the top frame. It has reducing gears and drives the drum by a sprocket chain. The mixer is provided with a 200-ft. reel of wire so that the machine may be moved as the work progresses without changing the trolley. Ed. Hardin, superintendent of the system, reports that with the mixer a crew of nine men and a foreman can lay 566 sq. yds. of concrete in nine hours, tamping all the ties. This brings the labor cost down to 2½ to 2¾ cts per yard.

**SINGLE ENDING CARS WITH A NOVEL TURN-TABLE AS RECENTLY INSTALLED BY THE PUBLIC SERVICE CORPORATION AT HOBOKEN, N. J.**

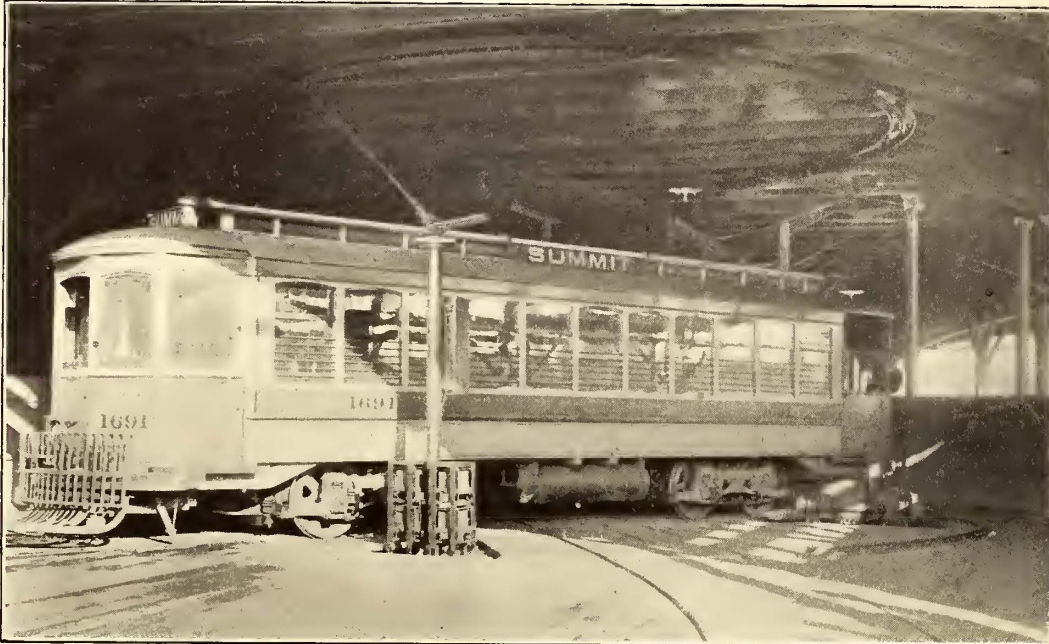
BY MARTIN SCHREIBER

The terminal of a number of lines of the Jersey City, Hoboken & Paterson Street Railway Company is at the

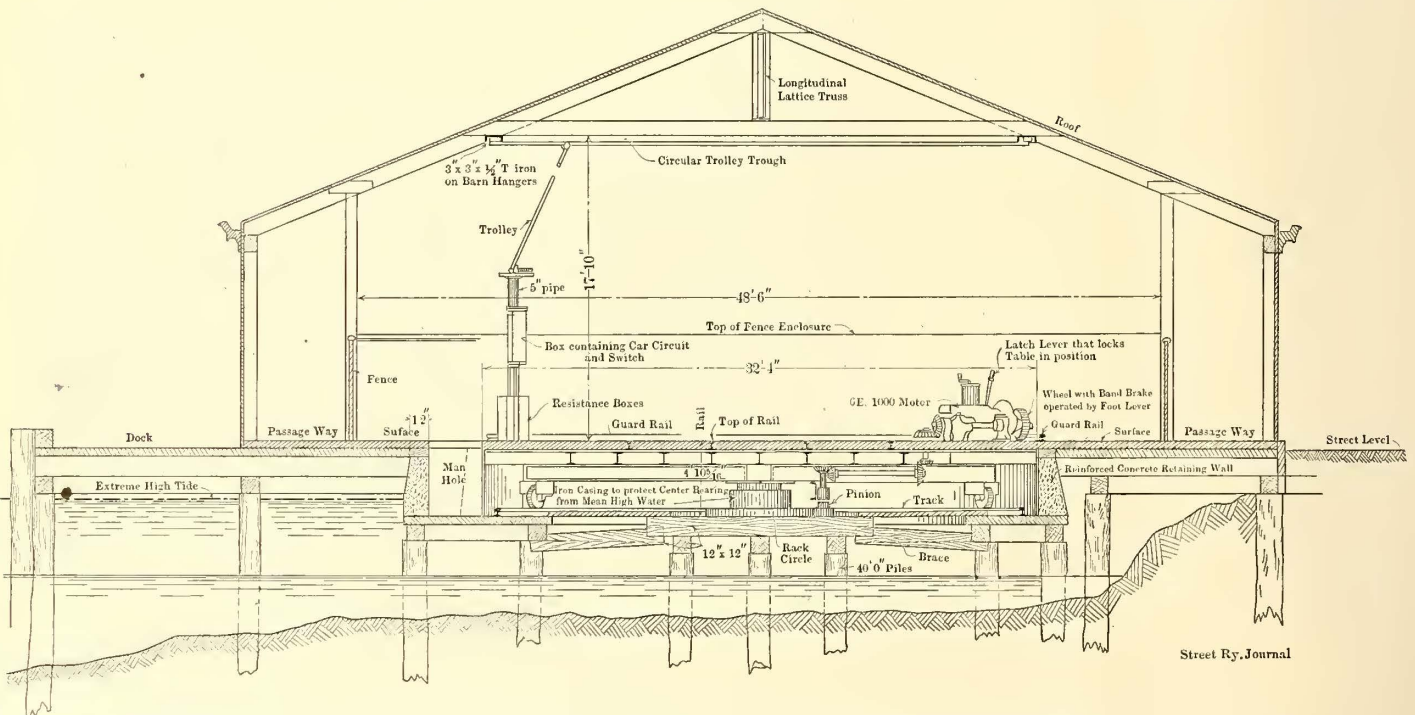
conditions it was impossible to install loop tracks that were not objectionable.

The only available space at hand was an area on the dock proper, that has a total width of 60 ft., and part of this space had to be reserved for a passageway for those patronizing the lines to go to and from ferries. On the north side of the fence, as shown in general layout, is a ferry slip, and on the south side of line of approach is a wagonway to the ferry. Neither of these areas could be encroached upon in any way.

After considering several schemes to overcome the situation, the management of the company decided to install a special turn-table, as the ordinary type was not applicable, because in the rush hours it would be necessary to turn three or four cars per minute. The turn-table adopted is electrically-driven, with three sets of tracks crossing at an angle of 60 degs., so arranged that the entering and leaving tracks to the table approach at the same angle. It will be



VIEW OF CAR ON TURN-TABLE. THE RESISTANCES WILL BE NOTED ON THE LEFT, AND THE OPERATING MECHANISM ON THE RIGHT



CROSS-SECTION OF TURN-TABLE, FOUNDATION AND COVERING, SHOWING PARTICULARLY THE PROTECTION AGAINST HIGH TIDES

Fourteenth Street Ferry, Hoboken, N. J. The lines included are the Union Hill, Bergen Turnpike, Bergenline Avenue, Washington Street, Summit Avenue, North Bergenline Avenue and Willow Avenue. The ferry terminal is the property of the Delaware, Lackawanna & Western Railroad Company, and on account of the peculiar physical

seen that this track layout allows a car to be single-ended by turning the table through only 120 degs.; and also that when the table is in position to receive a car advantage of the same position can be taken to remove one.

The problem was complicated further by the necessity of installing the table on piling. How this was done is shown



in the accompanying section of the foundation as well as of the table proper. The roof over the dock also had to be removed temporarily while the installation of foundation was carried out.

A cluster of sixteen 40-ft. piles was driven to refusal with 12-in. x 12-in. yellow pine capping to form the foundation of the main bearing for the table. Outside of this a ring of forty-two piles was driven in the same manner, with 12-in. x 12-in. capping. On this piling a circular 6-in. plank floor was placed to hold the run-rail of the table. This planking also formed a footing for the reinforced concrete retaining wall as shown.

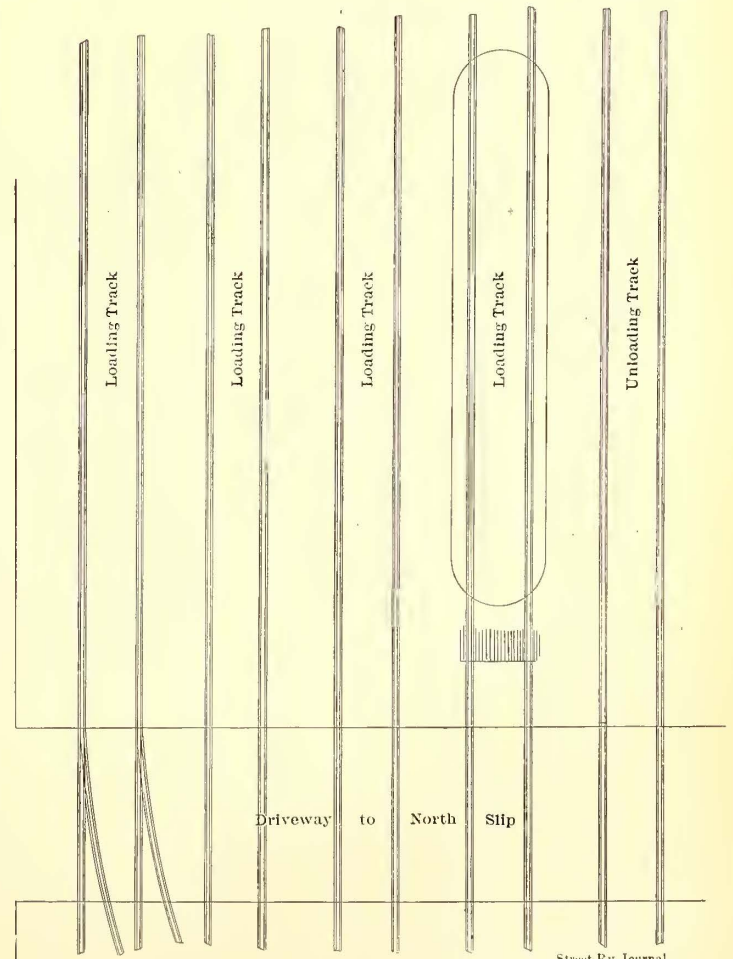
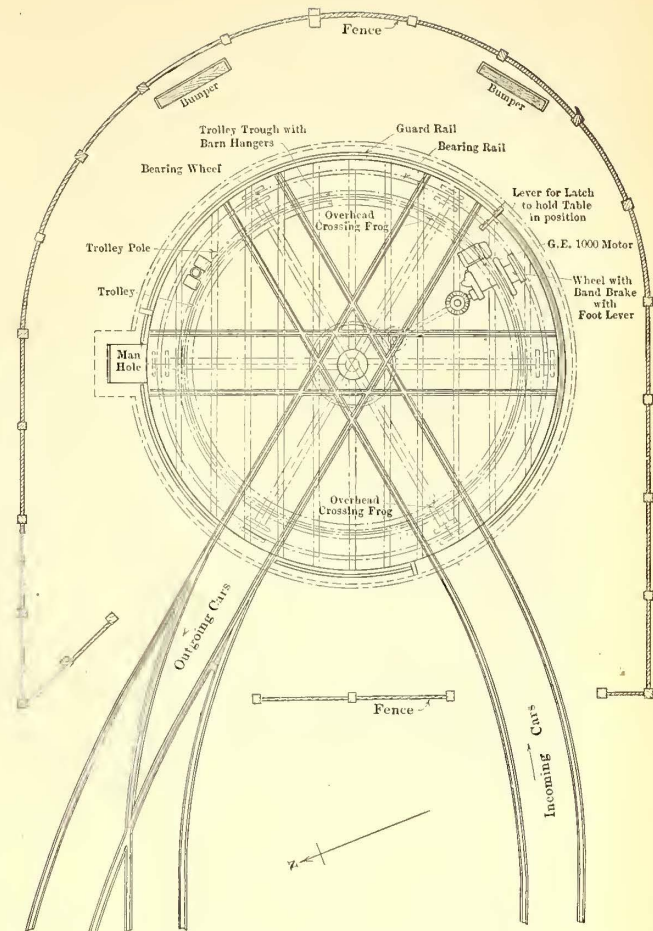
The table was built by the American Bridge Company. It is 32 ft. in diameter and is made up structural steel framing, covered with a 3/8-in. steel plate. It turns on a center bearing and 8-in. pivot resting on three discs, two of them of hardened steel and the center one of phosphor bronze. The balance wheels are six in number and run on a circular T-rail fastened to foundation. The gears and pinions of train connecting the motor to the rack circle are of cast steel and the shafting is of hammered steel.

From observations on the site it was ascertained that at high tides the water would rise to within 17 ins. of the floor line. This condition thwarted the original scheme of placing the motor under the table and forced the abandonment of feeding the motor from underneath with a ring and brush arrangement, as is done ordinarily with drawbridges. However, the high water was avoided by placing the motor on top of the table. On account of the number of tracks and allowance for the necessary overhang of the cars it was possible to get barely enough clearance with the motor placed as shown in the illustrations. The center bearing of table was set in a water-tight receptacle made of sheet iron and built in the form of a cylinder.

The motor, which is of the regular G. E.-1000 type as used on the cars, is fed from an overhead wire through a standard trolley pole fixed to a 5-in. pipe. The latter is held by a base casting, bolted to the floor of the table in opposite position between tracks from where the motor is placed. Current is fed into a 3-in. x 3-in. x 1/4-in. T-iron, which is bolted by barn hangers to a circular trough attached to the roof trusses. The circular trough is of a radius 2 ft. less than the outside rim of the table. The bottom is made up of two thicknesses of 7/8-in. maple, cut to the required curvature and with overlapping joints, while the sides are of 7/8-in. x 4-in. white pine. A trolley wire is placed directly over the leaving and entering tracks and crosses the T-iron, being snubbed on the roof in the rear. Where the trolley wire crosses the T-iron standard crossings were placed. It was possible to use the regular 90-deg. crossing, as the rail enters on a tangent with a circular trough; then a special crossing had to be placed where the two trolley wires crossed directly over the center of table.

Originally it was intended to operate the motor with a controller on the outside of the table between the entering and leaving tracks, but this idea was given up, as it would have been necessary to reverse the motor, which would have involved the unfavorable condition of having four lead wires from the controller to the motor on the table and four contacts with the trolley. The controller then was placed on the table near the motor, and instead of using the brake that was to be employed on the outside rim of the table, the same purpose was accomplished by using a rim brake on the countershaft of the motor and operating it with a foot lever.

Besides changing the brake it was necessary to reverse the latch that holds the table in the proper position when it



PLAN OF TURN-TABLE AND TRACKS. ALL FOUR LOADING TRACKS ARE PROVIDED WITH ENTRANCE CURVES

is in place for taking or receiving cars. A latch lever also had to be placed near the motor convenient for the operator. This is simply a bell crank, the bottom of which rests in a recess on the outside of the table.

The special work used is bolted directly to plate over the I-beams that cross one another in the construction of the table proper; the centerpiece is made up principally of



LOADING PLATFORM AND CARS READY FOR THE RACE-TRACK CROWD

two castings manufactured by the New York Switch & Crossing Company, of Hoboken, N. J. The latter company advises that these castings are the largest ever sent out from its works.

The rail in the entire layout, consisting of crossing frogs on the table and special work on the outside of the table, is made up of 80-lb. T-rail with bolted rolled guard. The guard near the extreme edge of table is widened at the throat to make it about  $2\frac{1}{2}$  ins. wide.

It will be noted from the general layout that the switches of the trucks on the outside of the table approach the rim very closely. It was impossible to make their radius longer to give them more easement, on account of the necessity of getting as much tangent track as practicable.

To operate the arrangement, it is only necessary, when the table is in place, to run a car directly upon it. The crew of the car remain in their ordinary positions as when on the road. As the crew take a position relative to the bumper block at the head of track, the conductor immediately pulls down his trolley when the signal is given to the man operating the turn-table to revolve it. The table is then turned through 120 degs. The conductor then allows the trolley to return to the wire on outgoing track and gives the go-ahead signal for the motorman.

By actual test this procedure has been accomplished in 20 seconds, and it is expected that with a little practice even this brief time will be greatly reduced to much shorter time, and from trials already made the scheme appears to be very satisfactory.

## HANDLING TRAFFIC AT THE HOT SPRINGS RACES

The limited number of cars owned by the Hot Springs Street Railroad, together with the fact that all those people attending the races want to go to the grounds and return to the city at practically the same time, necessitated the adoption of some unusual methods in handling passengers.

At the race track there is a loading yard 800 ft. long by about 125 ft. wide, enclosed in a picket fence 8 ft. high. At one end is built a loading shed 180 ft. long and 35 ft. wide, and from which several gates give entrance to the grounds. The loading yards contain storage tracks for twenty-five cars. All the cars going to the races are put in special service and no fares are collected on them. Instead, the fares are collected as the passengers go through the gates leading into the grounds. At the termination of the races about twenty-five cars are waiting in the loading yard and fares are collected as passengers pass through the gates. Four cars are drawn up to the loading platform at a time and are started out at close intervals. The method has the great advantage of securing all fares without trouble.

## ACCIDENT FRAUD RUN DOWN IN PENNSYLVANIA BY CENTRAL PENNSYLVANIA TRACTION COMPANY

The Central Pennsylvania Traction Company, of Harrisburg, has caused the arrest of William Wingrove, a trav-



LOADING YARD AND LAY-OVER TRACK AT THE HOT SPRINGS RACE TRACK

eling salesman, at his home in York, on a charge of being a party to a conspiracy to defraud the company out of \$3,200. This sum was the amount of a claim awarded by the Dauphin County Court as the result of injuries alleged to have been sustained by his wife in a fall from one of the cars belonging to the complainant. The arrest followed the arrest of a witness in the case for the prosecution, who is alleged to have made a confession disclosing the conspiracy.

## ELECTRICAL NIGHT AT THE NEW YORK RAILROAD CLUB

The third annual electrical night of the New York Railroad Club was held on March 15 in the Engineering Building. Instead of the usual technical paper, President Vreeland announced that a number of electric traction experts and others had been invited to give ten-minute talks on different phases of heavy electric traction.

The first speaker was W. J. Wilgus, vice-president of the New York Central Railroad. Mr. Wilgus' remarks related largely to the recent wreck of an electric train on the New York Central Railroad near Woodlawn. He felt that the true relation of electric power to this catastrophe should be thoroughly known, especially in view of the gross exaggerations and unjust attacks, both in the daily papers and even in some of the technical publications. He said that too much stress had been laid on the lower center of gravity of the electric locomotive. It might not be amiss, he thought, to call attention to the long and careful series of tests which were made with the locomotives of this type before they were placed in regular passenger operation. The original locomotive was tested for over two and one-half years, during which period it covered over 50,000 miles at high speed in all kinds of service and without a single derailment. The thirty-five locomotives finally ordered for the electric zone service were of the same type and were given extended tests at Schenectady and in the New York zone to prove their acceptability before being placed in regular service. One technical feature which he wanted to bring out in connection with the Woodlawn accident was the ignoring by the District Attorney's expert of the effect of the pony trucks in connection with the shearing of the spikes. In conclusion, Mr. Wilgus took up some of the criticisms made in daily papers with reference to the third rail and the non use of overhead construction. He pointed out that there were three reasons why overhead collection was impracticable in the Park Avenue tunnel, through which all trains must go to reach the Grand Central Station. First, the clearance in the tunnel prohibited the overhead construction. The minimum clearance is 2 ins., since the highest car is 14 ft. 10 ins. high and the total height of the tunnel only 15 ft. from the head of the rail. Second, a legislative act prohibits any additions in the way of overhead construction to the Park Avenue viaduct, and any such construction could be stopped by injunction from abutting property owners. Third, and most important, the city of New York absolutely forbids the use of overhead current collection at high voltages.

Geo. Gibbs, chief engineer of electrical traction of the Pennsylvania, New York & Long Island Railroad, then presented some figures on electric traction with special reference to heavy work. He felt that engineers should not be misled by the enthusiasm of the public for electricity. The electric items that go to make up the equipment of an electrified steam road are half the cost only, the rest being made up of the cost of physical changes in the property. In many cases the electrification of long lines would mean doubling the invested capital, and there were very few railroads that could stand such a burden. The present field of electricity he felt was its application to terminals in very large cities, to tunnels, on heavy grades and in mountain districts where water power is available. "Getting there quickly" was a growing vice. Low maximum speed, he said, is a function of safety, and while the higher average

speed obtained with electric operation in suburban service is an advantage it is due not so much to high maximum speed as to the great saving during the time of acceleration.

Walter C. Kerr, of Westinghouse, Church, Kerr & Company, then gave a brief talk on the conduct of electrification work. He discussed the different methods that the steam railroads could pursue in taking up the electrification of a part of its system, either by contract or by conducting different parts of the work by a special department of the railroad itself or by engaging a firm of engineer-contractors whose personnel and resources would become a part of the railroad company's organization for the time being. His own experience inclined him to favor the last method, particularly as few individual contractors or railroad companies could afford to get together the complex variety of talent needed.

Frank J. Sprague, the next speaker, said that he would go back further into the history of the electric locomotive than Mr. Wilgus. On May 5, 1903, the New York Central Electric Traction Commission issued preliminary specifications covering electric locomotives to ten domestic and foreign manufacturers. Ample latitude was given as to the use of either a. c. or d. c., the only material restriction being that they must be capable of use with multiple-unit control in suburban service. It was also requested that the bidding companies should seek the assistance of experienced steam locomotive designers before submitting bids. The maximum speed for the locomotives was placed at 75 m. p. h., and five months were allowed for the construction of a test machine. Bids were received from only one foreign and two American companies, the General Electric and Westinghouse. The General Electric included in its bid a proposal for single-phase repulsion electric motors, which were not seriously considered, but really recommended direct-current gearless locomotives. The Westinghouse submitted no bid for a. c. motors, a description only of gearless locomotives, and also recommended d. c. locomotives, but of the geared type. After careful consideration the commission unanimously decided upon the gearless d. c. locomotive. The center of gravity of this locomotive is 44 ins. above the rails, higher than any other electric locomotive with the same diameter of driving wheels. The d. c. geared locomotive design submitted was similar in many respects to the half-unit type common to single-phase locomotive propositions except that it had four instead of three pair of drivers. In November, 1903, the contract was placed for a trial locomotive; October, 1904, the first test was made, and since then the locomotive in question had covered between 60,000 and 70,000 miles without a derailment. Referring to the Woodlawn accident, he explained that the third rail had nothing to do with the disaster. It was immediately and automatically cut out of service. He also showed that accidents of this character were by no means confined to electric lines by quoting the reports on some dozen which occurred on steam lines within the last two or three weeks. In conclusion he said that, while the exact cause of the Woodlawn accident was still a question, there were enough possible causes for the catastrophe without off-hand assumptions that it was due to the application of electricity as a motive power, and that the latter was entirely unjustified by the known facts.

The next speaker was Theodore Varney, of the Westinghouse Electric & Manufacturing Company. Mr. Varney spoke on the development of catenary line construction, and said that in general his company adopted 22-ft. clearance. Speaking about the New Haven Railroad construction, he said that the signal bridges over which the catenary cables

are carried on insulated supports are placed 300 ft. apart, but that every 2 miles extra heavy bridges are installed to which the catenary cables are anchored. These bridges also carry the circuit breakers.

W. B. Potter, chief engineer of the railway department of the General Electric Company, then gave a brief talk on the responsibilities that confront the designing engineer in heavy electric traction work. He described the experimental track at Schenectady, where many of the test runs on the New York Central locomotive were made, to give some idea of the care taken to insure the reliable working of apparatus before it was turned over to the buyer. He said he had something interesting to tell the members about the experiment of the General Electric Company with gasoline electric cars. The original car which the company had built was for the Delaware & Hudson River Railroad. It weighed 65 tons and had a gasoline consumption of approximately 1 gal. per mile. The success of the early experiments was such that his company has undertaken the development of a car with a steel body, every detail of which is laid out with reference to the use of gasoline as fuel. This car is still incomplete, but it can be stated that, while the carrying capacity is as great as the first, it will weigh only 30 tons, or less than half of the original car; in fact, the engine and generator of the new car weigh no more than the engine of the first one. The pioneer car was capable of a speed of 30 m. p. h. and occasionally of 40 miles. The new car, with its larger capacity engine and lighter weight, will undoubtedly be able to maintain a speed of 50 m. p. h. and quite possibly 60 miles. By reason of the lighter weight the gasoline consumption will not be much more than  $\frac{1}{2}$  gal. per mile. The car lighting will be accomplished through a storage battery operated from the exciter which controls the generator voltage. As in the former car the speed will be regulated by varying the voltage of the exciter of the generator, which in turn controls the motor. The advantage of electric transmission is that it permits a speed control with infinite gradations. The air brakes will be operated by a direct connection with the cylinder of the gas engine, which will be tapped at a point on the expansion curve, a certain amount of gas being taken out and a check valve introduced to hold this exhaust gas from the cylinders. This is believed to be more efficient than to use an electric compressor, etc.

Samuel Vauclain, of the Baldwin Locomotive Works, expressed the opinion that the driving wheel diameter of an electric locomotive should be as large as a steam locomotive for the same service. Proportioning the driving wheel for speed accomplishes two things: It avoids the annoyance from heating and it raises the center of gravity. At first it was thought by steam locomotive designers that a high center of gravity was a detriment to high speed, but practice developed that this was not the case. He also referred to the motion of a locomotive called nosing. When this action takes place the higher the center of gravity the less effect will there be upon the track. Another feature that tends to the easement of tracks on curves or bad tangents is that the larger proportion of the steam locomotive is supported on springs and has freedom to roll or move independently of the driving wheels themselves. In an electric locomotive the greater percentage of the total load is carried below the springs and upon the trucks. These two features, namely, high center of gravity and spring support, must be taken care of on the electric locomotive just as on the steam locomotive. In his experience with the designers of an electric locomotive he had often suggested that the motors should

be placed in about the same space and position now occupied by the boiler on the steam locomotive, and that the drive should be through a system of rods and levers. This was practicable, as has been demonstrated in the electric locomotives used in the Simplon tunnel. If the arrangement was of this character the number of problems to be settled would be less, for then the experience of steam locomotive designers could be more closely applied to electric locomotive design.

Mr. Wilgus was given the floor again to reply to the points made by Mr. Vauclain. He said that as to nosing, they had had no trouble whatever on curves and only a little at first on tangents. This locomotive had been operated on curves of 2 degs. 17 mins. to 11 and 12 degs., at all kinds of high speeds. During the  $2\frac{1}{2}$  years it ran back and forth over the 2-deg. 17-min. curve it had given no indication of nosing, although Mr. Wilgus said he had personally run the locomotive at 77 miles an hour over the curve, which was elevated for a speed of slightly under 60 miles. The early troubles with nosings on tangent track were no different from what he had had with the regular Atlantic type of steam locomotive, but corrective measures were taken before the final acceptance of the locomotive. An instance of what this electric locomotive could do on curves was shown on the occasion when the locomotive was brought to the New York Central yard hauling eight Pullman cars. In passing into the yard it was necessary to coast 1200 ft. over an unelectricated portion of the track on a  $1\frac{1}{2}$  per cent grade with a reverse curve of  $11\frac{1}{2}$  degs. in one direction and 10 degs. in the other, with two switches and the centers of parallel tracks 14 ft. apart. The locomotive went over this stretch at 30 m. p. h.—very much faster than he would have cared to do with a steam locomotive in the same situation.

Angus Sinclair followed Mr. Wilgus with a few remarks relative to the desirability of electric locomotive designers taking advantage of steam railroad experience. He referred particularly to the change from a low to a high center of gravity.

Mr. Sprague concluded the discussion by saying that there possibly might be changes in electric locomotive design, but that in steam locomotives it was necessary to deal with piston speeds and unbalanced parts. The center of gravity question was not so important in electrical work. There were plenty of cars running in the country with their center of gravity only  $16\frac{1}{2}$  ins. above the rail, yet derailment was very rare indeed. The center of gravity of the New York Central locomotive is 44 ins. above the track, that of the New Haven about 55 ins., and that of a standard passenger steam locomotive 72 ins. to 73 ins. He held that the multiple-unit train with its motors distributed on the trucks was the best ultimate solution for high-speed passenger service.

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#### NORUMBEGA PARK FOR 1907

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During the fall and winter the Norumbega Park Company (controlled by the Boston Suburban Electric Company) has cleared and beautified a large section of its famous park on the river front. This the company has termed "The River Court," and believes it will meet with the hearty approval of all patrons. Aside from this the company is making some slight changes in the general layout of the park, adding a few small features here and there with an idea to beautifying the park still more.

## THE BROADWAY CAR HOUSE OF THE INTERNATIONAL RAILWAY COMPANY

BY THOMAS PUMFREY,  
Engineer, International Railway Company

Although the rolling stock of the International Railway Company, of Buffalo, N. Y., has kept pace with its rapidly growing traffic, the company's car house facilities are still inadequate, despite the fact that a new car house at Cold Spring (a description of which was published in the STREET RAILWAY JOURNAL for July 7, 1906) was completed within the past year. It is not surprising, therefore, that the International Railway Company has found it necessary to erect during this year another car house which will hold 108 cars, each 46 ft. long, with an open storage yard along the south side of the building which will accommodate 135 cars, each 46 ft. long, over which an extension of the car house will be built at some future time. The standard city cars of the International Railway are 46 ft. in length. The total capacity of the new station will be 243 cars.

The new structure will be located on the south side of Broadway, east of Bailey Avenue, in the city of Buffalo. It will be used solely for car storage and ordinary inspection work. As this car house is to form an important division headquarters for the Buffalo lines, it will be provided with offices, and trainmen's rooms for the traffic department; also heating plant, storerooms, oil rooms, etc.

### GENERAL DIMENSIONS AND TRACK ARRANGEMENTS

The property on which this car house will be located has a total length of 698 ft. 4 ins. fronting on Broadway, with a uniform width of 270 ft. 8 ins. running back to Stone Street. This car house is 561 ft. long and has a total width of 148 ft. It is divided longitudinally into two equal bays each 56 ft. wide, with the offices and storerooms, 32 ft. wide, running along the Broadway front. The car house is divided once in its length by steel rolling fire doors, thereby dividing the building into four sections, so that a fire could be confined to any one section. The driveway from Broadway in the center of the building would allow the ready entrance of fire fighting apparatus to all sections of the building.

Cars will enter the house at the east end, pass over the pits, where they will be inspected and cleaned, and then pass to the storage tracks in the west end of the house ready to send out when needed.

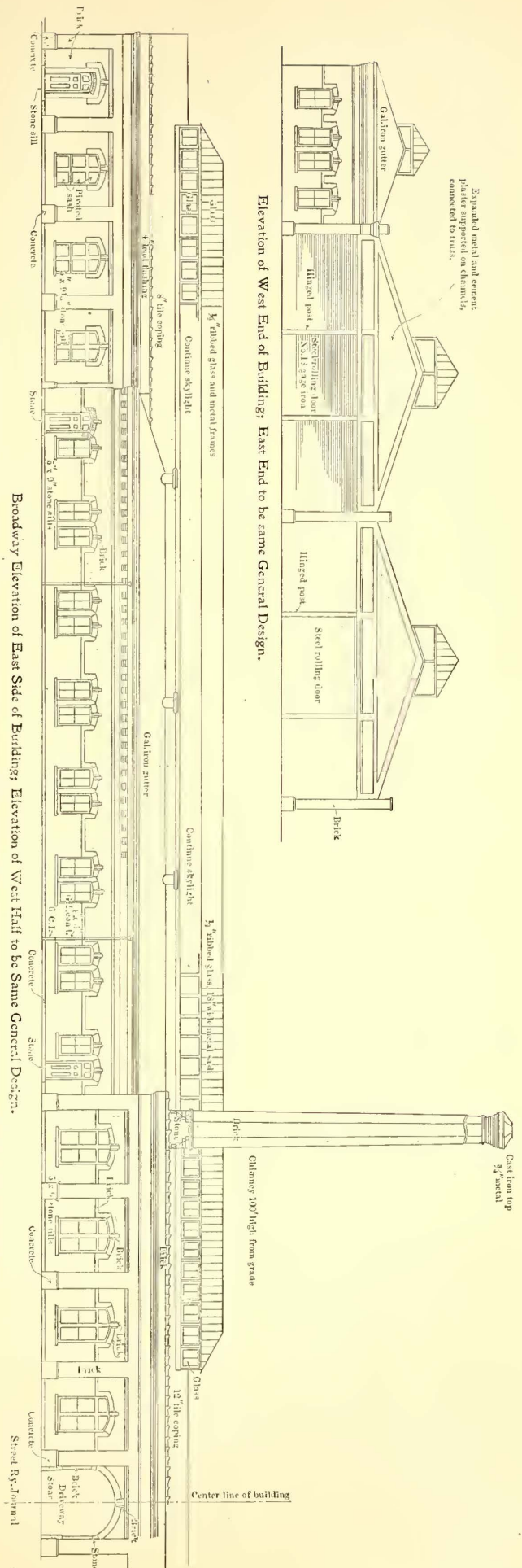
The special work from the street to the property line, also the crossover in Broadway, will all be 9-in. girder work built by the Pennsylvania Steel Company, and will be paved with block stone. All special work on the property will be 60-lb. T-rail guarded, and to be paved with old common stone. The straight rail over the inspection pits will be 9-in. girder rail, Lorain Steel Company's section 94-313. The rail in the west section of the building will be 60-lb. A. S. C. E. T., and that in the storage yard will be old 6-in. girder rail turned backward.

The track throughout the house is level and there is a uniform height of 18 ft. to the bottom of the roof trusses. The track spacing over the pits is 11-ft. centers, that in the west half of building 10-ft. centers, and the storage track in yard 10-ft. 6-in. centers.

### CONSTRUCTION FEATURES OF THE CAR HOUSE

All foundation walls are of concrete projecting 6 ins. above grade. Those in the storage half of building are 4 ft. deep, and in the pit end they are 5 ft. and 9 ft. deep. The pit walls, floors and piers are all concrete; also all floors, except

SIDE AND END ELEVATIONS OF THE BROADWAY CAR HOUSE OF THE INTERNATIONAL RAILWAY COMPANY

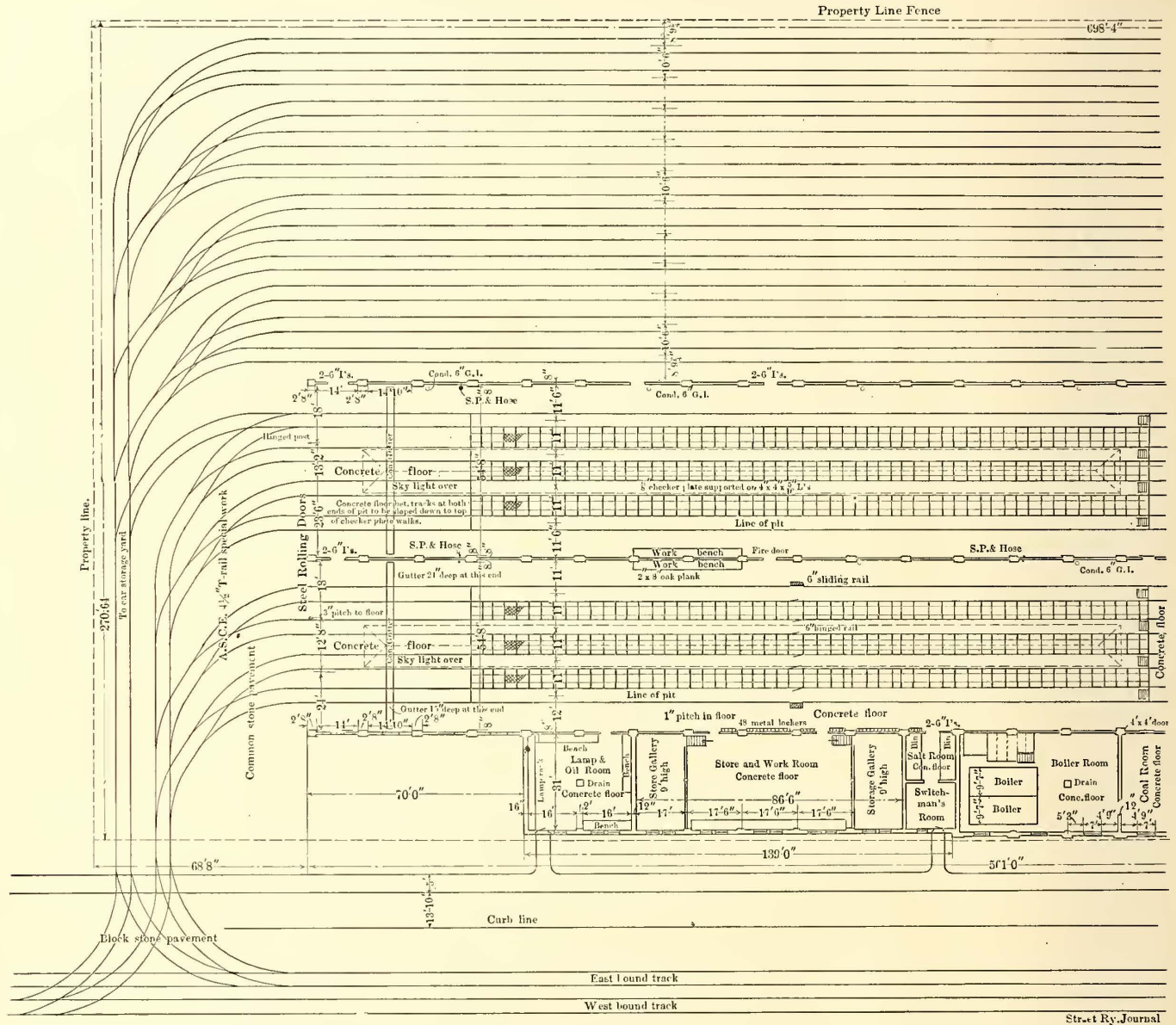


in office and trainmen's room. The office has a 1 1/8-in. maple floor, and the trainmen's room an iron spotted buff brick.

All roof trusses are spaced 17 ft. 6 ins. centers and are carried on brick piers 2 ft. x 2 ft. 8 ins. in size. These piers all have cap stones and two binder blocks 12 ins. thick. The brick wall between the piers is 8 ins. thick and all dividing walls are carried up as fire walls 3 ft. above

light. All sash in sides are pivoted and operated in groups from the side walls near the floor.

Lighting and ventilating car houses by means of a lantern skylight has been found very satisfactory, the car house being well lighted with practically no dark corners. The general lighting of the car house at night is with six 50-cp incandescent lamps placed on the bottom of each truss and controlled from a switch box on the side walls of the



PLAN SHOWING THE TRACK ARRANGEMENT IN THE BROADWAY CAR HOUSE AND STORAGE YARD OF THE INTERNATIONAL TRACTION COMPANY, BUFFALO, N. Y.

the roof and capped with 8-in. glazed tile coping. The brick used in wall and pier construction throughout the building is a first quality red shale.

The roof construction is with 6-in. x 12-in. and 4-in. x 12-in. yellow pine purlins, and 2-in. matched hemlock roof plank with a roofing of five-ply felt and 1/4 in. of actinolite. The gable ends of building, also gables over steel rolling doors in center of building, are filled in with expanded metal and cement plaster 1 in. thick. The lantern skylights on the roof are all made with structural iron frames covered with No. 24 galvanized iron; the glass is 1/4-in. ribbed in sheets 18 ins. wide by the full length of side pitch of sky-

building. All lighting wires are run in metal conduit and lamps hung with condulets.

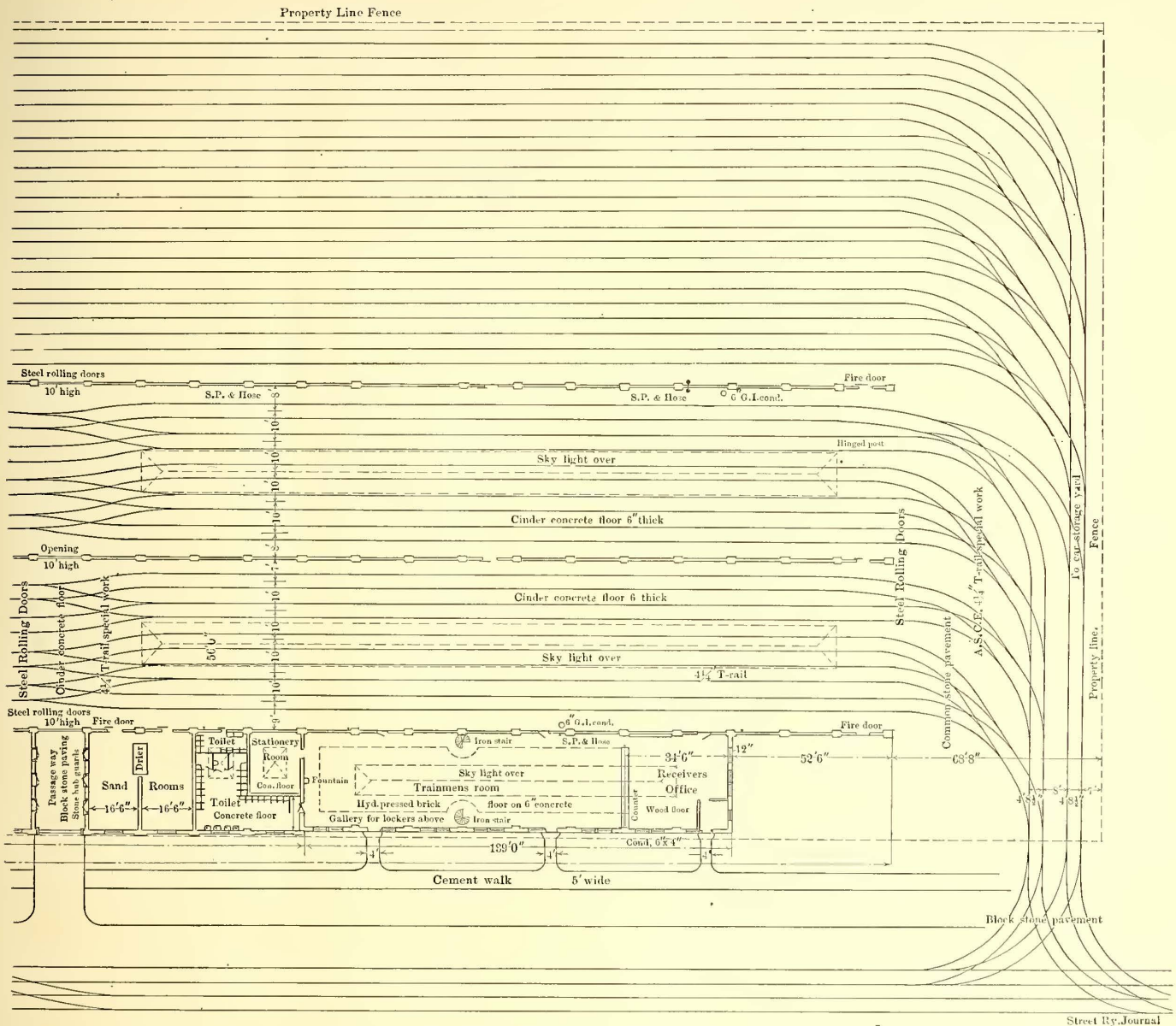
The building is enclosed at each end and divided in the center by steel rolling doors made by Kinnear Manufacturing Company, of Columbus, Ohio. These doors vary in width from 14 ft. to 28 ft. and are 15 ft. high. They are fitted at top with trolley wire hangers which allow the car to enter or leave the building without removing the pole from the wire. Each set of doors across the building at the two ends and in the center are raised and lowered by a 3-hp motor, each door being raised by a friction clutch and a forged link chain.

DRAINAGE AND WATER SUPPLY

All conductors for roof drainage will be standard 6-in. cast-iron pipe fitted at top with copper heads and wire strainers; at the bottom and below floor they will connect with a tile drain running along the foundation wall from each end of the center of building, where they connect into a 15-in. tile drain which empties into the Broadway sewer. This 15-in. tile drain has been kept low enough to take care

The sewer from toilet rooms has a separate connection to the street sewer with a 10-in. cast-iron pipe, the inner end of the 10-in. sewer coming up to the floor of the toilet room and covered with a brass floor plate. The trap outside of the building is placed in a concrete manhole, thus making it very easy to clean the sewer if ever necessary.

The toilet fixtures are more substantial and better ventilated than those usually found in a car house. All fixtures



PLAN SHOWING THE TRACK ARRANGEMENT IN THE BROADWAY CAR HOUSE AND STORAGE YARD OF THE INTERNATIONAL TRACTION COMPANY, BUFFALO, N. Y.—(CONTINUED)

of the pit drainage in any future extension of the building.

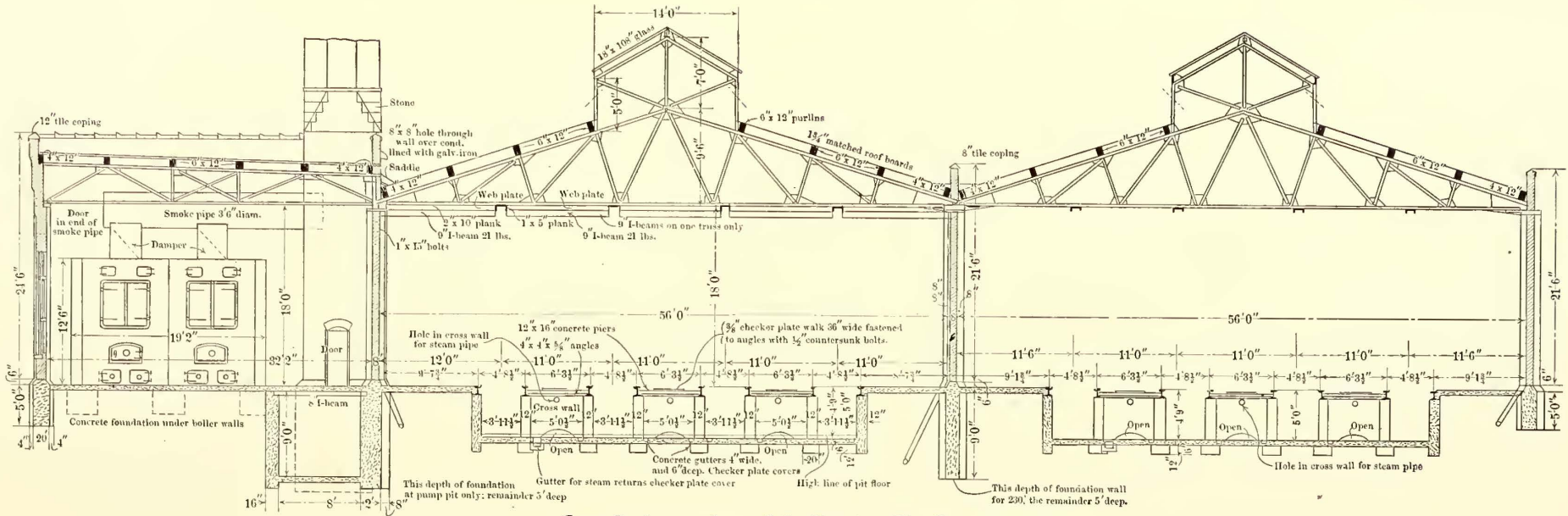
The drainage of the floor of the car house and of the large inspection pits is by grading the floors to a concrete gutter 12 ins. wide across the pits and car house floor. This gutter is connected at one end to the sewer by means of 4-in. iron pipe projecting 4 ins. above the bottom of the gutter, thus allowing all dirt to settle and only the water carried into the drains.

The trench is covered with 1/2-in. perforated wrought-iron plates in long sections. There are small concrete catch basins with wrought-iron covers in the oil room, boiler room, pump pit and toilet rooms. All drains under the inspection pits or office and work rooms are of cast iron.

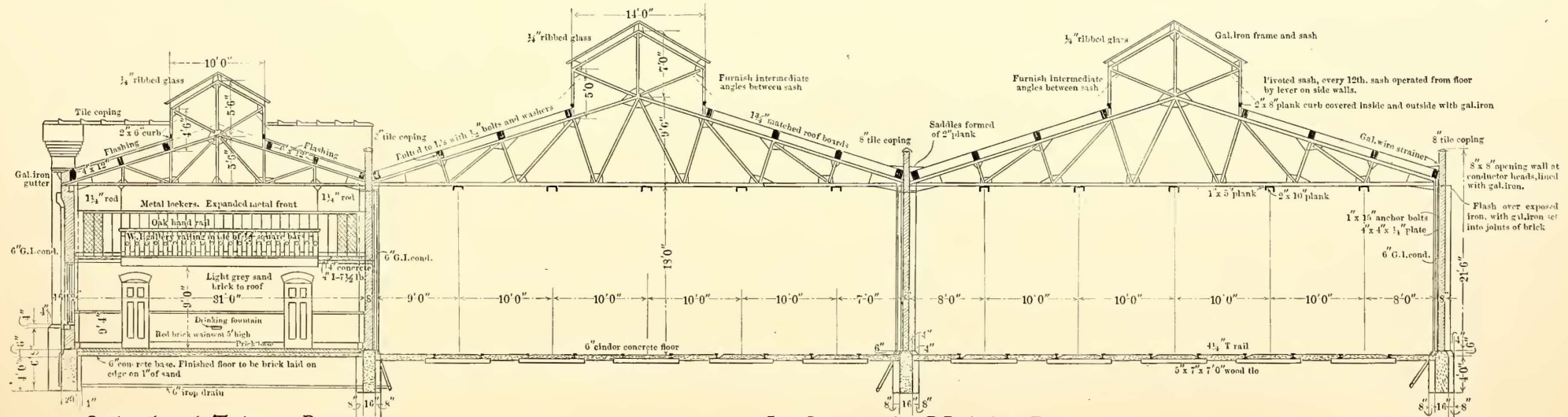
are Mott's Colonial earthenware. The closets have no wooden seats and are set up in three ranges of seven, five and three; each range has a ventilating extension with a 14-in. pipe carried up above the roof and fitted with a globe ventilator. There are two urinals 16 ft. and 8 ft. long respectively. All partitions between closets and urinals are of iron, painted.

There are four separate wash basins, each 18 1/2 ins. x 24 ins., also two blue enameled sinks and one earthenware slop sink. In the east end of the trainmen's room will be placed a porcelain drinking fountain with crystal stream nozzle; with this nozzle it will not be necessary to use cups.

The city water main in Broadway is tapped twice, once



Cross Section on Line C-C. Showing Pit Construction.



Section through Trainmen's Room

Cross-Section on line B-B, looking East

TWO SECTIONS OF THE BROADWAY CAR HOUSE OF THE INTERNATIONAL TRACTION COMPANY, BUFFALO, N. Y., SHOWING TYPE OF CONSTRUCTION, PRINCIPAL DIMENSIONS, ETC.



with a 2-in. pipe for general purposes and with a 4-in. pipe exclusively for fire purposes. The 2-in. pipe takes care of the toilet room, boiler room and car washing. The 4-in. supplies all fire hydrants, of which there are four in each section of the car house, two in trainmen's room, one in boiler room and one in the storeroom.

These standpipes are of 2-in. wrought-iron pipe, galvanized and fitted with Chicago hose valves and 50 ft. of unlined linen hose on an improved hose reel.

PIT CONSTRUCTION

The pits are what is known as open construction, it being possible to pass from under one track to another. They vary in depth from 4 ft. 9 ins. to 5 ft. below top of the rail. The walls are concrete, 12 ins. thick, and the piers concrete, 12 ins. x 16 ins. in size with an extra width for footing of 6 ins. all around.

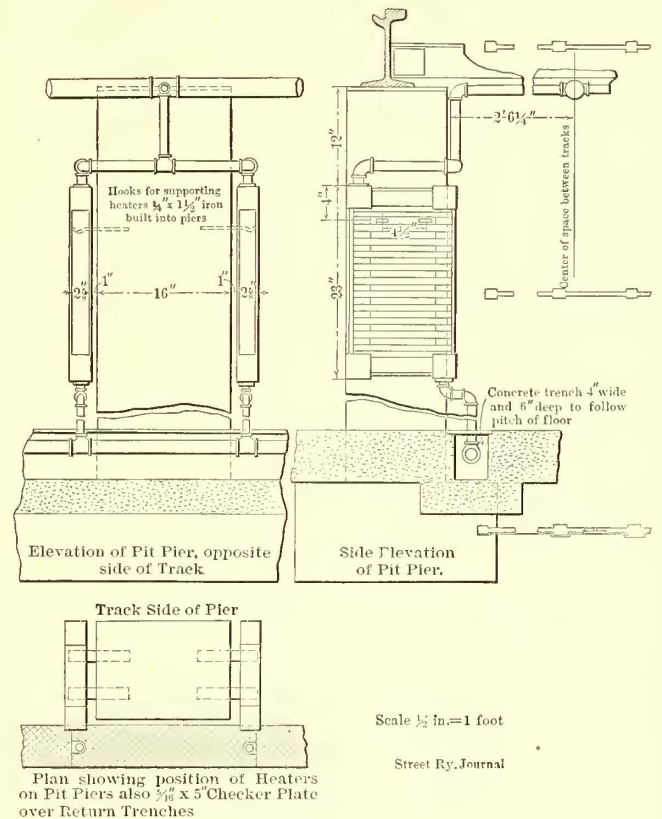
There are placed in these piers anchor bolts for holding the rail down, hooks for supporting the radiators, 3/4-in. conduit for running lighting wires through, and 1/2-in. twisted steel rod in each corner of pier. The rail is supported directly on top of piers, and the walk between tracks is made with 3/8-in. checker plate 36 ins. wide, supported on 4-in. x 4-in. x 5-16-in. angles attached to the rail, the walk being 4 ins. below top of rail.

The pits are heated by placing on two sides of each pier a Colonial wall radiator of 7 sq. ft. heating surface; these are supplied by steam mains carried under the checker plate walk. The return pipes carrying condensation from the heaters are placed in 4-in. x 6-in. concrete trenches at the back of the piers. These trenches are covered with 1/4-in. checker plate.

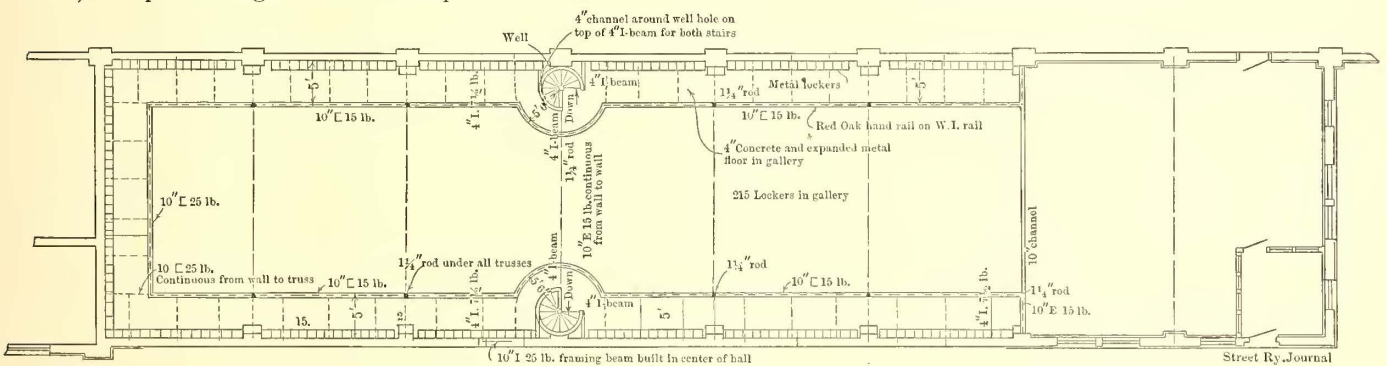
The lighting of the pits is secured by placing a 16-cp lamp on two sides of pier above the heaters and below the rail base. All wires are lead-covered, run in 3/4-in. conduit through piers to cast-iron junction boxes in the floor at various points where they connect and then run to switch boxes on brick wall of car house above the main floor. Access to the pits is by steps at each end of each track made with 1/2-in. plate stringers and checker-plate treads.

HEATING PLANT

Steam for heating the pits, offices and work rooms and for drying sand is supplied from a boiler plant consisting of two 120-hp boilers which can be used separately or together, as the severity of the weather demands. All condensation is returned to the boilers by two pumps located in a pump room 9 ft. below the boiler room floor; fresh water is also supplied to the boilers through these pumps. A brick chimney for the boilers is conveniently located, being octagon in shape, 3 ft. 6 ins. diameter and 100 ft. high,



DETAIL OF PIT HEATERS



PLAN OF MEZZANINE FLOOR OR LOCKER GALLERY IN THE BROADWAY CAR HOUSE

Water supply for car washing over pits is arranged for by placing five 3/4-in. hose connections across each end of pit and across the center brought up alongside the piers to the top of the rail.

About the center of each pit will be placed 6-in. hinged rails in each track to allow the ready removal of wheels, armatures, etc., these being lowered by using telescopic hydraulic motor lifts. Directly over these hinged sections of track a 1 1/2-in. ton electric hoist will operate on the bottom of a roof truss which has been reinforced for carrying the extra load. This hoist will be used to carry heavy material to any track on which cars are being repaired.

partly lined with fire brick and fitted outside with ladder, cast-iron cap and lightning conductor. The coal is delivered by team or car to the coal room located directly in front of the boilers. The steam mains for the trainmen's room, etc., are suspended from the bottom of the roof trusses and insulated therefrom.

STOREROOM

A storeroom 32 ft. x 86 ft. in size has been conveniently located to the inspection pits and will be used for a work-room and storage for repair material.

There are also two galleries, one at each end of the room, used for storing sash, stops and other materials which are

used on the cars only in winter. These galleries are reached by an iron stairway. There are also placed near this room forty-eight metal lockers made by Merritt & Company, of Philadelphia, which will be used by the repair men. A small direct-driven lathe will be placed in this room for the truing of armature, axles, etc.

The oil room has been placed near the east end of the building on the Broadway front and is thoroughly fire-proofed. It is to be fitted with metal lamp racks and barrel stands; also a testing apparatus for electric headlights.

Sand will be delivered either by car or team to the wet sand room located near the center of the building, and dried by a steam coil drier made of about 2000 ft. of 1-in. pipe run at boiler pressure, the dry sand being stored in a room provided for that purpose where shown. This drier will be taken care of by the fireman who tends the boilers.

#### OFFICERS' AND TRAINMEN'S QUARTERS

As this car house will form an important division headquarters, accommodation has been provided for a division superintendent's, receiver's and trainmen's quarters. The division superintendent's office is 10 ft. x 10 ft. in size, located in one corner of the receivers' office, where all cars leaving or entering the house or operating on Broadway can be watched. The receiver's office is 31 ft. x 34 ft. in size.

The partition dividing the receiver's office and trainmen's room is built of brick under the counter. This counter is of white Carrara glass, 3 ft. wide x 27 ft. long and 2 ins. thick. Above the counter a wrought-iron grille is placed having a total height of 9 ft. above the floor. Under the counter are placed money drawers, stationery cupboards, etc. A large cabinet for the storage of one week's supply of transfers is conveniently placed along the south wall of this office, the main supply of transfers and stationery being kept in a room provided for that purpose at the east end of the trainmen's room. The floor of the receiver's office is of 1¼-in. maple laid on sleepers imbedded in a sub-floor of concrete.

The trainmen's room, 31 ft. x 105 ft. in size, and the locker galleries around this room are placed where all parts can be seen from the office. The floor of this room is made with an iron spotted buff colored brick laid in sand on a sub-floor of concrete. The walls have a wainscot of dark red pressed brick with a repressed gray brick above this to the roof. A lantern skylight over the center of this room will provide plenty of light and ventilation; there are also windows along the Broadway front. The underside of the roof plank will be painted three coats of white oil paint.

The locker gallery around this room is of iron and concrete construction, reached by two spiral stairways, one on each side of the room. This gallery is provided with 215 metal lockers, 12 ins. x 12 ins. square and 60 ins. high. They are all numbered consecutively and have Yale & Towne locks master-keyed.

These rooms will be heated with floor radiators 26 ins. high placed under the windows, supplied from a steam main under the roof trusses, with return pipes under the brick floor in split tile. General lighting will be by placing 50-cp lamps on bottom of roof trusses and also around under side of the locker gallery. There will be pool tables, card tables, writing and reading tables, seats, etc., in the trainmen's quarters.

All windows, except the division superintendent's office, are glazed with obscure glass, and the windows of the office are covered outside with iron grilles.

#### GENERAL

All of the above work was designed and the erection will

be in charge of the writer, who is engineer of the company, under the direction of T. W. Wilson, general manager of the International Railway Company.

### ILLINOIS RAILROAD REPORT

Although it will be some little time before the completed report of the Illinois Railroad & Warehouse Commission for the year ended June 30, 1906, is ready for distribution, the introduction to the report has been made available through the courtesy of the secretary of the commission, William Fitzpatrick. The work of the commission as concerns the electric roads covers only the elevated and inter-urban roads and does not include street railways, which were specifically exempted by law. In the opinion of the commission, however, the surface and elevated electric railways are getting to be such a very important factor in the transportation problem of the State that all the steam railroad statutes should apply to the electric railways.

The total mileage, main line and branches of surface and elevated electric railways for the year was 935.76 miles, which is an increase for the year of 173.07 miles. The total mileage of second, third and additional main track was 190.70 miles, being an increase of 12.55 miles over the previous year. Mileage of yard tracks and sidings, 56.84 miles, an increase of 19.01 miles. The total mileage of all kinds of tracks is 1187.43 miles, being an increase of 204.63 miles over the previous year.

The capital stock and funded debt of this class of roads was \$160,587,228. This is an increase of \$7,664,609, accounted for by the increased mileage put in operation. The average capitalization per mile of road of surface and elevated electric railways was \$171,782. The average capitalization per mile of surface roads was \$75,868. The average capitalization per mile for elevated roads was \$2,035,289. The total income from the operation of surface and elevated electric railways was \$12,280,192, an increase over the previous year of \$1,925,633. The total dividends paid were \$742,969, an increase over the previous year of \$112,595. The total assets and liabilities were: Assets, \$173,724,598, an increase of \$7,258,189 for the year. Liabilities, \$169,726,314, an increase for the year of \$6,113,907, showing a net surplus of assets over liabilities of \$3,998,284.

The total amount of income from passenger service, including mail, express, advertising, etc., was \$11,016,920, an increase of \$1,587,790 over the previous year. The total amount of income from freight service was \$446,320, an increase of \$82,732 over the previous year. The total earnings and income from all sources was \$12,805,420, an increase over the previous year of \$2,050,539.

The total expenditures for maintenance of way and structures, maintenance of equipment, conducting transportation and general unclassified expenses and fixed charges amounted to \$10,900,208, an increase of \$1,111,849.

The number of passengers carried earning revenue was 183,650,979, an increase over the previous year of 21,001,944. The number of tons of freight carried earning revenue was 1,277,566 tons, an increase over the previous year of 641,823 tons. While both the passenger and freight earnings per mile of road were less than the preceding year, the operating expenses per mile of road were less than the preceding year and the net earnings per mile \$74 more.

The number of officers and employees was 6,726, an increase of 1603 over the previous year. There was paid in salaries to these employees the sum of \$3,965,761.53, an in-

crease over the previous year of \$622,399.39. A table containing a classification of the officers and employees, with the average daily compensation for each class, shows the total daily average for all classes was \$2.12, an increase of 0.04 cents per day over the previous year.

During the year 4117 tons of steel rails and 80,755 new ties were laid. There are 351 stations on the roads, an increase of 34 over the previous year. The number of highways crossed at grade is 2146, an increase of 96 over the previous year. The number of under highway crossings is 458 and the number of overhead highway crossings is 7. The number of electric railways crossed at grade is 54, an increase of 11. The number of steam railroads crossed at grade is 123, an increase of 5. The number of overhead crossings of steam railroads, 40. The number of overhead electric railway crossings, 12. Total overhead crossings, 52. The increase of mileage of ballast, such as gravel, stone, cinders, etc., shows a disposition to place the properties in the best condition for careful handling of the business. These lines have 10 bridges of masonry, 15 of iron, 97 of steel, 4 of wood and 2 combination, with an aggregate length of 15,499 ft. The number of passengers killed was 7, and employees 10; other persons, 31, an increase of 12. The total number of passengers injured was 306, a decrease of 29; employees injured, 97, an increase of 20; other persons, 65, a decrease of 14. The total number killed, all classes 48, an increase over the previous year of 19. Total number injured, 468, a decrease of 23 from the previous year.

The accident reports for steam railroads show that one passenger was killed for every 1,659,314 passengers carried, and that one passenger was injured for every 96,744 passengers carried. The accident reports for steam railroads also show that one employee was killed in every 359 employed, and one employee was injured in every 29 employed. The accident reports for surface and elevated electric lines show that one passenger was killed for every 26,235,854 passengers carried, and one passenger was injured in each 600,166 passengers carried; and that one employee was killed in every 672 and one injured in every 69 employed.

The following is a comparison of the capitalization of surface and elevated electric railway companies representing the entire mileage of such companies as report to this commission, ending June 30, 1905 and 1906, respectively:

YEAR.	Capital Stock.	Funded Debt.	Total.
1905.....	\$77,765,600	\$75,157,019	\$152,922,619
1906.....	78,539,500	82,047,728	160,587,228
Total increase.....	\$773,900	\$6,890,709	\$7,664,609

The following is a comparison of capitalization per mile of road ending June 30, 1905 and 1906, respectively:

CLASSIFICATION.	1905.	1906.
Average amount of capital stock per mile of surface roads ..	\$41,010	\$34,917
Average amount of funded debt per mile of surface roads ..	.....	40,951
Total.....	.....	\$75,868
Average amount of capital stock per mile of elevated roads.	\$1,061,133	\$1,037,933
Average amount of funded debt per mile of elevated roads..	991,734	997,356
Total.....	\$2,052,867	\$2,035,289
Average amount of capital stock per mile—surface and elevated roads.....	\$99,335	\$84,014
Average amount of funded debt per mile—surface and elevated roads.....	96,003	87,768
Total.....	\$195,338	\$171,782

The following statistics are gathered from the income

account table, and a comparison is made with the fiscal years as of June 30, 1905 and 1906, respectively:

CLASSIFICATION.	1905.	1906.
Gross earnings from operation.....	\$10,354,559	\$12,280,192
Operating expenses.....	5,758,623	6,573,261
Income from operation.....	4,595,936	5,706,931
Income from property and other sources.....	472,883	682,845
Total income.....	5,068,819	6,389,776
Expenses assignable to fixed charges.....	4,097,925	4,423,277
Net income.....	970,894	1,966,499

The following is a comparative statement of assets and liabilities for the years ending June 30, 1905 and 1906:

	1905.	1906.	Increase.
Total amount of assets.....	\$166,466,409	\$173,724,598	\$7,258,189
Total amount of liabilities.....	163,612,407	169,726,314	6,113,907
Net surplus.....	\$2,854,002	\$3,998,284	.....

COMPARATIVE SUMMARY OF EARNINGS AND INCOME

CLASSIFICATION.	1905.	1906.
Passenger service:		
Passenger revenue.....	\$9,269,135	\$10,811,182
Mail.....	3,301	3,608
Express and package freight.....	80,692	41,743
Advertising in cars.....	.....	135,480
Total, including miscellaneous.....	\$9,429,130	\$11,016,920
Freight service:		
Freight revenue.....	363,588	446,320
Total freight earnings, including miscellaneous.....	\$363,588	\$446,320
Other earnings from operation:		
Sale of light, heat and power.....	.....	52,116
Advertising (not in cars).....	.....	79,872
Total, including miscellaneous.....	\$489,307	\$659,421
Total earnings from operation.....	\$10,282,025	\$12,122,661
Income from property owned.....	472,856	682,759
Total earnings and income.....	\$10,754,881	\$12,805,420
Increase for the year ending June 30, 1906.....	.....	2,050,539

TABLE VI.—COMPARATIVE SUMMARY OF EXPENDITURES—ILLINOIS.

CLASSIFICATION.	1905.	1906.
Maintenance:		
Way and structures.....	\$498,588	\$564,470
Equipment.....	749,801	921,832
Transportation:		
Operation of power plant.....	1,231,870	1,359,872
Operation of cars.....	2,217,876	2,377,785
General expenses.....	994,991	1,255,219
Unclassified expenses.....	15,091	29,752
Total operating expenses.....	\$5,708,217	\$6,508,930
Total fixed charges.....	4,080,142	4,391,278
Total operating expenses and fixed charges.....	\$9,788,359	\$10,900,208

SUMMARY OF TRAFFIC STATISTICS FOR YEARS ENDING JUNE 30, 1905 AND 1906

CLASSIFICATION.	1905.	1906.
Passenger traffic:		
Passengers carried earning revenue.....	162,549,035	183,650,979
Passenger and mixed car mileage.....	.....	51,849,607
Average receipts per passenger per mile.....	.....	.....
Passenger earnings per car mile.....	.....	\$0.212
Average amount received from each passenger.....	\$0.057	\$0.059
Passenger earnings per mile of road.....	\$12,030.00	\$11,771.00
Transfer passengers carried.....	3,383,124	6,397,108
Freight traffic:		
Tons of freight carried earning revenue.....	635,743	1,277,566
Freight and mixed car mileage.....	.....	689,950
Average receipts per ton per mile.....	.....	\$0.048
Freight earnings per car mile.....	.....	\$0.656
Average amount received from each ton of freight.....	\$0.540	\$0.350
Freight earnings per mile of road.....	\$1,144.00	\$751.00

The following shows a comparison of the average daily compensation paid to all employees in Illinois during the fiscal years of June 30, 1905 and 1906, respectively:

CLASSIFICATION.	RATES.	
	1905.	1906.
General officers.....	597	777
Other officers.....	471	521
General office clerks.....	185	192
Train clerks and dispatchers.....	236	257
Station agents.....	151	163
Other station men.....	206	211
Conductors and yard foremen.....	178	248
Other trainmen and switchmen.....	529	180
Guards.....	229	233
Motormen.....	214	189
Starters.....	172	194
Switch tenders, crossing tenders and watchmen.....	173	179
Roadmen.....	163	172
Hostlers.....	190	204
Linemen.....	326	340
Engineers.....	197	191
Firemen.....	193	192
Other power house employees.....	249	246
Electricians.....	223	227
Machinists and mechanics.....	165	163
All other employees and laborers.....		
Average rate per day for all employees, excluding officers.	\$1.98	\$2.03
Average rate per day for all employees, including officers.	2.08	2.12

## CORRESPONDENCE

### NOTES ON SPEED-TIME CURVES

CHICAGO, March 8, 1907.

Editors STREET RAILWAY JOURNAL:

I am much interested in Mr. Mailloux's discussion of my article, "Notes on Speed Time Curves," in your issue of March 2, 1907, page 390.

Mr. Mailloux states that several of the supposedly new features of my method of plotting speed-time curves had been used by him in his early work and were discarded for better ones. Up to the time of reading Mr. Mailloux's letter, I was not aware that any one had plotted these curves using just the procedure as indicated in my article; and I think there was nothing in available technical literature to so indicate. Unfortunately, the notes in Mr. Mailloux's excellent lectures at various technical schools were not available. My attention has now been called to them for the first time.

The whole theory underlying speed time curve plotting is so extremely simple that it seems unnecessary to burden either the theory or the method of application with any great amount of refinement. Refinement in stating the theory by means of calculus notation, for instance, is of no value unless some equation can be fitted to one or more of the various curves. As this is admittedly a point-to-point method, it is out of place and undoubtedly confusing to some. Refinements in method, such as Mr. Mailloux's "Chart of Reciprocals," only lead to greater accuracy than the slide rule method of solving the general equation. Here again exactness is unnecessary, in addition to making the method somewhat more cumbersome and not of as general application as the slide rule method, as I shall presently endeavor to show. The closeness with which a plotted speed time curve indicates the exact conditions of an equipment in service is dependent primarily upon the accuracy of the train friction curve. Even after considerable study, the proper train friction curve can not be estimated to within 3 or 5 per cent. What is the use, then, of adopting a refinement that would perhaps add 1 per cent to the accuracy, when the original assumptions are liable to be 3 or 5 per cent in error? These considerations led me to use the method as outlined in my article in your issue of Feb. 9, 1907.

Regarding Mr. Mailloux's chart method: He states that

the same "chart of reciprocals" can be used again and again, provided the same scale of "acceleration coefficients" is used on both the "chart of reciprocals" and the "chart of coefficients." This last was my chief objection to it. In order to have the same ordinate scale of "acceleration coefficients" on the "chart of coefficients" for all cases, it is necessary to consider the weight of the car in plotting each curve of "coefficients." This obviates any attempt to have a "chart of coefficients" of perfectly general application, applying to different weights per motor, plotted on one sheet.

For instance, in my Fig. 1, according to Mr. Mailloux, a simple division of the scale of ordinates by 91.1 would give acceleration coefficients that could then be used on his "chart of reciprocals" and the speed-time curve plotted therefrom. This is not true, because the scale of ordinates is pounds per motor instead of pounds per ton. If I had used the term pounds per ton, Fig. 1 could not be said to be "General."

This is apparent from another view point. If I should convert the scale of ordinates of Fig. 1 to "acceleration coefficients" by first changing to pounds per ton and then dividing by 91.1, it is apparent that the curves as they stand would be for only one value of tons per motor. This is an absurd condition, because obviously a gear ratio of 4.00 would not be used with the same tons per motor as would a gear ratio of 1.42. The curves would be valueless. Even admitting that the same tons per motor would be used, the acceleration with the 4.00 gear ratio would prove to be so large a quantity (3.1 at starting) that it would be beyond practice or beyond the range of the "chart of reciprocals."

Mr. Mailloux has apparently confused the term "pounds per motor," which gives the curve (Fig. 1) a broad general application, with "pounds per ton," which necessitates a definite weight of car being considered. Any use of the terms "equivalent acceleration" or "acceleration coefficient" on the curves prohibits their application to anything but the specific case where the pounds per motor correspond to the pounds per motor for which the curves were originally plotted. This will indicate why I believe the chart method is not so generally applicable as might be presumed from Mr. Mailloux's discussion. The "chart of reciprocals" in itself is valuable, but it necessitates a special "chart of coefficients" being plotted for each gear ratio and each weight per motor.

The "general speed tractive effort" curves in my possession are blue prints consisting of diagrams similar to Fig. 1, without the friction curve. The friction curve is drawn in red ink for each particular case considered, making a very flexible arrangement. As to the novelty of styling the ordinate scale of Fig. 1 as pounds per motor, permit me to say this same notation was used by F. W. Carter and also by J. C. Huffman, "Effect of Changing Gear-Ratio on a Series Railway Motor Equipment," STREET RAILWAY JOURNAL, Oct. 29, 1904, and probably by others. I can not therefore ask any one to consider it a "novel feature," nor had I supposed any one would so consider it. The novel feature of the curve (Fig. 1), however, consisted in placing of the ampere curves upon the network.

Mr. Mailloux further states, regarding the inertia of rotating parts: "With the slide rule either one more setting is required or else an addition has to be made separately before using the rule, as indicated by the sum ( $W + W_i$ ) in Mr. Simpson's equation." The implication seems to be that this addition must be made before each determination of a time value with the rule. The term ( $W + W_i$ ) is a

constant for any particular equipment. The addition has to be made only once and it is determined for all time.

I am personally aware of one case where speed-time curves of 200 miles of runs for a proposed Western interurban road were plotted exactly in the manner as shown in my article. The entire job, including all preliminary curves, except the "general speed tractive-effort" curve, already at hand, was completed in about six days.

I have no means of knowing whether faster work could have been done with the chart method, for I plead guilty as being in the class with those who have "never tried the chart method"—on account of having to plot a new "chart of coefficients" for each particular case of weight per motor as well as gear ratio in order to be able to use one "chart of reciprocals." Undoubtedly the chart method would be more accurate, but considering the probable errors of assumption, such accuracy seems unnecessary. TRACY W. SIMPSON.

### LARGE CONTRACT FOR AIR BRAKE EQUIPMENTS

The Allis-Chalmers Company, of Milwaukee, announces that it has just secured contract for supplying all of the air brake equipments required for all electric railways operated or controlled by the New York, New Haven & Hartford Railroad Company. This is said to be the most extensive air brake contract ever placed.

The number of cars in service at the present time aggregates on the different lines a total of about four thousand. Approximately fourteen hundred of the heavier cars are already equipped with air brakes of various types. Over a thousand of these are of the Christensen type, now manufactured by Allis-Chalmers Company.

As a matter of railway history, the first Christensen air brake equipment placed in service in New England was installed, in 1898, on a car of the Hartford Street Railway Company, now a part of the above referred to system. After nine years of continuous service this identical equipment is still in daily use.

### IMPROVEMENT IN STORAGE BATTERY CONSTRUCTION

Joseph Bijur, of the General Storage Battery Company, has recently patented a valuable improvement in the method of manufacturing negative plates for storage batteries. The method has been in use by this company for a year or so, but the details have just been made public through the issue of the patent. The invention is designed to prevent loss of capacity in the plates through the solidification of the porous sponge of the lead into a metallic mass, and secure permanent passageways for the diffusion of the electrolyte. It is equally applicable to Planté plates or pasted plates.

Briefly, the invention consists in soaking a plate, which has been made in the usual manner, in a solution of sugar, which penetrates the pores of the plate readily. The strength of the solution used can be from 2 to 30 per cent. The plate is then rinsed to free it from any of the solution which may be on its surface, is then dried, and finally baked at a temperature of from 475 to 575 degs. F., until the sugar is completely carbonized. This may take from 5 to 10 minutes. If the plate has an alloy frame which melts at a lower temperature than the remainder of the plate, these parts can be protected during the heating. The plate is again rinsed to remove any particles of the sugar that are not converted to carbon in the heating process. It is then ready for use. Pasted plates can be treated in largely the same way.

It is claimed that the process makes the plate much stronger and hardy and prevents it from becoming sulphated.

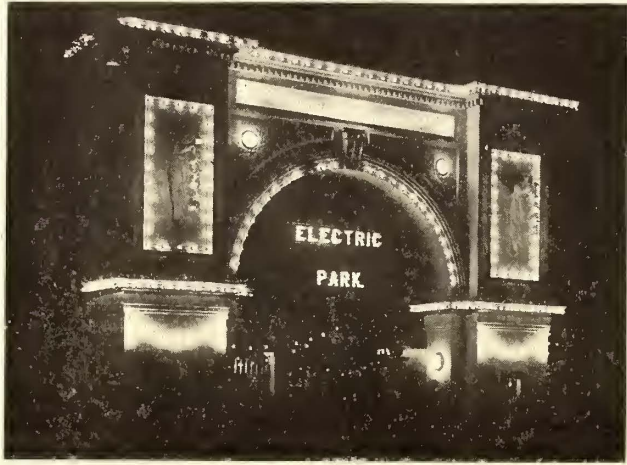
### EQUIPMENT DATA OF NEW CARS FOR THE BROOKLYN RAPID TRANSIT COMPANY

The Brooklyn Rapid Transit Company has placed orders for one hundred elevated cars, fifty of which will be built by the Laconia Car Company and fifty by the Jewett Car Company for delivery during October, December and November, 1907. The following data have been furnished in connection with these cars by Wm. G. Gove, superintendent of equipment: Semi-convertible car, seating 54; weight, 69,000 lbs. approximately; length of body, 40 ft. 5 ins.; length over all, 48 ft. 11 ins.; width inside, 7 ft. 6 ins. between posts; width over all, 8 ft. 7 ins.; height inside, 8 ft. 3 $\frac{5}{8}$  ins.; sill to trolley base, 9 ft. 4 $\frac{1}{2}$  ins.; height, track to trolley base, 12 ft. 6 $\frac{1}{2}$  ins.; body, wood or metal-wood, with steel in corner and double posts; underframe, pressed steel. The special equipment consists of the following: Axles, trail truck 5 $\frac{1}{4}$  ins. wheel seat and motor truck not yet decided upon; body bolsters of pressed steel; steel plate truss bolster for trail truck, but motor truck not yet decided on; brake-shoes of cast iron; center bearings of cast steel; multiple-unit control system; Van Dorn automatic couplers; curtain fixtures, Curtain Supply Company; curtain material, Pantasote; destination signs, flat signs hung on railings; door fastenings, Coburn tracks and sheaves; dust guards, wood; fenders, none; gears and pinions, steel; gongs, Brooklyn Heights standard; hand brakes, Brooklyn Heights standard; heating system, Consolidated panel electric heaters; arc headlights, "Eureka"; interior finish, cherry natural, white ceiling; journal bearings, trailer 4 $\frac{1}{4}$  ins. x 8 ins., motor 5 ins. x 9 ins.; journal boxes, M. C. B.; markers, Dresser; motors, not yet decided; roofs, monitor type; safety tread, Universal; sanders, none; seats, Hale & Kilburn; side bearings, cast steel; springs, elliptic and helical; trolley poles and attachments, 11-ft. 3-in. reinforced steel trolley pole with Nuttall stand; trucks, M. C. B.; ventilators, monitor sash; vestibule, none. In addition one hundred surface passenger cars were ordered in February from the J. G. Brill Company for construction at the Stephenson Works. These are of the semi-convertible type. Their seating capacity is 38; weight, 33,000 lbs.; wheel base, 19 ft. 5 $\frac{3}{4}$  ins.; length of body, 28 ft., and over vestibule, 37 ft. 2 ins.; length over all, 38 ft. 3 $\frac{3}{4}$  ins.; width inside, 7 ft.  $\frac{1}{2}$  ins., and over all, 8 ft.  $\frac{1}{2}$  in.; height inside, 8 ft.  $\frac{3}{8}$  in.; height of track to trolley base, 8 ft. 11 $\frac{3}{4}$  ins.; body, wood; underframe, wood. The special equipment consists of axles, driving 4 ins., pony 3 $\frac{1}{2}$  ins.; bar-steel body bolsters; cast-steel center bearings; curtain fixtures, Acme open car cable; curtain materials, Pantasote; destination signs, Brooklyn Heights illuminated four-side block sign; dust guards, wood; fenders, Empire; gears and pinions, steel; gongs, Brill Dedenda; hand brakes, Brooklyn Heights standard with St. Louis 14-in. handle; heating system, Consolidated Car Heating Company; headlights, Dayton incandescent; interior finish, cherry natural; motors, not decided; roofs, monitor; safety tread, Universal; sanders, Silver & Company's "Reliable"; seats, Heyward Brothers & Wakefield Company rattan covered; side bearings, cast steel; trolley poles and attachments, Brooklyn Heights standard; trucks, Standard Motor Truck Company, maximum traction type; ventilators, monitor sash, and a built-in vestibule with open sides.

## PARK MANAGEMENT AND ATTRACTIONS

### THE FINANCIAL SIDE OF PARK OPERATION

So much has been written about securing profitable park attractions that it may not be amiss now to turn attention to the means necessary to secure for the operating company every cent taken in at the gate and other points under its control. Railway men are accustomed to the peculations



ELECTRIC PARK AT NIGHT

of conductors and take every possible precaution to prevent them, but naturally they are less familiar with the amusement business and therefore more subject to imposition.

The collection of all the money paid to see the different attractions is indeed a very serious problem. As the park season is so short, it is difficult to secure reliable employees. Many of them are of a more or less nomadic character, only staying at their posts while they see a chance to make "big money." The nature of their employment, of course, makes it impracticable to pay them large salaries, yet they are subject to the temptation of handling large amounts of other people's money.

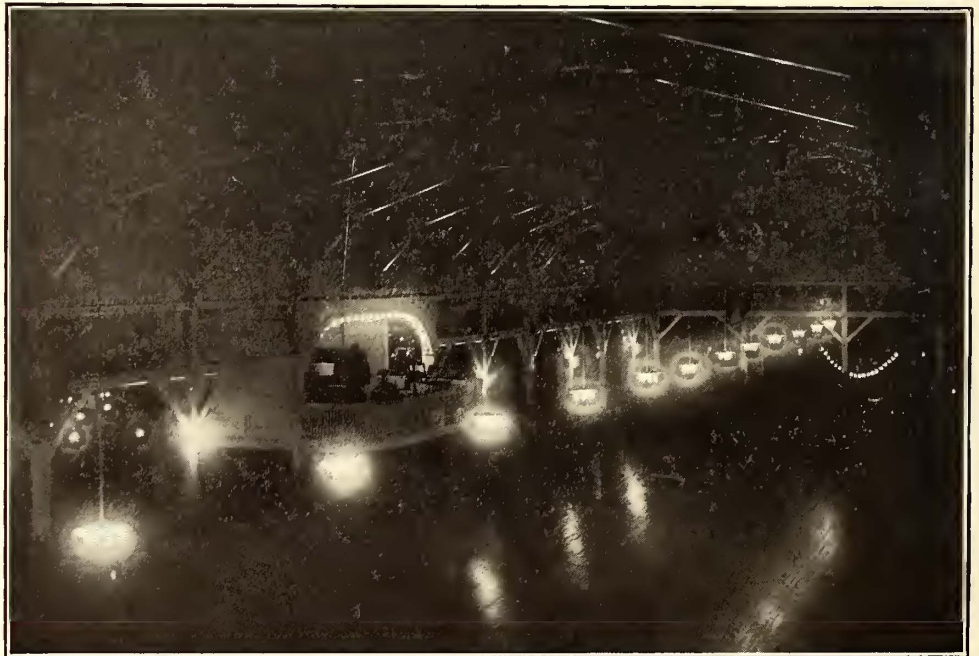
Since it is plain, then, that the finances of a park must be looked after with even more care than a regular business, it may be of value to other amusement managers to explain the collection methods in vogue at Electric Park, Newark, N. J. This park is chosen for illustration because it is an excellent example of a thoroughly successful resort due to the popularity of its attractions and the experienced financial management. It is owned by the Electric Park Amusement Company, of which C. A. Dunlap is president and general manager. The park itself is neither a natural woods nor a "White City," but a neatly laid-out grove, shady in the day and well illuminated at night. The principal attractions are the electric fountain, dance hall, theater, roller

coaster, circle swing and merry-go-round—all permanent paying features, together with several smaller shows which are changed every season with little new expenditure for buildings.

The financial end of the business is managed on the principle that honesty cannot be assured unless every temptation is removed. The only way is to make every single department safe in itself with the bookkeeping of such character that if any stealing is to be done it would require the collusion of people in different departments. In the first place, every gate should be protected by a ticket-chopping box. Under no consideration must a gatekeeper be allowed to handle a ticket; if caught, he is discharged at once. Such ticket boxes should be installed in connection with the dance hall, skating rink, theater or any other attraction for which straight tickets are sold. When tickets are issued for reserve seats (as for the theater) they must be torn in any event. It is advisable to change the ticket boxes around during the day, as this action tends to puzzle the choppers and deters them from tampering with the boxes.

In spite of such precautions, there must be some supervision; for instance, the gatekeeper will accept cash to let people who have no tickets enter the grounds unless he knows that some one is watching him. This practice can be stopped if the management should make it a point to send men to the park on different occasions to offer cash to the gatekeeper and see if he takes it. A few discharges for this offense will end such troubles for the season.

When the cashiers of the different attractions and sales stands under the operating company's control arrive in the morning at the office, each receives his proper cash box



THE DANCE HALL IN ELECTRIC PARK, WITH THE ORCHESTRA IN THE CENTER

with a roll of tickets and \$5 to \$10 in change, as may be necessary. They are then prepared to go on duty. At the close of the day, each cashier prepares a statement on the daily report illustrated. The cashier of the circle swing, for instance, counts his money and notes the amount opposite "Cash Received," after which the cash receipts are placed in the cash box with the corresponding tickets and


change. The box is then brought in a canvas bag to the general office. Every bag is lettered according to the department where it is used. The daily report itself is sent to the treasurer, who compares it next day with the report made out by the head cashier. Discrepancies must be accounted for at once, and even if collusion should exist between any of the department cashiers and the one in the office it would not take long to find it out.

The most difficult problem, however, is to keep the liquor bars and the waiters straight, and the only way to solve it

of this sort of trouble for several days, reports to the manager that a certain bar is running behind. The manager then takes the matter up with the head barman, who soon locates the trouble.

Experience appears to indicate that the best way to treat waiters is to pay them on a percentage basis. In Electric Park it is customary to sell \$5 in checks for \$4.25, thus giving the waiters 15 per cent on all sales. If they have any tickets left they keep them for use next day. The waiters

**DAILY REPORT**

..... Register No. .... 

..... Cash Received, \$ .....

..... Checks .....

..... Superintendent .....

..... Cashier .....

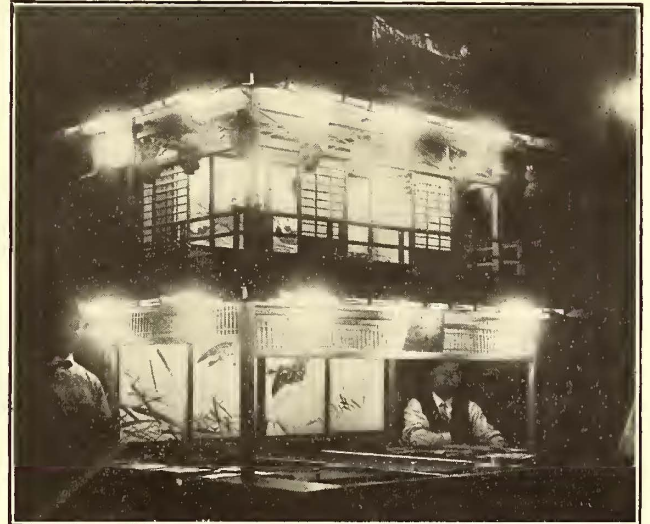
..... Bartender .....

**REMARKS:** .....

**CASHIER'S DAILY REPORT**

is to "work on stock." A head barkeeper or superintendent in whom implicit confidence can be placed should be engaged. At the beginning of the season this man should be given a certain amount of stock, with replenishments as occasion demands, and at the end of the season the stock left must tally with the books.

Each bar should have its own bartender and cashier, the latter getting his little box of change just like the other



JAPANESE BALL GAME—A TYPICAL MINOR ATTRACTION

Bar No. .... 1906

Bottles Bar Whiskey	\$	Amount Brought Forward	\$
" Wilson Whiskey		" Rhine Wine	
" Old Crow Whiskey		" Vermouth	
" Hunter Whiskey		" Creme de Mint	
" Usher Scotch		" Benedictine	
" Tom Gin		" Soda	
" Sloe Gin		" Seltzers	
" Martell Brandy		" Colery Tonic	
" Ginger Brandy		" Bass Ale	
" Apple Jack		" Lyons Ale	
" Blackberry		" Bottle Beer	
" Port Wine		" Lager Beer	
" Sherry Wine		" Champagne	
Manhattan		Cigars	
Marline		Cigars	
Geneva Gin		Cigarettes	

**BAR STOCK RECORD**

cashiers. Every morning the head barman and his assistants make up the stock to go to each bar. After the day is over, all of the unsold stock is returned to the cellar, in which a separate compartment is reserved for each bar. The next morning the barman will take, say, the stock for bar No. 1, spread it out on a table, and from the stock in front of him figure out on a bar stock record what was sold the day before without knowing how much money the cashier of that particular bar had turned in. After this he refills all bottles. The bar stock record is brought to the treasurer, who on comparing it with the cash report turned in separately from the same bar can easily tell that the bar in question either has a poor bartender or that he is getting less money. The treasurer, after noting the continuance

work by the week but seldom draw all their cash before the end of the season. This system is extremely simple, the only labor arising from keeping track of the number of brass checks given to the cashier.

One source of loss which should be avoided relates to delivery of supplies at the park. Most goods are delivered early in the morning, before the arrival of the manager, who usually remains on the grounds until long after midnight. Consequently it is very easy for a dishonest subordinate to agree with the iceman or other teamster to sign a receipt for a larger quantity than he actually receives, the two afterward pocketing the cost of the difference. The same scheme can be worked with other articles, but ice is the easiest, as it is used in large quantities and naturally has diminished considerably by the time the manager arrives, so that detection is difficult. The receiving clerk should be on the ground by 6 or 6:30 in the morning to anticipate all deliveries and count or check all supplies. He should also act as timekeeper to see that the different employees arrive at the proper time.

As the park business is conducted on a cash basis, there is no reason why the books should not always show the exact state of both sides of the ledger. At the end of the season the management should know just what attractions made or lost money, how much was paid on the original investment, how much in improvements, etc. In short, if a park is to earn money, it must be managed along strict business lines.

One other interesting problem in finance that confronts the amusement manager is the attitude he should take toward new attractions whose purchase would require large initial investments. As it is almost impossible to foretell the success of many novelties or how long they will continue popular, the park man prefers a long-term rental or percentage agreement as against outright purchase. Should the attraction be a big success, he is sure to feel disgruntled

because he is not receiving what he considers a proper share of the proceeds. The only way to avoid dissatisfaction is to embody in the contract with the promoter a clause permitting the purchase under certain conditions of the attraction after one or two seasons have demonstrated its value. By this procedure the park manager avoids big risks and yet has the opportunity to get the best-paying features under his control.

### THE PARK SYSTEM OF THE SEATTLE ELECTRIC COMPANY

No other city in the West, and few in the United States, are more fortunately situated in regard to parks and play-

pany and also on the part of the City Council has provided for parks and playgrounds a sufficient area of well-selected land not only to enable the present generation to enjoy this indispensable requirement for life in a large city, but to provide also for the needs of the future; and the purchase of property for this purpose has not by any means been discontinued. The voters of the city of Seattle, on Sept. 12, 1906, authorized a bond issue of \$500,000 for this same purpose and for the securing of real property for boulevards and driveways connecting the parks of the city into one harmonious and effective system.

Indeed, it is a matter of congratulation that the foresight of the people of Seattle—and this includes the traction corporation as well as the municipality itself—has been broad



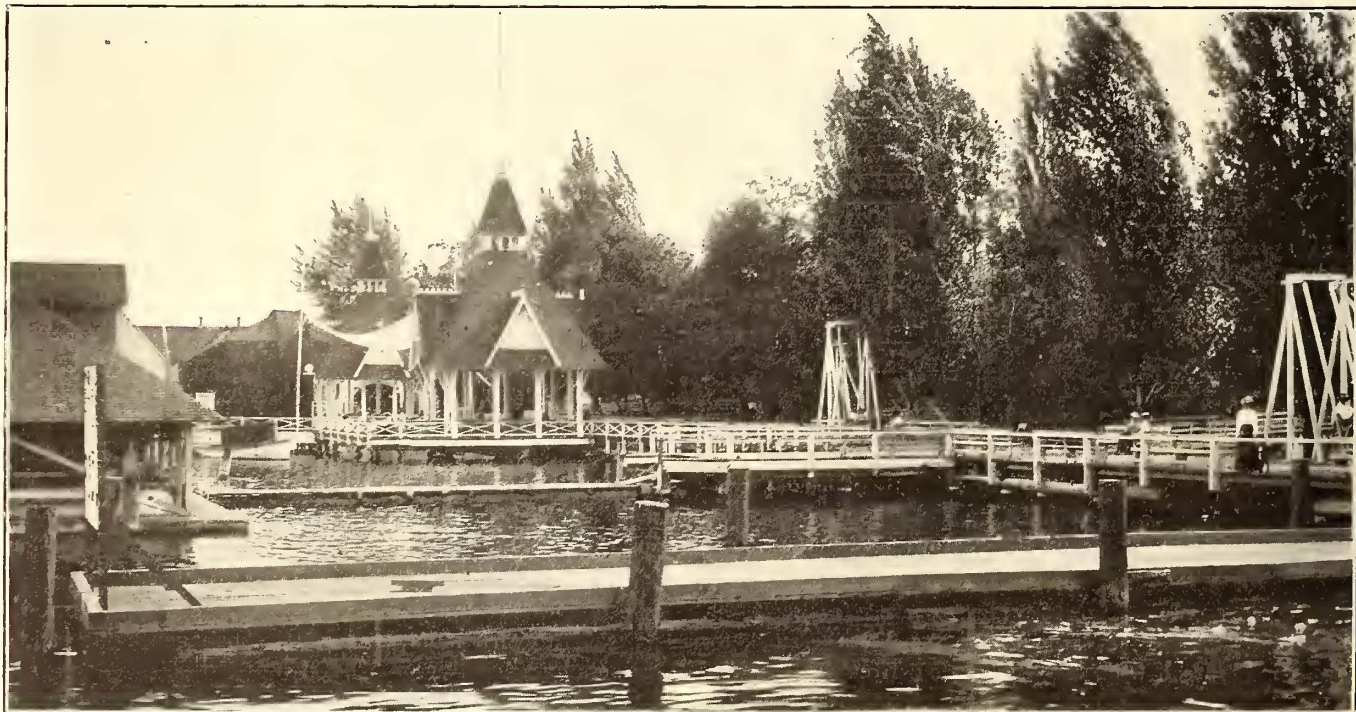
CANOEING IN MADISON PARK



ALONG THE SHORE BETWEEN MADISON AND LESCHI PARKS

grounds than Seattle, the growing and vigorous metropolis of the Pacific Northwest. In all the wide stretch of country bordering the Pacific Ocean there is no section that has a greater or more varied charm in a scenic way than has the

enough to permit of the prediction that, in the not far distant future, the city will be known from one end of the country to the other for her wonderfully beautiful and attractive parks and driveways, for in Seattle there are natural



A SCENE AT THE BOATING PAVILION AND DOCKS IN MADISON PARK, SEATTLE

Puget Sound country, and Seattle, lying between Lake Washington and Puget Sound, with but a trifle more than 2 miles of land separating the two magnificent bodies of water, is conceded to have the premier position on the map.

Wise judgment on the part of the Seattle Electric Com-

advantages in the way of lake, sound, mountain and forest scenery the like of which cannot be found in any other city of the whole West. The variety of the scenic attractions of the city alone is remarkable, and entitles the metropolis of the north Pacific Coast to be termed unique and dis-



tinctive in this regard. The proper safeguarding of these attractions, their wise development by the municipality and the street railway company have already been recognized by tourists and visitors to the city, and the care of these valuable assets in the future will be in keeping with the strong and whole healthy growth of the city itself and the progress made in business, in shipping and commercial pursuits, in the cultivation of the arts and sciences, by the citizens of Seattle.

In any consideration of the parks of Seattle the mind almost instantly takes into view the wonderfully attractive shore of Lake Washington, which forms the eastern bound-

southerly portion of the city; and Madrona Park, which is at the terminus of the James Street cable-Madrona Park line, a combination cable and electric route.

All of these three parks were secured by the Seattle Electric Company when the consolidation of six different systems of street car lines was effected eight years ago by Stone & Webster, of Boston. All of them are well developed and kept in a high state of attractiveness, and all are heavily patronized by the people of Seattle, especially through the spring and summer months. Even during a great part of the winter these parks are the resort of thousands of people of all walks of life, as the weather for a



CANOEING ON THE WATERS OPPOSITE MADISON PARK

ary of the city limits. The universal desire of tourists coming to Seattle and of pleasure seekers is for a trip to the lake via one of the car lines of the Seattle Electric Company. On the shore of the lake this company owns three parks

portion of the winter is ideal for outdoor recreation. There are times in January and February, periods of days and even weeks of dry, bright, warm weather, and the verdure in the parks throughout the year is green and beautiful



A WINTER SCENE IN LASCHI PARK SEATTLE

which are at once among the most popular and attractive in the whole city. These parks are Madison Street, at the eastern terminus of the Madison Street cable line which pierces the center of Seattle; Leschi Park, situated at the eastern terminus of the Yesler Way cable line in the more

to look upon, so that they seldom lack attractiveness.

Canoeing is one of the attractions which has made the parks of the Seattle Electric Company and the environments very popular indeed with the people of Seattle and also with tourists and pleasure seekers from abroad. At

the parks on Lake Washington there are several boat houses with quarters for canoeing clubs and for canoeists. The boat houses are plentifully supplied with the latest makes of canoes and of other boats, and these are patronized to the limit during the Saturday afternoon holidays and the Sundays of the long, delightful summer in Seattle.

There is something infinitely charming about the easy



A RUSTIC ROAD IN MADRONA PARK

buoyancy of a canoe as it glides noiselessly across the waters of the lake—something indefinably distinctive about the comfort and ease with which one may recline among the cushions—something about the long, lazy swing of the paddle, the air and the water and the moonlight nights that make this sport possibly the most popular of all to the pleasure seekers on the lake.

On Sunday afternoon, gathered around the pavilions and the seats surrounding the band stands, may be seen dozens of canoes in which are the youth of the city—young men in white duck trousers and white shirts, with the brown-armed girls in light suits with now and then a touch of bright color to enliven the scene. The picture is a pretty one any Sunday at either Leschi or Madison Park, where the First Regiment Band has regular semi-weekly concert engagements, Wednesday and Sunday evenings and Sunday afternoons.

The largest of the three parks of the Seattle Electric Company is Leschi, at the terminus of the Yesler Way cable line. It is 5.75 acres in extent. It has a frontage on Lake Washington of 558 ft. The park takes its name from Leschi, famous in the days of the Indian wars in the Oregon country as the chief of the Nisqually Indians. During the troublesome period following the Indian uprising of 1854-5, Gov. Isaac I. Stevens was the Governor of the then terri-

tory of Washington, and Leschi proved himself a hero by advising the Indians everywhere to lay down their arms. Leschi Park is reached by the Yesler Way cable line with a service varying between three and four minutes and



ON THE SHORE OF LAKE WASHINGTON, NEAR MADRONA PARK

requiring sixteen minutes to make the trip one way from the center of the business district.

On the Madison Street cable line a service varying between two and three minutes on Sundays and holidays is



A JOLLY CROWD AT THE BOAT LANDING IN LESCHI PARK

maintained. This park has an area of 3.36 acres, with a water frontage of 650 ft. It is in the greatest favor on Wednesday evenings and Sunday afternoons and evenings during the summer season. The band stand is one of the best in the West, and there are many attractions in the immediate vicinity, including beautiful shade trees, boat houses, chutes, cafes, etc. It is no unusual sight to see from 7000 to 10,000 people gathered on the shore of Lake Washington at Madison Park on a Sunday evening.

Madrona is one of the most beautiful of the Seattle Electric Company's parks, lying midway between Madison and Leschi. It is reached by the Madrona Park line, with cable connection on James Street in the heart of the city. The time required for the trip is about twenty-four minutes. This park is also reached by any one of the number of pleasure steamers plying on the lake, which make regular trips between Madison and Leschi Parks. This is one of the delightful side trips of a "seeing Seattle" journey.

The only attractions which the street railway company provides, other than the natural beauty of the parks, are the band concerts mentioned. The company lets all privileges, such as pavilions for dancing, canoe houses, pier landings for steamer lines, and refreshment booths. All leases carry the clause that no intoxicating liquors must be sold on any of the premises, any infraction causing a forfeiture of the lease. The parks are not enclosed, and are free to the public use. H. F. Grant, manager of the Seattle Electric

### SPRING LAKE PARK, TRENTON, N. J.

The Trenton Street Railway Company, of Trenton, N. J., owns a park which, after years of expense, suddenly blossomed into a self-sustaining enterprise during the season of 1906, and now promises to become one of the finest amusement resorts in the State during the season of 1907. Acquired by the street railway company some fifteen years ago, the yearly expenses were accepted for a long time as a matter of course on account of the additional traffic secured for the railway lines.

Last season the park was taken in hand by Peter E. Wurfflein, an experienced newspaper man, who had had considerable local experience in the amusement line. He threw the gates open to the public free instead of requiring a street railway transfer, or 5 cents, as had been charged in the past. The park was cleaned and the whole tract of between forty and fifty acres put in good condition. After this the pavilion was enlarged and the seating ca-



A SUNDAY SCHOOL EXCURSION AT SPRING LAKE PARK, TRENTON, N. J.

Company, has given a great deal of attention to the development of this extensive park system, recognizing their high value as traffic stimulators.

The year around the company employs a force of gardeners, with a head gardener, and maintains a greenhouse to grow through the winter months plants for the beautifying of the grounds during the summer. The rentals from the privileges leased just about take care of the expenses of maintenance of the parks and their accessories.

capacity increased to 2000, about double what it was before.

In the past the park had been a handicap to the management of the railroad company, because it was an additional service for the already busy officers. With the advent of Mr. Wurfflein they were relieved of the work by a man who could devote a large part of his time to it. One of the first moves was to arrest all disorderly persons and prosecute them to the full extent of the law. This action had a tendency to keep the rough element away. The manage-

ment soon experienced but little difficulty with rowdies, with the natural result that the better class of people came to the park for the first time in years.

Despite the fact that there were twenty-nine stormy days during the past season the attendance averaged 25,000 per week, the total exceeding that of the three previous years combined. A vaudeville show, at greatly increased cost; new row and motor boats, moving pictures, with other amusements and refreshment features were installed. The lake was electrically lighted at night, and perfect order maintained. Both men and women were required to remove their hats in the pavilion, a rule which added much to the pleasure of the patrons.

Sunday concerts also were introduced, Winkler's Seventh Regiment Band being secured for that purpose. For many years past this musical organization, which is noted throughout New Jersey, played exclusively for Cadwalader Park, which is owned by the city. The division of the band's



AT THE BOAT LANDING IN SPRING LAKE PARK,  
TRENTON, N. J.

services between Cadwalader and Spring Lake Parks aroused quite a storm of protest in the city until it was discovered that Spring Lake, being lighted at night while Cadwalader was not, was a more desirable place to go to in the evening than Cadwalader and the cost was the same.

The introduction of moving pictures and boating on Sunday was a novelty, and the care with which it was conducted may be judged from the fact that Hamilton Township, in which the park is located, is especially strict in its enforcement of the Sunday laws. No music other than the band concerts was permitted on Sunday, and no sports of any kind were indulged in except rowing on the lake.

Four children's days were conducted by Mr. Wurfflein, and on these days the visitors were admitted to all the amusements without charge, in addition to which several hundred dollars' worth of toys were given away. On the first children's day the attendance was 9400. No Sunday schools had picniced at the park in several years, but a specialty was made of them last year, and as many as seven schools attended in a single day, with a total attendance of 7200. All the nearby Sunday schools were followed

up and invited to make Spring Lake Park their place for picnicing, and on one of the best days the Passion Play was run free for the benefit of these visitors.

A fireworks exhibition also was organized, and several entertainments given by experts secured especially for the occasion. The attendance ran as high as 13,000, and never less than 5000. This fireworks entertainment was free to all.

All the features were advertised liberally in the newspapers, which also ran many reading notices of the features carried on there. The street railway ran both the South Broad Street and Prospect Street cars to Spring Lake, in addition to many extras from the city hall, carrying the largest crowds that had ever been taken to the park. The park paid all operating expenses without help from the street railway.

Spring Lake Park is the only amusement park in Trenton or vicinity, Cadwalader Park being without amusements. It therefore has no competitor in the local field. It is about  $2\frac{3}{4}$  miles from the city hall, being  $1\frac{1}{2}$  miles further than Cadwalader Park, and just over the city line in Hamilton Township adjoining the town of Broad Street Park. Spring Lake Park was called Broad Street Park in the early days of its existence but the town and park of the same name created considerable confusion, hence the change. The fare on the Trenton Street Railway is 5 cents (or six tickets for a quarter) from any part of the city, or from as far as Lawrenceville, on the Princeton line 7 miles from the city hall, or  $9\frac{3}{4}$  miles from Spring Lake. The Trenton Street Railway lines are located two full city blocks from the park entrance, Harrison Avenue (which runs from the tracks to the entrance) being lined with small shops and stands on one side. The Camden & Trenton Railway runs between the park entrance and the Trenton Street Railway.

A movement for the further improvement of this park has just been carried through by the organization of the Trenton Construction Company. The representatives of this company, W. Meredith Dickinson, of Trenton, N. J., and C. H. Oberheide, of New York, have secured the lease and are now preparing to spend about \$200,000. As noted on page 324 of the STREET RAILWAY JOURNAL of Feb. 23, the new features will include scenic and miniature railways, theater, chutes, etc.

### SOME PHASES OF PARK MANAGEMENT

The advent of another open season brings the importance of the street railway park to the front again more forcibly than ever before, for there is a wider appreciation of the value of the park resort as a traffic stimulator than in any previous year. For this reason it might be worth while to consider some of the problems of park management.

There is probably no branch of street railway work which needs to be handled with greater care than this matter of laying out money in pleasure parks. Unless the project is wisely nursed from the day of its appearance on paper to the closing of the gates at the end of the season there is a liberal chance for excessive costs to creep in and turn the venture into a failure financially. It looks like a glittering generality to point out the importance of fitting all park schemes to local conditions, but that is the nub of the whole problem. The tastes and habits of the tributary communities must be sized up at every stage of the game, for the recreations of the factory town often differ diametrically from the amusements of the residential suburb, and the attitude of the people of one section toward out-door life is liable to be the exact antithesis of the feeling in another

community. Knowledge of what the public desires and enjoys is therefore the primary point to ascertain. It is making a leap in the dark to lay out a park resort on the strength of successes in other cities. Any one who travels at all soon learns that cities and towns are as individual as persons, and this is why plenty of local advice should be injected into the scheme to be tried out.

Primarily the effort should be to supply forms of amusement which do not already exist at anything like the same prices in the communities served by the company. Some overlapping will frequently occur, but experience has shown that the place to spend money is on features which add to the sum total of a community's amusement resources, rather than on duplications. It is a hard problem to suit every one's taste, but if there is any single feature of a park layout which is universally approved by the public it is the location of the park close by a sizeable sheet of water. Water adds almost unlimited picturesqueness to any landscape, but besides this, the opportunity to indulge in aquatic sports is a drawing card of tremendous power. Many a park located beside a lake or river has required very little expense for development, and has proved profitable chiefly on account of its natural advantages. In laying out densely wooded parks attention is sometimes omitted in tree trimming, with the result that the place is hot and stifling. The prevailing winds need to be studied with reference to the circulation of air.

Experience has shown the importance of a suitable shelter in climates where showers are frequent, and the erection of a vast log cabin with a grounded tin roof as lightning protection, plenty of comfortable seats and lights inside, with drainage to keep the water away from the floor or bare ground, and space for light refreshment concessions, newspaper stands, etc., will do much to tide over the unprofitable hours when the sky is dark and lowering. In fact, the whole matter of park operation is simply one of ceaseless attention to details. The larger the city served, the more money it is safe to put into these things, but there are certain points which are fundamental in importance—cleanliness, both on the grounds, in all waiting rooms, and especially in toilet rooms; orderliness, secured by supervision of the entire grounds and waters by employees with police powers, or by police detailed for the service during the season; safety to the public, insured by hand-rails in slippery paths and on the edges of declivities; a high standard of light and power wiring, and a reasonable measure of watchfulness in water sports and at the car terminals.

The advisability of building an open-air theater in a park is a question that cannot be solved off-hand, but at the present time there is such a wide public demand for vaudeville that there is not much question about what to put on the stage if a theater seems desirable. It is largely a matter of the rival entertainments available in the towns from which the park draws patronage. A park serving a factory town can seldom afford to charge admission, and a moderate sum is all that is assessable even in parks catering to communities of means. It must never be forgotten that it takes a long time to carry enough passengers to and from a park to pay the cost of expensive landscape gardening and elaborate structures. Fortunately the minor conveniences of a well-equipped park—public telephone service, mail collections, a room where sudden cases of illness can be cared for, swings for the children, seats and picnic tables,—are features which cost little to install and maintain. Whatever may be the policy of the company toward amusement concessions, it should always have supreme control with the right to withdraw any objectionable act or feature

at will. Much can be learned by actually watching the way the public receives the entertainment. In some parks the various amusements are crowded too closely together for the best results. Plenty of light at night is essential, but the various attractions need to be somewhat separated for their maximum enjoyment. The ideal park appeals to all classes of the community; it offers the charm of solitude to the nature lover and the exhilaration of sports shared in common to the patron out for a jolly time. It is hard to adapt a park to widely varying tastes, but it can be done with careful study. Centralized responsibility for the park service, pithy advertising in cars and papers, and detailed analysis of earnings and expenses are the final requisites which the last few years have indicated unmistakably.

## THE EQUIPMENT OF PARK RESORTS

The following series of notes is a continuation of those published in the issue of Feb. 23 upon new attractions and suggestions for the summer park. They are based primarily upon reports received from those who make a business of supplying park attractions.

### ELECTRIC ILLUMINATED FOUNTAINS

One of the difficult problems that confronts the park manager in the selection of attractions is to have a number that will retain their drawing power year after year without requiring heavy maintenance or renewal expenditures. This is particularly true of the illuminated spectacular features, as the people expect to see something different every time they visit the grounds. Among night attractions the electric



THE ELECTRIC ILLUMINATED FOUNTAIN IN ACTION

illuminated fountain with human groupings is a spectacle that has continued popular ever since its introduction in the early days of electric traction.

Much of the work along these lines was originated by C. A. Dunlap, of Electric Park, Newark, N. J., who has designed and installed many fountains of this character in parks throughout the United States. Mr. Dunlap is himself a successful park manager and his claims for the fountain are substantiated by his own experiences with it at Electric

Park, where over 15,000 people have crowded in on a Sunday evening. A clear proof of its popularity in another park is afforded by one of the accompanying illustrations of an electric fountain and its surroundings taken during the day. It will be noted that a very large number of benches are placed around it, as many in fact as would be there if the attraction were a concert.

Of course, if the fountain could not be varied in its spectacular features without going to considerable expense it would not be worth while for the management to keep it up, but its use in connection with living models in different poses, dancing girls, etc., permits an infinite variety at very low expense. The entire act requires only thirty minutes. The following figures are given to show at what moderate cost an electric fountain can be kept up per week: Dancing girl, \$10; four models at \$7 each, \$28; two children for cupids at \$4 each, \$8; a woman to superintend the girls and keep costumes in order, \$15, making the total cost per week \$61, outside of current. The other work in connection with the fountain can be handled by the regular

relatively little of the space should be given over to them and that should be so separated from the skaters that there may be no danger of interference. While these conditions ought to be borne in mind, no general specific can be offered, for it is a question that can only finally be settled by the individual, governed by the considerations in his particular case. This applies also to the question of accommodation for the skaters themselves. Adequate means should be provided for them to adjust their skates without in any way running the risk of interfering with those already on the floor. Some little corner or by-place offers the ideal for this, and removes the skaters from the gaze of the inquisitive public. As to the skates themselves, they have evolved like everything else, and the evolution may justly be said to mean progress in this particular instance. One or two radical innovations there have been, such as the bicycle skate, but for the most part the changes have been rather a refinement in details making for ease of operation. An account was published in the issue of Feb. 23 of some of the skates now on the market. The skating rink is now



A DAY VIEW OF A KANSAS CITY PARK, SHOWING THE LARGE NUMBER OF BENCHES NEAR THE ELECTRIC FOUNTAIN



KANSAS CITY ELECTRIC ILLUMINATED FOUNTAIN, WITH LIVING MODELS

park electrician, stage hands of the theater and other employees without additional expense.

Mr. Dunlap also makes a portable electric fountain in various styles. These are moderate in cost and add greatly to the artistic appearance of a park, both night and day.

#### EQUIPPING THE SKATING RINK

While much has been said about the interest manifest in skating at this time, and details have been given in these columns of the plans for operating rinks as worked out by several companies, the question of suitable equipment has not heretofore received that attention which its importance demands. If the park manager is going to cater not only to those who skate, but to an ever increasing number who, while not skaters themselves, enjoy watching others, and more especially if the manager intends to hold competitions, he should give serious thought to accommodating the spectators. Buildings so fashioned that a gallery is available or can be easily constructed, of course, offer an ideal, for then the crowds can be handled so as not to overrun the skating floor. If, however, dependence has to be had on the floor itself for offering a place for spectators, then

such a popular pastime that particulars will be given of the latest forms of other manufacturers.

One skate, manufactured by the Chicago Roller Skate Company, of Chicago, Ill., is claimed by the manufacturers to possess qualities peculiarly its own. The foot-plate of this skate is stamped from cold rolled steel, and is strengthened against buckling by two parallel corrugations. Still further to add strength to it, there is a malleable, double-riveted brace which bears upon the rubber cushions. The brace, however, is not rigidly attached to the axle, but play is allowed by slots through which the holding bolt projects. The cushions in this skate are of Para rubber and so placed as to receive direct pressure. In this way their life is materially increased and their service in neutralizing jars considerably increased. The cushions can be easily removed. A hollow steel wheel fitted with ball bearing is used, which is light and durable. The skates are adjusted by a key. The company also offers an aluminum racing wheel.

Another skate in general use is the Richardson, made by the Richardson Ball-Bearing Skate Company, of Chicago. Simplicity has been aimed at and achieved in this skate. The foot-plates are of cold rolled steel, corrugated and re-

inforced to insure great strength. The bearings are case hardened and polished, and all parts are interchangeable. A variety of wheels is offered. Steel, aluminum or wood fiber rollers are furnished with regular rink skates, and box-wood or aluminum on racers.

M. L. Kasmar, of Chicago, also offers ball-bearing steel skates, which are said to have especial advantages for rinks.

The Barney & Berry Company, Inc., of Springfield, Mass., say for their skate that it is practical in construction and exceedingly durable. The bearings are of 1/4-in. balls. Retainers prevent the balls rubbing and add to convenience of handling. There is a large demand for the company's product and it is doing a very satisfactory business.

#### THE ELECTRIC SIGN

The value of the electric sign as an advertising medium is best attested by the prolific use of this device in all its various forms at Coney Island, which at night truly becomes a great white way. To enumerate the uses to which the electric sign is put there would be almost impossible. Suffice it to say that it is used for advertising everything

## THE TALKING SIGN

#### A TYPE OF TALKING SIGN

from a certain brand of highball to the leaving of the trains of the Brooklyn Rapid Transit Company, for which it is especially applicable. In fact, its use among railway companies for advertising the departure of cars is extending. This is instanced by the order just placed by the Northern Ohio Traction & Light Company for a sign 18 ft. square to show the time of the departure of limited cars for Cleveland and intermediate points. The sign will be placed on top of the building at the corner of Howard and Market Streets, Akron. Of the use of signs for advertising park attractions proper and the variations that are possible with them much has been said before in the *STREET RAILWAY JOURNAL*. A

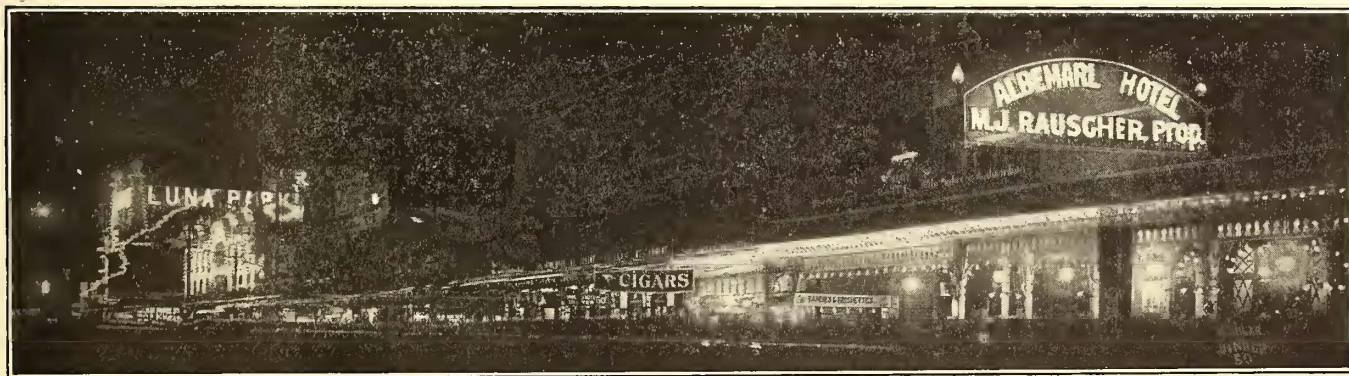
pany has also paid especial attention to the accessories for suspending the signs. For outlining doors, etc., the company offers special trough construction.

Another company that has made signs a specialty is the Electric Motor & Equipment Company, of Newark, N. J., which has developed a special talking sign. This sign is an electrically-illuminated bulletin board which automatically flashes out forty words or phrases. They follow each other without intermission of darkness as long as the motor is allowed to run.

The sign is composed of monograms and the flashing changes are made by means of little machines called commutators, one for each monogram, which makes the lamps light up and go out. It contains three wheels, slotted in forty places. These slots hold the letter bars which govern the lighting and extinguishing of the lamps. The base and top of the commutator are slate, held together by cast-iron standards. Through these standards a shaft runs, on which are mounted the three slotted wheels mentioned above. On the under side of the slate top are twenty curved phosphor bronze springs, one for each compartment, also an equal number of brass contact screws which protrude through the slate and act as binding posts. The letter bars, one for each letter, numeral and character, are made of cold rolled steel, of a special size, and so cut that projections or teeth are left on one edge. These teeth are the important points of the mechanism, as they directly control the lighting of the lamps in the monograms. One set of this specially constructed gearing is needed to run each sign.

#### LAYING OUT THE PARK ITSELF

As far as the manager is concerned who for the first time is confronted with the problem of laying out a park, there are available a number of firms which make it a specialty to give advice in matters of this kind, and even to draw complete plans and build and equip the resorts. Some of these companies not only do this, but they supply the amusement features developed by them which have proved their worth as moneymakers. One of these companies is



A STRIKING EFFECT WITH SIGNS AT CONEY ISLAND

judicious scheme is to advertise park attractions in the cities along the route of a line by electric signs. A company that makes a specialty of electric signs for display purposes is the Metropolitan Engineering Company, of New York. It offers any variety of signs, and its experience covers some of the largest installations in the country. This company even rents letters for temporary signs. The letters of temporary signs are made of heavy-gaged aluminum and fitted easily in a grooved frame which is supplied for supporting them. The company has a special removable-face letter which permits of ready inspection and repair. The com-

Frederick Ingersoll, of Pittsburg, who built such amusement resorts as Pittsburg Luna Park, Cleveland Luna Park, Scranton Luna Park, Washington Luna Park, "Parque Luna," of Mexico. Mr. Ingersoll also pays especial attention to the construction of scenic railways, roller coasters, aerial swings, scenic rivers and carousels.

#### EQUIPPING THE THEATER

The park manager who runs a theater, no less than the manager of a metropolitan playhouse, is confronted with the question of suitable stage settings. The one subject

likely to engross the park manager's attention, however, is the curtain, that taking precedence even over the scenery. The curtain is something that for some little time is to be before the public, and its make-up generally is accepted as forecasting the program to be presented. But curtains are expensive, and for this very reason the subject of a suitable one is not easy finally to decide. In fact, to cope with the situation thus presented, a special branch of the theatrical business has been developed which is confined to the supplying of curtains, the curtain maker and manufacturers seeking further to increase the sale of their goods by advertisements co-operating to this end. In this way the Lee Lash Company, of New York, is able to offer a variety of curtains to meet any special case, the advertisements on which, confined to not more than five, are so incorporated into the scene portrayed as in no way to detract from the subject of the curtain proper. The company has equipped not a few street railway parks, among them the Brighton Beach Music Hall, at Brighton Beach, N. Y., in which the Brooklyn Rapid Transit Company is interested; the Valley Theater, operated by the Syracuse Rapid Transit Company; the park of the Biddeford & Saco Railway, of Maine, and the park of the Columbia Street Railway Company. Another park supplied by the company is the Electric Park, Newark.

#### THE ARCADE EQUIPMENT

With the segregation in the penny arcade of the penny vending machines has come changes in the make-up of these devices that have made them approximate a little more closely a thing of beauty than when the general practice was followed of scattering the machines throughout the resort and placing them oftentimes where they were without protection from the elements. That such machines pay well when given ordinary attention is well established, and that they are large money-makers when judiciously handled in the arcade also is well established. Moreover, it can not be argued against them that they are lacking in the essential of ever being new, for they are constantly being modified and adapted to some new service. The extreme has even been reached of delivering pie from these machines. Fixing up and maintaining an arcade with these machines can also be made a feature of park management with which the railway man need concern himself only remotely, for such firms as the Mills Novelty Company, of Chicago, and others undertake the whole burden of establishing arcades and putting them in operation. This company furnishes the machines, the interior decorations, advertising devices and everything else required. The company also installs all the apparatus and furnishes an experienced operator to look after the installation until the local management feels that it is prepared to look after matters itself.

As illustrating the uses to which the slot machine has been put may be mentioned its modification so as to make possible the turning out of name plates. A machine of this kind is made by Roovers Brothers, of Brooklyn, N. Y., and has proved very popular. It is exceedingly simple to operate and the signs turned out are a finished product and may be used for family letter boxes, desks, etc.

F. S. Zimmerman, of New York, is a manufacturer who also has to offer for installation in the arcade and for distribution throughout the park any number of types of slot machines.

#### ATTRACTIONS FOR THE THEATER

Vaudeville is the proper caper for the summer theater. The season is one of frivolity, and while vaudeville does not necessarily mean a frivolous show, nor is such desired, it

offers that variation which prevents one from becoming bored. Perhaps, as a preliminary, some descriptive music, such as made for the fame of a certain coast resort at New York, whose only amusement attraction for years was a music hall, afterward a sensational animal show. Then some popular airs sung by a real artist and so through a program of, say, eight or ten numbers. Among the firms prepared to furnish shows is John C. Jackel & Company, of New York, who put on sensational animal, circus, novelty and vaudeville acts.

J. W. Gorman, of Boston, who has been before the managers of street railway parks ever since the park idea was first evolved, offers this season a special line of attractions especially suited to street railway park conditions. Mr Gorman is one of the circuit managers, and arranges for a show to meet individual requirements, his large number of "stars" making it possible for him to do this.

#### MOVING PICTURES

With the perfection by the manufacturers of moving picture machines of devices for removing the liability to fire which heretofore existed, an objection to the machines, which in some quarters was greatly exaggerated, has been finally removed. As to the popularity of the pictures as a form of amusement, that is readily attested by the large increase in output of the machines. The pictures never fail to attract, the ingenuity of the film companies in creating new subjects affording a change of program as frequent as may be desired. As for range of subjects, that is limited only by the creative genius of the designers, who are most prolific of ideas. Moreover, the practice of the machine and picture makers in renting pictures alone makes it possible to change the bill as frequently as may be desired. A great advantage of this system is that the co-operation may be had of the picture firms in the selection of subjects, this being something governed largely by the requirements of the public to whom it is proposed to cater. Among the companies whose energies are devoted entirely to this feature of the amusement business is the American Film Exchange, of Pittsburg, Pa., which not only rents and sells films, but furnishes operatives, repairs machines, supplies carbons, tickets and other essentials. Thus is it possible to plan and execute from start to finish with one firm a complete amusement enterprise of the kind.

Geo. K. Spoor & Company, of Chicago, is another firm that makes a specialty of moving pictures. They build their own machines of exclusive pattern and superiority, and furnish the moving picture exhibitions to all the Orpheum Theaters in New Orleans, Kansas City, Omaha, Denver, Salt Lake City, San Francisco, Los Angeles, St. Paul, Minneapolis, together with the vaudeville houses of Kohl & Castle circuit in Chicago, including the Majestic, Olympic and Haymarket Theaters, and in fact all of the leading theaters of the West, North and South, exhibiting moving pictures week in and week out from every known maker of moving picture films in the world. As moving picture exhibitors of very high class, they furnish only their own apparatus and exhibition complete as wanted, with competent and experienced men in charge, giving the show complete to the very minutest detail. There is only a limited number of these special machines in existence and obtainable through the closing of the theaters for the summer season. Spoor & Company say their particular exhibition is one of unusual merit and of a classification that demands the attention of the park managers whose sole aim is to make the people ride and ride again.



The Kinetograph Company, of New York, reports a constantly growing business among parks and theaters. This company supplies the moving picture machine, a weekly change of bill and an operator, or will sell machines outright and supply new films weekly or oftener as desired upon a rental basis. The company says, however, that its machines can be handled by any park employee. The Kinetograph Company is agent for the machines and films made by the Edison Manufacturing Company.

#### FURNISHINGS

No matter what the enterprise, the question of suitable furnishings enters. In some instances it is only remotely associated with the inducing of patronage. Again, it is a most important factor, and may turn the balance in favor of success. In the park proper it is a question of suitable seats, carefully distributed to afford protection from the sun. Again, it enters where there is a summer theater. Where refreshments are served, and at the soda counter and carousel house it takes the form of suitable drapings and comfortable seats. In one instance on record at Coney Island a portion of a drug store, generally regarded as unavailable for use because it was rather inaccessible, was utilized to good advantage to increase the capacity of the soda fountain by judicious lighting and tasteful furniture, which added a cosy-corner effect. In this case the extreme was even resorted to of miniature steel rod chairs and tables for children. Around a pillar was constructed a seat upholstered in leather. As far as furniture is concerned, there has been an increasing tendency of late toward the use of steel rod furniture. The A. H. Andrews Company, of Chicago, claims that its steel rod furniture is inexpensive, elegant, cleanly and indestructible, and for cigar booths, soda fountains, souvenir stands, etc., has many advantages over wood, more especially that anachronism, the permanent swinging stool.

The E. H. Stafford Manufacturing Company, of Chicago, also makes a specialty of furniture for amusement resorts. This company's products include among other things benches, opera chairs, folding chairs, baseball chairs and office furniture.

#### THE KICKING MULE

All games or amusement enterprises appealing to men in which the baseball enters or skill in throwing is sought to be tested have proved most profitable. Such games had their beginning in throwing balls at wooden babies, and were thought to have reached their climax when the object of the thrower came to be nothing less than the head of a negro. But that was not the finale. Similar amusements have been perfected recently which appeal alike to men, women and children, and do not call for the exercise of especial care by the operator to arouse among the spectators a competition. The kicking mule, made by the Cincinnati Novelty Company, is one of the latest of the devices perfected in which the baseball plays an important part. Naturally, the mule is Maud. The balls are thrown, and the mule kicks as only a mule can kick. The antics of the mule and the efforts of the ball tossers work the crowd into feverish excitement. The apparatus is inexpensive to install.

#### BOX BALL.

Bowling, which is again in public favor, is made possible for the summer park by the portable boxball alleys, introduced and manufactured by the American Box Ball Company, of Indianapolis, Ind. In the game of boxball, which really is a modification of bowling and resembles what is commonly referred to among bowlers as the duck pin game,

can be readily installed in a few hours at slight cost, and is automatic in operation in that no pin boys are required and the balls are returned by gravity. Boxball has the added advantage over bowling of appealing alike to all classes, whereas bowling proper generally is indulged in in public only by the men and here and there a woman member of some club. For this reason the game of boxball has become extremely popular. In boxball, each alley is furnished with five pins instead of ten, and these are so numbered as to make possible a score of 300 in a ten-frame game. Lignum-vitæ balls, 4½ ins. in diameter, are used. Since the introduction of boxball, some three years ago, many street railway parks have been equipped which could not afford a regular bowling alley.

#### THE RIDING GALLERY

The riding gallery seems always to be popular. In fact, the changes in general design and the elaboration of the equipment have tended to renew the interest of the older people in this amusement device. When there is added to the gallery itself an organ attachment of the latest design, giving a large range of pieces, this is especially true. The statement ever seems to be justified that the carousel is the delight of the children, and ever will remain so. As supplied by the Herschell-Spillman Company, of North Tonawanda, N. Y., the riding gallery may be had in any one of a number of designs which offer a range in completeness and magnitude that will meet all requirements.

Another manufacturer who makes a specialty of riding galleries and similar devices is C. W. Parker, of Abilene, Kan. Mr. Parker has to offer a large assortment of merry-go-rounds, shooting galleries, and all kinds of mechanical and electrical shows. In addition, Mr. Parker has a goodly assortment of circus, flat and private cars. Mr. Parker also is the creator of spectacular amusement shows, and was responsible for the popular attractions, "North America" and "Beautiful Bagdad."

#### PARK ACCOUNTING

Organization is everything. As pointed out in the article elsewhere in this issue on the methods in vogue at Electric Park, Newark, the amusement and park managers are beset with peculiar conditions against which it is hard to guard. For this very reason particular attention has been paid to the accounting side of amusement enterprises by the large companies, and as a result there has been established at Chicago a firm of accountants, the Froebel-Dehen Company, which makes a specialty of park accounting. This company says that with the aid of its perfect ticket register, a form specially devised for parks, fairs or carnival requirements, any alert bookkeeper can strike his daily balance for every show in the park, including gate admission, within half an hour; this record covers all data for statistical calculation. This system, so the company says, has enabled it to check out and keep correct tab on 18,000,000 tickets in the past two seasons at "White City," Chicago.

#### THE EMPLOYEES THEMSELVES

There must be some way of distinguishing the park employee from the visitor, and the usual way is to equip the men engaged in managing the different attractions in a distinctive uniform. It is even well to adopt as standard the uniform of the platform men, but slightly to modify it so as to differentiate it from that worn by the car men. In this way the uniforms may be readily converted from one class to the other, which is both desirable and economical. M. C. Lilley & Company, of Columbus, Ohio, make a specialty of uniforms for electric railway employees, theater ushers, guards, bands, etc.

## FINANCIAL INTELLIGENCE

WALL STREET, March 20, 1907.

### The Money Market

Monetary conditions have improved materially during the past week. The influx of funds from out-of-town institutions attracted here by the high rates prevailing at the close of a week ago, and the heavy liquidation in the securities market resulted in a pronounced relaxation in rates for both call and time accommodations. At the beginning of the week when the disturbances in the securities market was greatest, day to day money loaned as high as 25 per cent, while the premium demanded on fixed time loans commanded the legal rate of 6 per cent and a commission, which brought the total charge to the borrower, in some instances, up to 7½ and 8 per cent. Toward the close of the week, however, several of the large local institutions appeared in the market as liberal offerers of call money, which broke the rates on this class of accommodation to 4 per cent, while the commissions previously exacted on time loans entirely disappeared. At the close of the week the local situation had assumed almost normal conditions, but the immediate future of the market is somewhat uncertain. This is emphasized by the fact that only one bid was received by the city of Philadelphia for its recent bond offerings, while the city of St. Louis failed to receive a single proposition regarding the sale of its \$3,000,000 3.65 per cent loan. New York exchange at Chicago advanced to 10 cents premium, showing that the demand for money at that center is less urgent, but at some of the other interior cities the inquiry for funds continues. The offer of the Secretary of the Treasury to redeem with interest to July 1, \$25,000,000 4 per cent bonds maturing on the above date has not met with much success up to this time, but it is expected that the depositing of customs collections with the depository banks, which has been authorized by the Treasury department, will sooner or later have a beneficial effect. Since March 15, the local institutions have gained \$1,500,000 on their operations with the Sub-Treasury, which compares with a loss of \$3,480,000 in the same time a week ago. The low prices prevailing for cotton foreshadow a renewal of the export movement of the staple, but this factor has been partially offset by the sale of American securities by foreigners. Sterling exchange, however, continues at the gold import point, but so far only small amounts have been picked up in the European markets for shipment to this side.

The monetary situation abroad is strained and in some quarters advances in discount rates, both by the Bank of England and by the Imperial Bank of Germany, are looked for. The Bank of England continues to absorb all the gold arriving in London from South Africa, and it is expected that the greater part of the \$2,500,000 gold due to arrive at the end of the current week also will be taken by that institution.

The bank statement published on last Saturday was better than expected. Loans decreased \$13,380,300 as a result of the heavy liquidation in stocks. Cash decreased \$2,997,300, or considerably less than indicated by the preliminary estimates. The reserve required was \$3,978,675 less than in the previous week, thus increasing the surplus reserve by \$981,375. The surplus now stands at \$3,033,100, compared with \$5,865,125 in 1906; \$5,154,175 in 1905; \$27,310,575 in 1904; \$3,180,400 in 1903; \$3,471,250 in 1902; \$10,002,600 in 1901, and \$2,686,425 in 1900.

### The Stock Market

The stock market during the past week has been excited and sensational in character, with price fluctuations that have not been equaled since the panicky days of 1901. In some instances certain of the active stocks sold even lower than they did during that period of stress six years ago. There was heavy liquidation, together with active short selling, especially of the standard railroad stocks, but this movement culminated early in the week, and was followed by a very sharp upturn on which the greater part of the decline was recovered. In this movement there was some substantial investment buying in evi-

dence, while active speculative purchases furnished the principal stimulus for the recovery. Following the publication of the bank statement, and over Sunday consideration of the speculative position, and the rumors from Washington having relation to the plans of the administration regarding control of railroads, there was a resumption of the selling movement, and the greater part of the recovery was lost, while the pressure directed against certain of the leading issues developed a feeling of demoralization, accompanied by some very sinister rumors, none of which took on practical form. It was said that some weak spots had been strengthened by banking assistance, and, that, as a result, there was and is, little probability of any failures. The general situation has not changed materially, and while money rates here declined and sterling weakened, the foreign markets continued firm, and all the gold laid down in London was taken by the Bank of England, thereby disposing of the rumor of imports of any substantial amount of the yellow metal by New York brokers. Trade conditions are less satisfactory, owing to the heavy floods and extensive damage in the Ohio Valley, the damage at Pittsburg alone being sufficient explanation of the heavy selling and weakness in United States Steel stocks and some of the trunk line shares. Aside from the various rumors, having apparently a Washington origin, there has been no development that would clearly explain the panicky features of the past two weeks. The technical position of the market has undoubtedly been improved by the heavy liquidation. Notwithstanding that there has been no adverse change in the copper metal situation, the metal stocks have all been weak, and heavy selling of Amalgamated Copper and American Smelting went far to increase the general uncertainty. One good feature of the present situation is that commission houses have not been carrying any large line of stocks on margin, as the speculative public have ignored the stock market for a considerable time, and have given attention almost entirely to mining stocks.

The traction stocks moved in sympathy with the general market, and opinion regarding these issues will continue uncertain, pending further developments in connection with the public utilities bill which will come up for a hearing before the Senate Judiciary committee the latter part of the month.

### Philadelphia

Transactions in the local traction shares were considerably larger during the past week, but they were accompanied by a very irregular price movement. In the early dealings, practically all of the active issues reflected the liquidation in other quarters of the securities market, but toward the end of the week the market steadied, and in most instances the early losses were fully recovered. Philadelphia Rapid Transit was an exception to the general rule; opening at 19¼, the price yielded on heavy selling to 16¼, the lowest price recorded for the stock for a long while, and from which it recovered 1¼ points. About 40,000 shares were traded in. Union Traction ran off in sympathy with Philadelphia Rapid Transit, the price declining from 55½ to 53, but at the close there was an advance to 56. Philadelphia Company sustained an early loss from 44¾ to 43, but later rose to 45, while sales of the preferred took place at 46. Philadelphia Traction, after selling at 90½, advanced to 92. Other transactions included Railways General at 6, United Traction, of Pittsburg, preferred, at 47; American Railways at 49½; Lehigh Valley Transportation preferred at 20¾ to 21; United Companies of New Jersey at 248 to 250; Camden & Trenton at 1¾, and Union Traction of Indiana at 33.

### Baltimore

Interest in the Baltimore traction issues centered almost entirely in United Railway issues, which were active and irregular. The 4 per cent bonds, after a decline from 86½ to 84, advanced to 87, on transactions amounting to \$75,000, while the incomes, on dealings of more than \$100,000 moved from 52 to 51½ and back to 52¾. The free stock sold at 10½ to 11½, while the certificates representing the pooled stock brought 10½. Atlanta Street Railway 5s sold at 102½ and 102.

**Other Traction Securities**

The Boston market for traction shares was moderately active and generally lower. About the only issue to display strength was Boston & Worcester common, which, after an early decline to 22¾, advanced sharply to 26. The preferred stock sold at 74. Boston Elevated broke from 147 to 144½, and recovered only a fraction, and Massachusetts Electric common, after selling at 17½, ran off to 16 and recovered a point. The preferred stock lost 1½ points to 64. Boston & Suburban common sold at 14, and the preferred at 57 to 55, the transactions at the latter figure being ex. the dividend. West End common changed hands at from 94 to 92½, and the preferred at 107 to 106. The Chicago market was practically neglected. A few transactions in Metropolitan West Side Elevated were reported at 67 to 65. West Chicago sold at 20 for a small lot.

Aurora, Elgin & Chicago was in demand on the Cleveland Stock Exchange at times within the past week, and some of the stock changed hands. It held around 34 for several days and closed at 34½, with 35 asked. Cleveland & Southwestern was bid at 11, with the preferred stock in demand at 55, and 61 asked. Forest City still holds its own well at 95 bid, notwithstanding the stories on the street regarding the probable settlement of the traction fight. There has been little activity in Cleveland Electric for several days, and it will probably not be in demand until something more definite is known from the consultation room of Messrs. Andrews and Du Pont. Holders of stock are asking 63½, while 60 was bid.

**Security Quotations**

The following table shows the present bid quotations for the leading traction stocks, and the active bonds, as compared with last week:

	Mar. 13	Mar. 20
American Railways .....	50	49
Boston Elevated .....	147	145
Brooklyn Rapid Transit .....	55	54
Chicago City .....	150	150
Chicago Union Traction (common).....	4¼	4¾
Chicago Union Traction (preferred).....	13	13
Cleveland Electric .....	65	—
Consolidated Traction of New Jersey .....	72	71
Detroit United .....	72	69
Interborough-Metropolitan .....	24¾	24
Interborough-Metropolitan (preferred) .....	60	58½
International Traction (common).....	54	54
International Traction (preferred), 4s.....	79	79
Manhattan Railway .....	137¼	135
Massachusetts Elec. Cos. (common).....	17	16½
Massachusetts Electric Cos. (preferred).....	65	63
Metropolitan Elevated, Chicago (common).....	23	23
Metropolitan Elevated, Chicago (preferred).....	65	64
Metropolitan Street .....	—	—
North American .....	73¾	73¾
North Jersey Street Railway.....	40	40
Philadelphia Company (common).....	44	43
Philadelphia Rapid Transit .....	17	16¾
Philadelphia Traction .....	*91½	92
Public Service Corporation certificates.....	66	65
Public Service Corporation 5 per cent notes.....	95	94
South Side Elevated (Chicago).....	78	80
Third Avenue .....	103	106
Twin City, Minneapolis (common) .....	93	94½
Union Traction (Philadelphia).....	55½	54

\* Ex-dividend.

**Metals**

According to the "Iron Age" the flood in the Pittsburg district has led to a serious loss in production, both on the part of blast furnaces and of steel works and rolling mills. The impression, however, that all of the plants were affected is not quite correct. There is very little doing in basic pig. At times an urgent demand for spot foundry iron crops up for which premiums are obtained. Satisfactory reports come from the finished iron and steel trades, particularly so far as the lighter lines are concerned.

Copper metal holds strong at unchanged prices. They are: Lake, 25¾ and 25¾; electrolytic, 25¼ and 25¾; castings, 24½ and 24¾.

**OFFICERS NOMINATED FOR NEW ENGLAND CLUB**

The nominating committee appointed by President Winsor, of the New England Street Railway Club, to present a list of officers to be voted for at the annual meeting, Thursday, March 28, has made its report, and the recommendations are given below. The annual business meeting will be held at 3 o'clock in the afternoon of March 28, at Hotel Somerset, Boston, and balloting for officers will begin at 3.30 o'clock. As stated in the STREET RAILWAY JOURNAL last week, the annual banquet will be held in the evening at Hotel Somerset.

Nominations for officers, 1907: President, Henry C. Page, Springfield, Mass.; vice-presidents, M. C. Brush, Newtonville, Mass.; Horatio Bigelow, Norwich, Conn.; J. Brodie Smith, Manchester, N. H.; F. H. Foote, St. Albans, Vt.; D. F. Sherman, Providence, R. I.; E. A. Newman, Portland, Me.; secretary, John J. Lane, Boston; treasurer, N. L. Wood, Boston; executive committee, Paul Winsor, Boston, Mass.; W. D. Wright, Providence, R. I.; C. H. Hile, Boston, Mass.; John F. McCabe, Worcester, Mass.; E. A. Sturgis, Boston, Mass.; Charles C. Pierce, Boston, Mass.; George C. Ewing, Boston, Mass.; finance committee, Henry C. Page, Springfield, Mass.; John W. Corning, Boston, Mass.; E. P. Shaw, Jr., South Framingham, Mass.

**THE SAN FRANCISCO COMPANY'S FINANCES**

Some interesting statements are made by the United Railroads of San Francisco in connection with its request to list on the New York Stock Exchange additional sinking fund gold bonds. The \$1,000,000 4 per cent bonds are secured by first general deed of trust, dated June 7, 1902, given by the United Railroads of San Francisco to the Union Trust Company of San Francisco, as trustee, and make the total amount listed to date \$21,000,000, all of which have been sold and passed beyond the control of the company. The \$4,409,000 4 per cent sinking fund gold bonds of the denomination of \$1,000 each, also sought to be issued, make the total amount of 4 per cent sinking fund gold bonds to be ultimately listed \$25,409,000. The said bonds for which the present application to list is made are for \$1,000 each, maturing April 1, 1927, bearing interest from April 1, 1902, payable semi-annually on April 1 and Oct. 1, either in San Francisco or New York, at the option of the holder. They are in coupon bearer form, but can be registered as to principal at the office of the company in San Francisco.

The company has actually expended in work of reconstruction, betterment and improvement, to the date of this application, upwards of the sum of \$3,870,563.83, and has entered into contracts to be performed within the ensuing six months for additional construction, betterments and improvements, upon the lines above indicated to the amount of upwards of \$7,717,351.29. The company has received from the trustee, duly certified, pursuant to resolution of its board of directors and under the provisions of the deed of trust hereinbefore set forth, out of said reserve of \$5,409,000 bonds, the sum of \$1,000,000 of bonds of \$1,000 each, numbered consecutively 20,001 to 21,000 inclusive, which bonds have been sold and delivered to actual purchasers, and the proceeds thereof applied to the payment so far of the expenditures as made by it as above. A sinking fund equal to 2 per cent of the entire gross earnings of the company, but not less than \$100,000 per year, is provided for in the deed of trust, and began to run Jan. 1, 1905. All surplus income above 5 per cent on the common stock of the United Railroads of San Francisco otherwise applicable to the payment of dividends thereon must also be applied as a sinking fund or for improvements.

Statement of sinking funds:

	Park & Cc. R. R. Co.	Mkt. St. Cab. Ry. Co.
Balance uninvested Nov. 30, 1906.....	\$3,530	\$22,933
Investments (total) to Nov. 30, 1906..	89,872	686,848
Total to credit sinking funds.....	\$93,402	\$709,781
	The Omnibus Cable Co.	United Railroads
Uninvested Nov. 1, 1906.....	\$102,011	\$11,052
Balance uninvested Nov. 30, 1906.....	102,011	11,052
Investments (total) to Nov. 30, 1906...	508,900	276,895
Total to credit sinking funds.....	\$610,911	\$287,947

## ANNUAL REPORT OF THE INTERNATIONAL TRACTION COMPANY

The annual report of the International Traction Company, of Buffalo, for the year ended Dec. 31, 1906, has been issued. The income account compares as follows:

	1906	1905
Gross receipts .....	\$4,972,688	\$4,484,643
Operating expenses .....	2,884,985	2,483,663
Net earnings .....	\$2,087,703	\$2,000,980
Other income .....	69,110	68,562
Total income .....	\$2,156,813	\$2,069,542
Interest, rent and taxes .....	1,691,959	1,652,376
Surplus .....	\$464,854	\$417,166

Surplus is equal to 2.64 per cent earned on the \$10,000,000 common stock after allowing for the 4 per cent dividend on the \$5,000,000 preferred stock.

The condensed general balance sheet of the International Traction Company as of Dec. 31, 1906, compares with that of April 30, 1906, as follows:

Assets.	
Stocks and bonds of other companies .....	\$29,949,763
Organization expenses .....	15,488
Bills receivable .....	3,131,129
Accrued interest on bills receivable .....	112,368
Car trust No. 1 .....	224,835
Car trust No. 2 .....	914,301
Accounts receivable .....	324,234
Fifty-year 4 per cent collateral trust bonds on hand ..	300,000
Funds in bank to pay coupon interest .....	361,860
Funds with treasurer .....	4,791
Total .....	\$35,338,768
Liabilities.	
Capital stock .....	\$15,000,000
Funded debt .....	18,255,000
Car trust certificates No. 1 .....	112,000
Car trust certificates No. 2 .....	570,000
Bills payable .....	425,000
Accrued interest on funded debt .....	362,227
Accrued interest on car trust certificates .....	1,069
Surplus .....	613,473
Total .....	\$35,338,768

President Pierce says in his annual report that inasmuch as the company cannot increase its bonded indebtedness, it will be necessary, in order to carry out its undertakings, not only to expend the profits of 1907, but also to borrow \$1,000,000 from the banks. This means that the payment of dividends must be further delayed. During the year ended Dec. 31, 1906, the surplus amounted to \$464,854, which was sufficient to allow of the 4 per cent cumulative dividend on the \$5,000,000 outstanding preferred stock and to leave an amount equal to 2.64 per cent on the \$10,000,000 common stock. During the previous year the preferred dividend was carried and a balance equal to 2.10 per cent on the common stock.

The undertakings mentioned by President Pierce consist of building within the next eighteen months a new double-track line over the company's own right of way between Buffalo and Niagara Falls, connecting at Tonawanda with its Lockport division. The company also contemplates building additional tracks in various streets of Buffalo in order to relieve the present congestion of street car traffic and to afford proper transportation facilities. Franchises for the construction of some of these tracks have been secured, and the other franchise necessary will probably be secured in time to permit of all of the work being done before the close of the present year.

During the last year the company completed its new car shop and a new sub-station on the east side of Buffalo; constructed 12 miles of track in Buffalo, and added 150 new cars to its equipment, at a cost of nearly \$1,000,000.

## AN IMPORTANT DECISION IN NEW YORK REGARDING THE BUILDING OF PARALLEL STEAM AND ELECTRIC LINES

In granting a certificate of public convenience and necessity to the Rochester-Corning-Elmira Traction Company, the Appellate Division, sitting in Rochester last week, handed down a lengthy decision, a considerable portion of which was devoted to the expediency of permitting electric roads to be constructed parallel to established steam roads. The opinion, by Justice McLennan, with all other justices of the Appellate Division concurring, states that the fact that electric lines parallel steam railroads does not constitute a valid objection to the former, although it may reduce the earning capacity of the latter. This, the opinion cites, has been the decision of the courts in many similar cases, and electric roads have been built through the State not only parallel to, but within sight of the roads operated by steam.

The real dissension of the Appellate Division from the opinion of the State Railroad Commission, which denied the company the right to build, was on the question as to whether or not people residing in the territory through which it is proposed to operate the new road are already reasonably well supplied with transportation facilities by means of the steam roads and existing trolley connections. The Board was of the opinion that such was the case, especially as the steam roads have expressed the intention of changing their motive power to electricity and improving their service. On this point the decision of the court says:

The question was not whether the through transportation facilities between termini or even between the larger cities were inadequate, but whether the people living along the line of such steam railroad and between its stations required additional facilities. Indeed, between points a long distance apart the trolley roads do not compete with the steam roads. The passengers and freight which the former carry are as a rule carried to the station of the latter. In all essential respects, the two serve separate purposes, each equally necessary to the convenience of the public.

This policy has been adopted by the Board of Railroad Commissioners so uniformly that it may be regarded as the settled policy of the State, to wit: to permit steam railroads to be paralleled by trolley roads, however ample the facilities furnished for travel by such steam roads between terminal points or between principal stations, and so notwithstanding such trolley road may reduce the earnings of the steam roads. The primary purpose of a trolley road is to convey people directly from their homes to the nearby villages or cities or vice versa.

The opinion says that facilities for through service between Rochester, Corning and Elmira are now reasonably adequate, but the evidence demonstrates that the facilities for local traffic are wholly inadequate upon the entire route (except between Corning and Elmira), that trains are run infrequently; that the stations are comparatively long distances apart and that a considerable portion of the territory is not accommodated by existing railroads, which will be no more closely paralleled by the proposed railroad than such railroads usually have been by such construction in other parts of the State.

The fact that the Erie Railroad Company proposes to electrify its road does not materially alter the proposition. That does not mean that it is to be converted into a street surface railroad, but rather that the motive power for the transportation of passengers will be changed from steam to electricity. Regular trains, passenger and freight, will be run then as now, must be run on schedule time, and will only stop to take on or let off passengers at the regular stations. The passenger trains may run more frequently, but, with all the changes suggested, the people along the route will not have such facilities as is understood will be afforded by a street surface railroad. The evidence shows that the population to whom the line of the proposed road would be reasonably accessible averages between 400 and 500 per mile, not including the population of either Rochester or Elmira, and the evidence very conclusively shows that such population has at the present time very inadequate transportation facilities along the greater part of such route. That fact becomes apparent upon examination of the time-tables of the existing roads.

It does not necessarily follow that the present facilities for through traffic between the termini are not reasonably adequate, but it can hardly be contended that the local demand has been reasonably met. And it is established beyond doubt that with additional accommodations the demand would be largely increased. In addition, it is true that considerable portions of the territory through which it is proposed to operate the road in question have practically no railroad facilities. We think the evidence fails to show that such conditions will be materially changed

even after all the improvements which are under way or are contemplated by the opposing companies have been made. When all is completed, practically none of the facilities offered by a street surface railroad, if properly operated, would be afforded to the inhabitants of the territory in question.

From Albany to Buffalo street surface railroad companies have been authorized to construct their roads within sight of the railroad of the New York Central for practically the entire distance, and so, although upon such road passenger trains are run in each direction hourly or oftener, it was not considered an objection that such new road would reduce the revenue of the old, or that it had ample facilities to accommodate a much larger traffic. We fail to see how a distinction can properly be made as between such cases and the one at bar.

Upon the whole evidence and after giving full consideration to the many suggestions of able counsel, we conclude that the order applied for, directing the Board of Railroad Commissioners to issue a certificate of public convenience and a necessity, should be granted, but without costs.

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## ARRANGEMENTS FOR EXHIBITS AT IOWA CONVENTIONS

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A special notice has been issued to manufacturers' representatives with reference to the convention of the Iowa Electrical Association and Iowa Street and Interurban Railway Association, to be held at Clinton, Ia., April 18, 19 and 20, 1907, as previously noted in the *STREET RAILWAY JOURNAL*. As is customary at all conventions, it will be necessary for delegates to "double up," *i. e.*, more than one man in a room, and in the case of very large rooms, possibly three or four. The rates at the hotel will be: Outside rooms with bath, \$3.50 each person per day; outside rooms without bath, \$3.00 each person per day; court rooms without bath, \$2.50 each person per day. All rooms are on the American plan. In case the Lafayette Inn will not accommodate all delegates and manufacturers' representatives, reservations have been made at the Revere House and the Grand Hotel, at the same rates, no baths, as at the Lafayette Inn. Space for exhibits, also current for light and a limited amount of power will be provided in the basement of the Lafayette Inn, free of charge. The only expense to exhibitors will be that of providing materials and labor for erecting and dismantling booths and the moving of their goods. The exhibition space, which consists of thirteen 10 x 8 divisions, three 7 x 10, one 7 x 9, two 4 x 6, and one 8 x 8, is clean, well lighted and suitable for the purpose. Current furnished will be single-phase, 60-cycle, 110 and 220-volt alternating, and 600-volt direct current. Arrangements have been made with the Western Passenger Association for a rate of one and one-third single trip fare on the certificate plan, from any part of the State of Iowa and from Chicago, St. Louis and Minneapolis, based on a single-trip rate of 3 cents per mile. The committee asks to be informed by the manufacturers of their intentions by April 15.

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## THE FLOODS IN THE CENTRAL WEST

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From all over the Central West come reports of damage to street railway property by the floods. Pennsylvania and Ohio roads especially seem to have suffered, and more particularly the territory adjacent to Pittsburg and Cincinnati. The latter city on Thursday evening, March 14, was visited by a very heavy storm, and for 30 minutes not a street car in the city was able to move, and some of the lines were badly crippled afterward. The East End line was clogged with stones and rubbish washed from cross streets in some places 3 or 4 ft. deep, and it was some hours before this could be removed. The lower end of the Sedamsville line was covered in places with water to such a depth that the cars could not move. Landslides blocked the Warsaw and Elberon lines in places, and a number of cars were derailed as a result. A number of other lines were seriously crippled. The Walnut Hills tracks, reaching a fine residence portion of the city, escaped.

The street and interurban cars about East Liverpool were compelled to cease operations or run in a very limited way, as a result of a rapid raise in the Ohio River, while the electric light plant shut down. Wheeling, W. Va., was cut off from the outside world also, both the steam and interurban roads being covered with water.

Between New Philadelphia and Uhrichsville the tracks of the Northern Ohio Traction & Light Company were under water to the depth of 3 ft. Wednesday and Thursday, and all traffic was cut off. At Zanesville the water also greatly hindered trolley operations, and the Scioto Valley Traction Company has had difficulty in keeping its cars in operation. Many other places have suffered greatly from the flood, which results from heavy rains falling while the ground was covered with several inches of snow.

Buckeye Lake, on the Newark division of the Indiana, Columbus & Eastern Traction Company, overflowed and did much damage to property near it. The flood gates had been opened, but they did not relieve the situation rapidly enough.

As previously stated, the lines in the Pittsburg district were hard hit. The Johnstown Passenger Railway Company had certain lines out of operation for some little time, and the power house was flooded. Johnstown experienced the greatest flood since the catastrophe of 1889. The tracks of the Altoona & Logan Valley Railway were covered with several inches of water at Buena Vista. The lines along the Susquehanna River were not greatly inconvenienced, the ice passing off without causing serious damage.

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## CAMBRIDGE SUBWAY STATIONS AND RAPID TRANSIT

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In connection with the development of the Cambridge subway plans by the Boston Elevated Railway Company, the question of the number of stations to be located between Park Street, Boston, and Harvard Square, is at present one of much local public interest and discussion. Opinion in some cases favored the establishment of but one station between these points, while in other instances the demand is for four or five stations. The company favors the single station plan, pointing out that the greater portion of the public—perhaps 80 per cent—will come nearer getting rapid transit by the location of a single intermediate station at Central Square, Cambridge, than by the establishment of four stations for the benefit of people desiring frequent stopping places. Both Harvard and Central Square are local points for heavy passenger traffic, and many car lines traverse one or both of these localities. Transfers from local surface cars to through subway trains making express runs between Central Square and Boston, and between Central and Harvard Squares, can be made with the same readiness which experience has shown feasible at all the elevated stations in Boston proper.

With infrequent stops it is expected that the trains in the Cambridge subway will be able to make 40 m. p. h. on straight track, and with a stop at Central Square only it is estimated that the run from Harvard Square to Park Street can be made in 8 minutes or less. The establishment of three more stations would increase the running time 5 minutes, or 62.5 per cent, because with frequent slow-downs, stops and starts, the maximum speed can be maintained only for a fractional part of the distance to be covered.

It is to be hoped that in this instance the single station plan will prevail, for there is no question in the light of Boston experience that the location of stations relatively far apart in the middle territory between the business districts and the rapid transit terminal stations was a wiser policy than would have been the establishment of a multiplicity of stations for intermediate traffic. It is fair to assume the surface and subway lines in Cambridge will supplement each other in the same general way now in effect in Boston. It is impossible to build a railroad in any populous region without some heartburnings on the part of that portion of the public which does not get stations in its immediate neighborhood. This applies even to pole stops, as was recently shown on another division of the Boston Elevated system. In the latter case, at the request of certain inhabitants along the route, some of the old pole stops were cut out in the endeavor to give faster service. Other inhabitants strenuously objected to the reduction in stops, and so the original service was resumed. The privilege of boarding or leaving a trolley car at practically any street corner is thoroughly ingrained into the public temperament, despite the antipodal attitude of mind observable in steam railroad patrons. Nothing is more certain than that the only salvation of some lines in the way of giving faster service is by reduction of certain stops, but it looks like a very difficult task to bring this home to the public's intelligence.

## CONTRACTS AWARDED BY SCHOEPF SYNDICATE

Contracts awarded by the Schoepf syndicate provide for the construction of concrete steel bridges and the grading of 45 miles of road between Lima and Bellefontaine and 31 miles between Leipsic and Toledo, and reconstruction work on 9 miles of road between Middletown and Hamilton. The Indiana, Columbus & Eastern awarded the contract for the work between Lima and Bellefontaine; the Cincinnati Northern Traction Company, that between Hamilton and Middletown, and the Stratford Construction Company, of New York, the line between Leipsic and Toledo. J. C. Carland, of Toledo, a steam railroad contractor, secured the contracts. The construction of the two pieces of road will complete a line from Cincinnati to Toledo, the Schoepf interests already reaching Bellefontaine from the south. The Lima & Toledo Traction Company is a part of the same system, and will complete the line into Toledo. The reconstruction of the Middletown-Hamilton section will take the road off the public highway and make possible much better speed. From Lima to Fort Wayne the company will have connection, and the electrifying the steam road from Lima to Defiance will give a start toward Michigan territory in another direction. Contracts for rails will be let shortly.

## NEW YORK COMMISSION TO DISCONTINUE REPORTS FOR GREATER NEW YORK

The State Board of Railroad Commissioners of New York has decided to discontinue, at least temporarily, the issuing of the quarterly reports showing statistics as to transportation in Greater New York. These reports have been issued every three months for several years and have been remarkably complete in their detail. They have given for each quarter the cash fares, the transfers and the total cash fares and transfers received by each street railroad operating company; the greatest number of passengers carried in one day, the car mileage, and the number of transfer points.

## OHIO MEN NOT FORCING FREIGHT INTERCHANGE

Electric railway managers at Cleveland resent the statement purporting to come from the steam railroad interests that the trolley managers are making a concerted effort to force the steam roads into an interchange of business through the Interstate Commerce Commission. The report originated through the story from Chicago to the effect that the Chicago & Milwaukee Electric Railway Company had filed a petition with the Commission to force the Illinois Central and the Yazoo & Mississippi roads to enter a rate agreement with them. Although the Interstate Commerce Commission has declared the electrics to be common carriers, the electric railway managers say there has been no concerted action to force an agreement. Some of the roads now have individual agreements with the steam lines and on such freight as can be handled on a through basis is taken. This, however, is a matter between the roads making the agreement and has nothing to do with the others. Few of the roads in Ohio make any attempt to handle anything more than light freight and packages.

## LEGISLATION IN SOUTH DAKOTA

The only enactment of the late legislative session in South Dakota which bears upon street railway work was an amendment to the State corporation laws, allowing the extensions of charters for such utilities for a period of thirty years in any city of 10,000 or more population, when such extension of charter life is authorized by a vote of three-fifths of the voters of the city. The normal charter life under the laws of the State is twenty years, and this is not considered a long enough time for the floating of securities for street railways. The real intent of the law was to allow the construction of a street railway system in Sioux Falls, which has been attempting to secure such an improvement for a number of years. A company now promises a system in case the required vote is assured at the coming city election.

A measure which passed the Senate but failed in the House was to give electric railways right of way on the highways of the State. Ninety per cent of the members of the House were farmers, who instead of looking upon the electric railway as a

benefit to themselves, took the position that there are now, with automobiles and other means of propulsion, enough bogies on the highways. The main purpose of this bill was to secure a right of way for a line from Presho, on the Chicago, Milwaukee & St. Paul system, running west from Chamberlain and Fort Pierre, at the starting point of the Chicago & Northwestern line west from the Missouri River.

## TEXAS TRACTION COMPANY PERFECTING ITS FINANCES

The Texas Traction Company has made a mortgage to the Old Colony Trust Company, as trustee, to secure an issue of \$3,000,000 of thirty-year 5 per cent \$1,000 gold bonds, due Jan. 1, 1937, subject to call at 110, to provide for the construction and equipment of the line now being built between Sherman and Dallas, Tex., 63 miles. Of the bonds, \$2,000,000 are issuable forthwith, the balance being reserved for improvements and extensions, as required under severe restrictions contained in the mortgage. The company was incorporated in Texas in 1906, with \$2,000,000 authorized common and \$2,000,000 6 per cent cumulative preferred stock (the right to cumulative dividends to be computed from the time the road is placed in operation); outstanding \$1,000,000 of each, par \$100 each. Interest is payable in Jan. and July 1 at the office of the trustee. Sinking fund of 5 per cent of gross earnings for the previous calendar year is payable July 1 yearly, beginning 1912, to be used in purchase of bonds at not over 110 or to draw bonds (by lot) at that price. Bonds drawn by sinking fund will remain unanceled in the treasury and draw interest for sinking fund purposes, but will not be considered as outstanding. The location of the road is for the most part outside of streets and highways on private land, the company having a perpetual right of way thereon, either in fee simple or by necessary easements, for a double-track road. Over streets and highways the company has fifty-year franchises except in Dallas, where entrance is made over the tracks of the Dallas Consolidated Electric Street Railway. The power house will be located at McKinney, about midway between Dallas and Sherman, J. F. Strickland, president; James P. Griffin, secretary; Osce Goodwin, treasurer. The details of the contract for the construction of the line were given in the issue of the STREET RAILWAY JOURNAL for Dec. 22, 1906.

## THE COUNCIL AND THE STREET RAILWAY AT GRAND RAPIDS

C. M. Clark, president of the Grand Rapids Railway Company, when in Grand Rapids recently, met members of the Common Council for the purpose of talking over the extensions which the Aldermen have insisted upon being made by the company. Mr. Clark put the case plainly, and intimated that if the company complied with the requests of the Aldermen, it would in turn expect from the city an extension of the franchise. In part, Mr. Clark said: "If the Grand Rapids Railway Company were making money we would not hesitate a minute to spend it. In the seven years in which I have been interested here, we have spent all the profits and twice as much again in improvements.

"Another serious question is the life of the extensions and the conditions of the grants. If I was not connected with the Grand Rapids Railway Company now, and you would ask me to invest money in Grand Rapids under the present charter I would not do it. The charter makes it bad for raising money. As an independent business proposition I would not build one of the proposed extensions.

"In seven years we have spent \$1,620,000 in improvements for the Grand Rapids Railway Company. It has been profitable to every citizen of Grand Rapids. In that time the city itself only spent \$2,145,000 in improvements. We think that the money we have spent here has been one of the most potent influences in the development of the city. Our system has been almost entirely rebuilt. What we took was a junk pile, and we have developed it into one of the best systems in the country for a city of this size.

"When we bought the road in 1899 the taxes were \$5,118, and last year we paid over \$42,000. Have any of your taxes increased that much? At the rate which this taxing of corporations is growing the corporations will soon pay all the taxes. Then the country will be ruled by people who don't pay taxes."

Mayor Ellis favors putting the matter of franchise extension before the people to be voted upon.

## LEGISLATION IN PENNSYLVANIA

The flood of new bills of every description will stop March 27, under a resolution adopted this week by the House of Representatives, which provides that after the date above mentioned unanimous consent must be secured in order to introduce a new legislative measure. Mr. Creasy wanted to amend the report of the committee on rules by providing that a new bill may be introduced after that date by a vote of a constitutional majority, but his colleagues didn't think the same way.

Trolley legislation is still to the fore. A new bill introduced this week in the House gives trolley companies the right of eminent domain, but with powers more sweeping than that now enjoyed by any other class of corporations in Pennsylvania. It was presented by Representative Moyer, of Lebanon, who last week had the Homsher Eminent Domain bill referred back to committee for amendments.

The street railway bills presented by Senator McNichol have been laid over. The companion bills in the House are having rather rough sailing, the most vigorous opposition coming from Mr. Scott, Fusionist, of Philadelphia, who is backing the contention of the Philadelphia Trades League.

It is generally believed that the trolley freight bill and the trolley eminent domain bill will reach the Governor before adjournment, although both may be somewhat amended, particularly the latter. The members from the rural districts feel that the more trolley facilities enjoyed by the farmer and the country storekeeper the greater will be their degree of prosperity and comfort.

## PORTLAND RAILWAY POWER FACILITIES

With the completion of the large hydro-electric power station at Cazadero, on the Clackamas River, the Portland Railway, Light & Power Company will have 40,000 hp ready for immediate use, while 90,500 may be obtained in the near future. The Cazadero plant was started about four years ago, though it was planned at least two years earlier. When completed it will represent an expenditure of \$1,000,000, and in point of equipment is probably the most modern on the Coast. It is larger than the Oregon City plant, Station B, the present capacity of which is 12,000 hp, though from the ultimate hydraulic capacity of the Willamette River it is hoped to develop from 30,000 to 40,000 hp if required. At the steam plant in North Portland, Station E, 11,000 hp can be developed, and 2500 hp is available at Station F. This gives a total capacity of 40,000 hp gaging the Cazadero station at 15,000. With the plant projected 2 miles above Cazadero, 25,000 hp additional will be available. The entire dam is cribbing, filled with rocks. The flume, which carries the water from the dam to the reservoir, is built on crushed rock, and follows the contour of the hills along the Clackamas a distance of 2622 ft., where it empties into a ditch which leads to the basin. The ditch is 35 ft. wide and 22 ft. deep, with a length of 2898 ft. The lake or reservoir covers 50 acres when filled to an average depth of 20 ft.

## LEGISLATION IN IOWA

The 2-cent fare bill has passed both branches of the General Assembly of Iowa, has been signed by the Governor and will become operative July 4, 1907. The bill provides that all railroad companies which have annual gross earnings of \$4,000 per mile or over shall not charge in excess of 2 cents per mile for passenger fares; those with gross earnings of over \$3,000 and under \$4,000 per mile shall not charge in excess of 2½ cents per mile, and those with gross earnings under \$3,000 per mile shall not charge in excess of 3 cents per mile. The bill also contains the provision that railroad companies may charge a maximum fee of 10 cents for any distance not in excess of 5 miles. The latter provision will give the street and interurban railroads of the State the right to charge 10 cents for any distance traveled up to 5 miles, unless otherwise provided by their franchises.

The bill requiring street and interurban railway companies to equip their cars with vestibules has passed one house, and a seems probable that it will pass the other. Other bills affecting interurban interests are now up for consideration before the different committees.

## NEW YORK UTILITIES BILL HEARING

The Senate judiciary committee and the Assembly railroad committee, in joint session, will give a hearing on the Governor's Public Utilities bill on March 27. Great interest is being expressed here as to the interests which will appear in opposition to the measure. Representatives of the various transit reform organizations of New York City will be present to advocate the bill, because of the local commission which it creates. Senator Page and Assemblyman Merritt, the bill's introducer, will argue for it if necessary, but the significant part of the hearing will be the opposition manifested and the line taken by its opponents.

## THE PUGET SOUND-CHELAN-SPOKANE SYSTEM

Preliminary work has been begun at various points on the extensive railway system to be included in the lines of the Puget Sound-Chelan-Spokane Railway Company. This company is capitalized for \$12,000,000 and is issuing bonds to that amount; the Snohomish Valley Railway Company is capitalized for \$2,500,000 and has issued bonds to an equal amount; the Puyallup Valley Northern Rapid Transit Company is capitalized at \$3,000,000 and has issued bonds to the amount of \$2,500,000, making a combined capitalization for the Puget Sound-Chelan-Spokane system of \$17,500,000, having a combined authorized bond issue of \$17,000,000.

The contract for the construction and equipment of the Puyallup Valley Northern Rapid Transit Company has been let to the Continental Engineering-Constructing Company, of New York. This company has suitable franchises in Tacoma, Puyallup, Auburn and Kent, and has its northern terminal at or near Renton, where it makes junction with the Snohomish Valley Railway Company and the Puget Sound-Chelan-Spokane Railway Company under very liberal traffic agreements.

The Snohomish Valley Railway Company has its southern terminal at Renton at the above-described junction with the Puget Sound-Chelan-Spokane Railway and the Puyallup Valley Northern Rapid Transit Company, also operating under the same liberal traffic arrangement. The northern terminus of the Snohomish Valley Railway Company is Snohomish, the line passing through the fertile valleys of May Creek, Issaquah and the entire Snoqualmie and Snohomish Valleys to Snohomish, at which point it connects with the Puget Sound-Chelan-Spokane Railway under liberal traffic agreements. The contract for the complete construction and equipment of the Snohomish Valley Railway has also been let to the Continental Engineering-Constructing Company, of New York.

The Puget Sound-Chelan-Spokane Railway has its southern terminus at Renton, as previously described, thence runs in a northerly direction, serving the city of Seattle direct, passing through the Alaska-Yukon Exposition grounds, thence in a northerly direction through an entirely undeveloped, but resourceful, strip of country about half-way between the coast and the Northern Pacific coast line to Snohomish; thence in a northerly direction, avoiding the construction and maintenance of five drawbridges and approximately 3 miles of trestle across the Snohomish River, which is subject to floods. Everett will be served by a connecting line, probably as an extension of their present city system, which line will be less than 2 miles in length from the junction. From Marysville the line follows the coast, passing through Tulalip, Port Susan and Stanwood, thence continuing north through the towns of Fir and Mount Vernon, at which point it curves to the eastward, remaining on the south side of the Skagit River to the Cascades, thence up the south bank of the Cascade to the Cascade Pass near Horse-shoe Basin, thence down the north side of the Stehekin River and the north shore of Lake Chelan to the town of Chelan, thence to Bridgeport on the Columbia River, the crossing of which has not been definitely decided, thence following up the Columbia River by the most feasible route to Spokane or to a practical connecting point with some of the electric roads running out of Spokane in that direction, which connection, however, has not been arranged, but will be undertaken in the near future.

While no official announcement has been made as to arrangements for power, it is reported that plants are to be installed at points on the Columbia, Skagit and Snohomish Rivers.

## FOREST HILLS TERMINAL DEVELOPEMENTS

A tentative sketch showing how the land belonging to Harvard College, about half a mile south of Forest Hills Square, could be utilized as an elevated terminal station was recently submitted by the Boston Elevated Railway Company to the Massachusetts Railroad Commission. The plan as worked out merely answers the board's inquiry as to how this lot could be utilized, and is not a proposition of the Boston Elevated at this stage. The essential features are a loop about 250 ft. wide and 350 ft. long, with separate loading and unloading platforms at the right, where the elevated trains would stop to deliver and receive surface car passengers. Surface cars from the south would reach the terminal over inclined tracks, enabling transfers to be made at a single level. The sketch intimates that the area within the loop formed by the elevated tracks could be used for storage tracks sufficient to accommodate 150 elevated cars, with a car house for 320 elevated cars. There is also a provision for a second loop inside the elevated loop, to allow for platforms on the inner sides of the two stopping places designated at the overhead level. This is understood to indicate the proposed method of handling interurban cars from Providence in case such a road is built. As yet no law exists under which the elevated extension to Forest Hills can be carried south of Forest Hills Square, but a bill has been introduced into the Legislature to authorize the Boston Elevated to take the necessary tract for the terminal—about 14 acres—and to extend its lines to its site.

## BOOKS RECEIVED

"Management of Accumulators." By Sir David Salomons. Ninth edition. New York: D. Van Nostrand Company. 178 pages. Price, \$2.50.

"Continuous-Current Armatures." By C. Kinzbrunner. New York: D. Van Nostrand Company. 80 pages. Price, \$1.50.

"Alternating-Current Windings." By C. Kinzbrunner. New York: D. Van Nostrand Company. 80 pages. Price, \$1.50.

"How to Build a Direct-Current One-Kilowatt Dynamo or a One-Horse-Power Motor." By A. E. Watson. Lynn, Mass.: Bubier Publishing Company. 100 pages. Illustrated. Price, \$1.00.

"Steam Turbines, Practice and Theory." By Lester G. French. Brattleboro, Vt. The Technical Press. 418 pages. Price, \$3.00.

"The Steam Engine Indicator and Indicator Diagrams." By W. Worby Beaumont. New York: D. Van Nostrand Company. London: The Electrician Printing & Publishing Company. 255 pages. Illustrated. Price, \$2.50.

"Railroad Curve Tables." By R. S. Henderson. New York: The Engineering News Publishing Company. 69 pages, with tables. Price, \$1.00.

"The Six-Chord Spiral." By J. R. Stephens. New York: The Engineering News Publishing Company. 68 pages. Illustrated. Price, cloth, \$1.25; boards, \$1.00.

"Water Softening and Treatment, Condensing Plant, Feed Pumps and Heaters for Steam Users and Manufacturers." By William H. Booth. New York: D. Van Nostrand Company. 308 pages. Illustrated. Price, \$2.50.

"Boiler Waters, Scale, Corrosion, Foaming." By William Wallace Christie. New York: D. Van Nostrand Company. 235 pages. Illustrated. Price, \$3.00.

"Practical Alternating Currents and Power Transmission." By Newton Harrison. New York: W. L. Hedenberg Publishing Company. 375 pages. Illustrated. Price, \$2.50.

## NEW PUBLICATIONS

"Air Brake Catechism." By Robert H. Blackall. Twenty-first edition. New York: Norman W. Henley Publishing Company. 374 pages. Illustrated. Price, \$2.00.

No description of this book is necessary, as its successful record through twenty-one editions testifies. It contains nearly 2000 questions with their answers, giving a detailed description

of all the old standard and improved equipment, and also all the necessary information to enable a railroad man to pass a thoroughly satisfactory examination on the subject of air brakes. In the 1907 edition the book has been revised and enlarged, and answers even better than before the needs of air brake instructors and students.

"Quasi-Public Corporation Accounting and Management." By John F. J. Mulhall. Boston: Corporation Publishing Company. 198 pages. Price, \$5.00.

This volume illustrates forms used and gives classifications of accounts as well as a great deal of general information in regard to accounting for water works, gas plants, steam heating, electric light, electric railway and telephone installations. Other topics treated are customers' registers, the purchasing department, sales department, engineering department, depreciation, sinking fund and miscellaneous account forms.

"Elements of Gas Engine Design." By Sandford A. Moss. New York: D. Van Nostrand Company. 197 pages. Price, 50 cents.

This book gives in condensed form the fundamental principles with which a designer of gas engines should be familiar. It discusses gas generation, cylinder design and action governing, etc., and has been compiled from a set of notes used by the author in lectures upon the subject at Cornell University and from articles in various technical papers.

"Practical Lettering with Original System for Spacing." By Thomas F. Meinhardt. New York: Norman W. Henley Publishing Company. 15 pages, paper. Price, 60 cents.

This pamphlet has been published for draftsmen, engravers, sign painters and all who have to design and execute lettering, and is intended especially to correct common errors in spacing. The objections to the common plan of leaving the same space between all straight stems are pointed out and the correct principles are given. The book is illustrated by two plates as well as spacing guides.

"City Roads and Pavements Suited to Cities of Moderate Size." Third edition. By W. P. Judson. New York: Engineering News Publishing Company. London: Archibald Constable Company. 197 pages. Illustrated. Price, \$2.00.

"Economics of Road Construction." By H. P. Gillette. Second edition. New York: Engineering News Publishing Company. 49 pages. Illustrated. Price, \$1.00.

These are excellent discussions of the subject treated. Mr. Judson's work discusses the characteristics and methods of laying stone block, concrete, wood, brick, asphalt, bitulithic pavements and broken stone roads, while Mr. Gillette's smaller book is devoted more to macadam and earth roads. A valuable feature of each is detailed figures of costs.

"Railroad Location, Surveys and Estimates." By F. Lavis. New York: Myron C. Clark Publishing Company. 270 pages. Illustrated. Price, \$3.00.

The author takes up the subject from the reconnaissance and gives a description of the work and the methods followed by him which should be of great value. It is refreshing to see at least one chapter devoted to electric railway location, in which the writer points out several features in which practice differs from that in steam railroad work, notably as in grades. He also offers hints as to methods of projecting locations in towns on property across which it was considered inadvisable to run preliminary lines, by carrying the line on either side of the proposed location and connecting them at intervals through cross-streets.

"The Walschaert Locomotive Valve Gear." By W. W. Wood. New York: Norman W. Henley Publishing Company. 193 pages. Illustrated. Price, \$1.50.

The increasing use of the lighter and more accurate Walschaert type of valve gear instead of the Stephenson link in steam locomotives, makes this book a timely one. Although invented sixty years ago the Walschaert valve gear has been applied to American locomotives only within recent years, but is now being very generally used. The book first takes up the principal of the gear in an elementary way. It then treats of its design and erection from the standpoint of the scientific engineer and master mechanic. The third part discusses its actual work and advantages. Finally, there is a section of instructions as to its use and treatment in the form of a catechism.



## MEETING OF THE CENTRAL ELECTRIC RAILWAY ASSOCIATION

The program has been announced of the convention of the Central Electric Railway Association, to be held at the Algonquin Hotel, Dayton, Thursday, March 28. For the convenience of members in Indiana a special car will leave the Traction Terminal Building, Indianapolis, at 6 a. m., and a cordial invitation is extended to those desiring to make the trip. The executive committee of the association will meet on the evening before the convention. The business meeting will be called at 10:30 a. m., after which the following papers will be read: "Track Bonding," by Thos. B. McMath, civil engineer, Traction-Terminal Company, Indianapolis, Ind.; "Car Wheels for Interurban and City Service," by C. Skinner, master mechanic, Scioto Valley Traction Company, Columbus, Ohio. At the afternoon session these papers will be read: "Trolley Wheels," by M. M. Baxter, electrical engineer, Western Ohio Railway Company, Lima, Ohio; "Car Inspection," by Lees M. Jacques, master mechanic, Ft. Wayne & Wabash Valley Traction Company, Ft. Wayne, Ind. There will be a special report by a committee on express company contracts with interurban railways.

## THE LOUISVILLE STRIKE SETTLED

The strike of the employees of the Louisville Railway Company was declared off Friday, March 15. The settlement of the controversy was brought about by an agreement signed by President Minary for the board of directors of the company, Thursday, March 14, and later by the special committee for the union. Both sides made concessions. The men got an hour, a 10-hour day, 30 minutes for lunch, to be taken from their own time. All the old employees, except those guilty of disorder or of having destroyed property are to be retained by the company and given the same standing they had before the strike. The men are left free to join the union or not, as they choose, but any employee found coercing another to join or not to join, shall be dismissed by the company. The company expresses a willingness to meet a committee of its men on all grievances, real or fancied, at any time. The details of matters in the agreement are to be arranged by the directors and a committee of its own men. This gives the street railway an "open shop." The men withdrew a number of their demands, including the right to demand the discharge of employees not members of the union; the right to demand the reinstatement of discharged employees upon the exclusive investigation by the union; the arbitration committee with outside parties as members, and some other minor details.

## ALLIS-CHALMERS STEAM TURBO-ALTERNATORS RECENTLY PUT IN SERVICE

The Allis-Chalmers Company has been particularly fortunate in successfully placing its steam turbines and generators in service in various parts of the country. Practically without exception these units have been erected, put into operation and accepted in record-breaking time without accident or mishap of any kind. One of the first of the large Allis-Chalmers turbo-alternators to be installed was the 5500-kw unit at the Kent Avenue station of the Brooklyn Rapid Transit Company. Steam was turned on March 22, 1906, to dry out the generator. On March 27, owing to a breakdown in one of the other plants of the Rapid Transit Company, a sudden call was made for power. The new unit was hastily put in operation, and within 20 minutes after the preparations had been completed, it was delivering 4000 kw. Since then this turbine has been operating continuously, generating on an average 6000 kw and up to a maximum of 8300 kw, taking heavy loads on the morning and evening peaks.

At the Brooklyn Edison Company's Gold Street station, the erection of a 5500-kw Allis-Chalmers turbo-alternator was begun in April and completed in very short order, the machine being operated for the first time on June 16. From then on this unit is said to have satisfactorily carried all the load to which it has been subjected.

A 1500-kw Allis-Chalmers turbo-generator unit at the power house of the Memphis Consolidated Gas & Electric Company, Memphis, Tenn., was shipped on Sept. 8, and ready for steam and condenser pipe connections on Sept. 16. On Nov. 15 the

steam connections were blown out and the machine placed in operation. After running for fifteen days the turbine was accepted. The temperature rise of the generator has always been far below the contract guarantee, and both it and the turbine are capable of carrying much heavier overloads than those specified in the contract.

A 500-kw Allis-Chalmers unit for installation in the power house of the Western United Gas & Electric Company, of Aurora, Ill., was delivered complete on Oct. 8, and was put on the circuit Oct. 17. Since that time this turbine and alternator have undergone rigid acceptance tests, both at overload and three-quarter load, with the result of having bettered the guaranteed steam consumption by 8¼ per cent for the overload and 9.6 per cent for the three-quarter load test.

The power station of the City of Jacksonville, Fla., has a 500-kw Allis-Chalmers turbo-generator unit fully erected and operating, and a second unit of the same capacity on the way to Jacksonville, both working satisfactorily.

A number of Allis-Chalmers turbo-generator units shipped within the past month or two have recently been started or are now awaiting steam connection. A 1000-kw unit at the power house of the Kokomo, Marion & Western Traction Company, at Kokomo, Ind., has just been erected. Out of three 1500-kw units for the Milwaukee Electric Railway & Light Company, one now being erected will probably be started up in the course of the next two or three weeks. The second turbine has been received on the ground but its erection not yet begun.

Other turbines are being installed at the plants of the Meriden Electric & Light Company, Meriden, Conn.; of the Canton Light, Heat & Power Company, Canton, Ohio; Indianapolis, New Castle & Toledo Railway, New Castle, Ind., and Kings County Electric Light Company, Gold Street station, Brooklyn, and at other points.

## STREET RAILWAY PATENTS

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

UNITED STATES PATENTS ISSUED MARCH 5, 1907

845,736. Combined Air Brake Setting Device and Alarm; Robert E. Adreon, St. Louis, Mo. App. filed Nov. 30, 1906. A brake valve and a whistle valve combined in a single housing and means for maintaining the air pressure of the train-line on both of said valves to force the same against their respective seats.

845,874. Coupling Apparatus for Fluid Pressure Brake Mechanisms; George E. Kelly and George F. Royer, Wilkesbarre, Pa. App. filed May 1, 1906. An automatic coupling device consisting of two similar sections, each comprising a head having therein a passage adapted to form part of the brake-fluid conduit, a valve adapted to open said passage to the atmosphere, and a pivotally-mounted device adapted to engage the operating device of the aforesaid valve of the other coupler-section.

845,882. Fare Register; Otto N. Moore, Indianapolis, Ind. App. filed May 24, 1905. Details of a register designed to make separate registration and record of cash and ticket fares of varying amounts.

845,900. Trolley Wheel and Harp; Edward S. Roland, Cleveland, Ohio. App. filed Oct. 19, 1905. The trolley wheel is provided with separate and removable tread portions and the bearings of the wheel are also bushed with replaceable boxes.

845,967. Amusement Device; Isidor S. Moscovitz, New York, N. Y. App. filed July 6, 1906. Consists in the arrangement of a super-naturally sized head of a wild animal, the jaws of which are made to open and close, and upon the lower jaw of which a railway track is arranged, the rails being continued rearward and formed to a loop. The movement of a car from its starting point begins automatically at the moment the lower jaw is closed.

845,977. Truck; Edgar Peckham, Kingston, N. Y. App. filed July 29, 1904. One of the objects of this invention is to provide a pedestal construction which shall be adapted to inclose heavy spiral springs and yet possess strength and stiffness to a marked degree.

845,991. Alarm Signal; Robert J. Zorge, Chicago, Ill. App. filed Feb. 28, 1906. A device adapted to be placed adjacent to the track rails of a railway by which torpedoes are automatically fed into a position to be exploded when a train passes in case a switch is open.

846,029. Movable Point Crossing; William M. Henderson, High Spire, Pa. App. filed June 23, 1906. Provides hard-metal switch points of unique construction, said switch points being provided with suitable pick-up devices for guttered wheels, which devices are integral with the hard-metal points.

846,062. Switch Stand; Fred W. Snow, Hillburn, N. Y. App. filed Nov. 10, 1906. A rotatable shaft having projections thereon which engage a spring-pressed bar when the shaft is turned. The switch is thus held in either its open or closed position.

846,122. Rail-Bond; George A. Mead, Mansfield, Ohio. App. filed Nov. 23, 1904. The bond is made up of a plurality of superposed ribbons of copper, which are sheathed in a copper envelope at their ends.

846,147. Automatic Switch; Gerhand Schmitz, Byesville, Ohio. App. filed Sept. 19, 1906. An automatic flying switch for mine cars.

846,185. Electrical Indicating Device; Charles Crandall, Newport, R. I. App. filed June 2, 1906. A block signal system in which sections of the rails are insulated from one another and the joints are placed in staggered relation so that the truck of a small car, such as a hand-car, will not operate the signals.

846,190. Railroad Crossing; Edward T. Dumas, Chicago, Ill. App. filed Dec. 17, 1906. The track rails of the intersecting tracks have short rail sections adapted to slide forward or rearward to make a continuous track over either road, the rear ends of the rail sections forming a splice joint with the track rails.

846,205. Trolley Harp; Charles Hibbard and Warren Hibbard, Sandy Hill, N. Y. App. filed Feb. 28, 1906. A stub-shaft carrying the trolley wheel has triangular bearings in the harp, a cam disc forming one side of the bearing and means for rotating the cam disc so that the stub-shaft may be released and removed through slots extending to the edge of the harp.

846,207. Railway; Stephen E. Jackman, New York, N. Y. App. filed June 18, 1906. Relates to switchback or inclined gravity pleasure railways.

846,210. Brake Mechanism for Inclined Railways; Stephen E. Jackman, New York, N. Y. App. filed June 28, 1906. Gripping brake-shoes mounted in the track engage the sides of a shoe on the bottom of the car.

846,311. Car Replacer; William A. Hutson, Orlando, Fla. App. filed July 5, 1906. Comprises two frogs, each having a lengthwise recess for receiving the head of a rail and each provided with a laterally-extended wing diverging at an angle, each wing having a raised rim and one of the wings provided with a lengthwise convexity and the other with a lengthwise concavity.

846,365. Automatic Trolley Retriever; Robert J. Walker, Anderson, Ind. App. filed Jan. 13, 1906. The retrieving drum is mounted on a worm-shaft, so that in case of excessive unwinding movement it will move laterally to impinge against a trip and cause the retrieving spring to act.

846,378. Wire Retrieving Attachment for Trolley Wheels; W. C. Althen, Columbus, Ohio. App. filed April 2, 1906. The harp has a pair of arms which are pivoted to move upward so as to overlie the trolley conductor. These are displaced by a contact with the hangers in passing.

846,425. Railroad Crossing; John E. Reese, Louisville, Ky. App. filed Sept. 12, 1906. Intersecting track rails, each embodying a movable section divided to comprise end-to-end separable members, and means for shifting one member lengthwise and the other both lengthwise and laterally away from the track rails.

## PERSONAL MENTION

MR. S. R. DUNBAR has returned to the Indiana Union Traction Company, at Anderson, to take up the duties of purchasing agent. Mr. Dunbar formerly was connected with the company in the capacity of purchasing agent and later as passenger agent.

MR. E. L. GREENE, formerly foreman of the general repair and new equipment shops of the New York City Railway Company, at 146th Street and Lenox Avenue, has accepted a position with the engineering department of the Westinghouse Electric & Manufacturing Company.

MR. W. E. HARRINGTON, president of the Pottsville Union Traction Company, of Pottsville, Pa., has been relieved

of much routine work by the appointment of Mr. J. T. Mooney, chief of the construction department, to the position of assistant manager of transportation, and Mr. H. O. Ellis as chief of construction.

MR. ALLEN JONES has been appointed superintendent of transportation of the municipal street railway system at Monroe, La., vice Mr. B. L. Jakeway. Mr. Jones has been connected with the water, light and traction department for several years.

MR. EITURO SAKUMA, manager of the Tokio Street Railway, is on a tour of inspection in this country. He has visited New York, Chicago, Philadelphia and St. Louis, and last week was in Cleveland. The Tokio Street Railway has nearly 200 miles of trackage, and this will be increased by 300 miles. Mr. Sakuma expects to study the street railway situation in Cleveland for a week. He will then return to Japan.

MR. M. NAMBA, professor of electrical engineering at the University of Kyoto, Japan, is making a short visit in this country, during which he will inspect a number of the more interesting installations and manufacturing establishments. Prof. Namba is also electrical engineer of the municipality of Kyoto, which will shortly increase the capacity of its electrical generating plant from 2000 hp to 7000 hp, and extend its street railway system.

MR. CHARLES JONES, chief engineer of the Aurora, Elgin & Chicago Railway, presented a paper at the meeting of the Armour Institute Branch of the American Institute Electrical Engineers on March 8. The address was one of exceptional interest, and was on the subject, "Some Experiences in Electric Railway Building." Mr. Jones gave a detailed account of the work of the construction engineer to the ninety members and visitors present.

MR. JOHN A. BEELER, vice-president and general manager of the Denver City Tramway Company, contributed an interesting article in a recent issue of "Public Service" on the "Five-Cent Fare." A comparison is made between the advantages of the uniform fare as employed in America and the zone system of fares common in Europe, the wages and taxes paid by the different companies and other points. The article is reprinted in the "Western Tramway Employees' Journal," of Denver.

MR. F. D. HOFFMAN has been elected treasurer of the Chicago City Railway Company to succeed Mr. J. P. Burke, who has been elected assistant treasurer. Mr. Hoffman gained his first street railway experience in Milwaukee in the employ of the Milwaukee Electric Railway & Light Company, whose service he entered in 1898. Later he became secretary to Mr. Thomas E. Mitten, the president of the Chicago City Company, when Mr. Mitten was superintendent of the Milwaukee Company, and accompanied Mr. Mitten to Buffalo at the time of the Pan-American Exposition. In 1905 he became secretary to President Pierce, of the International Railway Company, of Buffalo, and in February, 1906, was made assistant secretary and treasurer of the Chicago City Railway.

MR. ORAL A. STEVENS has resigned as division superintendent of the Boston & Northern Street Railway Company, and Mr. W. E. Maloney has been elected as his successor, who for the past five years has held the office of superintendent of the Manchester Street Railway Company. Mr. Maloney began his career at 18 years of age in the offices of the Worcester Consolidated Company. For twelve years he remained with that company, working up until he had reached an important position in its management. From Worcester, Mr. Maloney was called to the superintendency of the Manchester Street Railway Company, which position he has filled with ability for the last five years.

MR. CHARLES H. ARMATAGE has been appointed traffic manager of the United Traction Company, of Albany, N. Y., and its subsidiary lines. This is a new position, and Mr. Armatage will have charge of the passenger and freight business, and his jurisdiction will extend over the United Traction, the Hudson Valley and Forest Park lines. Mr. Armatage has been connected with the United Traction Company for about six months as superintendent of the express department. He is a former railroad man, and was at one time a conductor on the West Shore Railroad. He was also on the Lebanon Springs Railroad. He was also connected with the Traction Company a few years ago but left, and then again entered the service of the company about six months ago.